



# BONAI INDUSTRIAL COMPANY LIMITED

Registered Office : MAIN ROAD, BARBIL - 758 035, DIST. - KENDUJHAR, ODISHA, INDIA

Telefax : 06767 - 275481, E-mail : bbloffice@bonaiindustrial.com

CIN - U14109OR1939PLC000246

BICO/ED/GEO/2018-19/638

Dated 24.11.2018

To  
The Director  
IA Division (Non Coal Mining)  
Vayu-305, Indira Paryavaran Bhavan,  
Ministry of Environment, Forests & Climate Change,  
Jorbagh Road, Lodhi Road,  
New Delhi-110 003

**Sub:** Submission of information/documents sought for in respect of Nadidih Iron & Manganese Mine of M/s Bonai Industrial Co. Ltd. located in villages - Nadikasira and Rengalbeda, Tehsil - Koira, Dist. Sundargarh, Odisha.

**Ref.:** Minutes of 38<sup>th</sup> EAC meeting held in November 16<sup>th</sup>, 2018 downloaded from MoEF&CC website (File No. J-11015/135/2012-IA.II(M); Proposal No. IA/OR/MIN/83339/2012) Agenda Item no. 2.29.

Sir,

With reference to the subject cited above we are hereby submitting the requisite information/document of the project as follows:

S. No.	Query Raised	Reply
i.	The Committee observed that the mine lease is valid only up to 31.03.2020 and the PP has proposed the Expansion of production of Iron Ore from 5.3 million TPA (4.3 MTPA ROM Iron Ore+ 1.0 MTPA of low grade iron ore from old dump within lease area) to 9.0 million TPA (8.0 MTPA ROM+1.0 MTPA of low grade iron ore from old dump within lease area). The Committee observed that the time for expiry of the mining lease is very less and PP needs to submit the time required for achieving the peak production after obtaining clearance from the Ministry because there are other statutory clearances such as CTO etc. needs to be obtained before mining for the expanded capacity. In addition to this PP needs to submit the month wise production plan (eg. Month 1, Month 2....) for proposed production capacity of Ore.	Project proponent will achieve peak production from month of February, 2019 after getting EC and other statutory clearances. Month wise production plan for proposed production of iron ore is enclosed as Annexure -I.
ii.	Project Proponent reported that the baseline data have been carried out during summer season (March to May 2018). The predicted incremental concentration for PM <sub>10</sub> is NIL to 3.29388µg/m <sup>3</sup> , for PM <sub>2.5</sub> the incremental concentration is from NIL to	Air Quality modeling with incremental ground level concentration including SO <sub>2</sub> due to mining and allied activities along with

Contd. P/2 ...



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	<p>1.02569<math>\mu\text{g}/\text{m}^3</math>, and for <math>\text{NO}_2</math> the incremental concentration is from NIL to 0.00425 <math>\mu\text{g}/\text{m}^3</math>. <b>PP has not predicted the incremental concentration for <math>\text{SO}_2</math> parameter. The Committee is of the view that the proposed production of mine is almost twice; however, the predicted incremental concentration for the parameters are very less and suggested that PP needs to re-calculate the prediction for all the parameters including <math>\text{SO}_2</math> and submit before the EAC for further deliberations. In view of the above PP needs to redo the modeling and submit the details with inputs on Air Quality modeling along with incremental ground level concentration due to mining and allied activities along with ore transportation on account of additional vehicles.</b></p>	<p>ore transportation on account of additional vehicles is attached as Annexure - II.</p>
iii.	<p>The Committee has deliberated the point wise compliance of Environmental Clearance submitted by the Regional Office of the Ministry. The report inter- alia mentioned that the project authority has complied or are in process of complying with the conditions stipulated by the Ministry. <b>The PP was requested to submit the digital processing of entire lease area report within stipulated time period. As digital Processing of entire lease area is conducted once in three years. The Committee deliberated the issues raised by the Regional Office Bhubaneswar and is of the view that PP needs to submit the actions made by the PP after inspection/action plan on the issues flagged by the RO.</b></p>	<p>In compliance to the issue flagged by the RO in respect of compliance of Environmental Clearance for submission of digital processing map/report , the project proponent has already submitted the said map/report to the Regional Office of MoEF &amp;CC at Bhubaneswar vide letter no. BICo/ED/GEO/2018-19/105 dt. 11.05.2018. Copy enclosed as Annexure - III.</p>
iv.	<p>The Committee observed that as per the recommendations of NEERI report the State Government has to complete the SOTM within 5 years and as the EC capacity is 9 Million TPA, therefore, SOTM 1 may be applicable to this project and the Ore transport mode should be 100% by private railway siding or conveyor belt up to public railway siding or pipeline for captive mines and 70 % for non-captive mines. In this context PP submitted that It is not feasible to construct conveyor belt system for transport of iron ore from the mine to different Railway sidings due to problem in acquisition of private (including ST land), involvement of forest land, involvement of huge expenditures on this account as well as less availability of time since the mining lease period is valid up to 31.03.2020 only. The</p>	<p>The expansion of the mine is coming under SOTM I. Project proponent has requested the State Govt. of Odisha for obtaining information on the initiatives taken by them in this regard. Copy of the letter is annexed as Annexure - IV. We are pursuing the matter with the State Govt. and will submit the details immediately after obtaining the required information.</p>



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	Committee ask the PP to submit the development on the SOTM, if any, made by the Government of Odisha.	
v.	The Occupational Health Surveillance report needs to be submitted by the PP.	The Occupational Health Surveillance Report is attached as Annexure -V.
vi.	The PP needs to implement the recommendations of the report of carrying capacity study and necessary arrangement to be made to arrest "zero dust re-suspension".	Mine Management will make necessary arrangement to arrest "zero dust re-suspension" within three months. An undertaking regarding the same is enclosed as Annexure - VI.
vii.	The Committee observed that as per the recommendations of NEERI report and its TOR condition no. 6, the PP needs to construct cement concrete road from mine entrance and exit to the main road with proper drainage system and green belt development within one year. PP informed that it is not feasible at this stage as the mining lease period will expire on 31.03.2020 to construct cement concrete roads from the exit point of the mine to the main road since it involves considerable expenditure as well as the time required to obtain the approval for use of forest land for the said purpose. The Committee deliberated the issues and is of the view that PP needs to submit action plan on the recommendations of the carrying capacity study.	Project proponent will construct cement concrete road from mine entrance and exit to the main road NH 215 with drainage system and green belt within one year. An Undertaking in this regard is enclosed as Annexure - VII.
viii.	PP needs to submit the details of financial Assurance in the form Bank Guarantee during approval of Review of the Mining Plan for implementation of FMCP under Rule-24 of Mineral Conservation and Development Rules, 2017.	Financial Assurance in the form of Bank Guarantee for an amount of Rs. 2,21,56,500/- only for entire mining lease area over 73.855 ha @ Rs. 3,00,000/- per hectare (BG of Rs. 2,03,10,125/- on dt. 19.05.2017 & BG of Rs. 18,46,375/- on dt. 02.04.2013) has been submitted to Indian Bureau of Mines for implementation of FMCP under Rule-24 of Mineral Conservation and Development Rules, 2017.



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		Copy enclosed as Annexure -VIII.
ix.	The report inter-alia includes the presence of two schedule-I species namely Peacock & Python. PP needs to submit the species specific conservation plan for Schedule-I species along with the budgetary provisions.	Species Specific Conservation Plan for Schedule - I species namely Peacock & Python is attached as Annexure - IX.
x.	Details of application made to CGWA for approval of intersection of ground water needs to be submitted.	Details of application made to CGWA for approval of intersection of ground water is enclosed as Annexure - X.
xi.	The PP needs to submit how the they will reduce the water consumption over the years. Target for rain-water harvesting and reduction in water use needs to be explored and submitted.	Details of water conservation measures and measures to reduce water consumption is enclosed as Annexure - XI.
xii.	PP needs to submit the details of the activities and budget earmarked for Corporate Environmental Responsibility (CER) which shall be as per Ministry's O.M No 22- 65/2017-IA. II (M) dated 01.05.2018 and its action plan on the activities proposed under CER.	Details of activities with budgetary allocations for Corporate Environmental Responsibility (CER) is annexed as Annexure - XII.
xiii.	PP needs to resubmit the action plans on the recommendations of the report of carrying capacity study.	Action plan on the recommendations of the report of carrying capacity is enclosed as Annexure - XIII.

We would request your good self to kindly consider the above for grant of Environment Clearance for the said expansion at the earliest.

Thanking you,

Yours faithfully,

For Bonai Industrial Co. Ltd.

  
Director

Encl: As above

**NADIDIH IRON & Mn MINE**  
**OF M/s Bonai Industrial Co.Ltd**

**ANNEXURE -I**

**Table 1**

**Proposed tentative insitu excavation details in Metric Ton (MT) indicating development, ROM, pitwise for the year 2019-20**

Type (Year)	Pit no.	Total tentative excavation (MT)**	Waste (MT)	ROM (45% Fe & above) (MT)		Total ROM (MT)
				Ore (MT) (+55%)	Mineral Reject (MT) (45-55%)	
2019-20	Top-2 Pit & Boundary Pit	1,08,79,025	28,79,025	72,00,000	8,00,000	80,00,000

**Table 2**

**Details of tentative re-handling proposal of old dumps (in MT)**

Year	Dump No	Year-wise handling (MT)	Waste (MT)	ore (MT)
2019-20	Dump-A	10,00,000	6,00,000	4,00,000

**Table 3**

**Total Material handling in MT**

Year	Tentative material handling (MT)	Total waste (MT)	Total ore (MT)
2019-20	1,18,79,025	34,79,025	84,00,000

\*\*The approx. bulk density is 3.0 T/m<sup>3</sup> for insitu Iron ore & 2.5 T/m<sup>3</sup> for waste excavation.

**NADIDIH IRON & Mn MINE**  
**OF M/s Bonai Industrial Co.Ltd**

**Annexure-1 Contd..**

**Table.1**

**Tentative proposed monthly excavation, production(in MT) from ROM & waste generation for the year 2019-20**

Month /Year	Excavation from mine pit		OB/IB/SB generation (in MT)	Rehandling from waste Dump-A		Total ore (MT)	Total waste (in MT)	Tentative material handling (in MT)
	Total Excavation (in MT)	Ore production (in MT)		Total Rehandling (in MT)	Ore production (in MT)			
1	2	3	4	5	6	8(3+6)	9(4+7)	10(2+5)
April'2019	989002	727273	261729	90909	36363	763636	316275	1079911
May'2019	989002	727273	261729	90909	36363	763636	316275	1079911
June'2019	989002	727273	261729	90909	36363	763636	316275	1079911
July'2019	989002	727273	261729	90909	36363	763636	316275	1079911
August'2019	989002	727273	261729	90910	36364	763637	316275	1079912
September'2019	989003	727273	261730	90909	36364	763637	316275	1079912
October'2019	989003	727273	261730	90909	36364	763637	316275	1079912
November'2019	989003	727272	261730	90909	36364	763636	316275	1079911
December'2019	989002	727272	261730	90909	36364	763636	316275	1079911
January '2020	989002	727272	261730	90909	36364	763636	316275	1079911
February'2020	989002	727272	261730	90909	36364	763636	316275	1079911
<b>Total (2019-20)</b>	<b>1,08,79,025</b>	<b>80,00,000</b>	<b>28,79,025</b>	<b>10,00,000</b>	<b>4,00,000</b>	<b>84,00,000</b>	<b>34,79,025</b>	<b>11879025</b>

## AIR QUALITY PREDICTIONS THROUGH MATHEMATICAL MODELLING FOR

### Nadidhi Iron and Mn. Mine of BICO

#### 1.0 PREAMBLE

Impact assessment is an important part of Environmental Impact Assessment Study. There are various techniques available to predict the impacts. Mathematical modelling is an established and accepted technique to predict the impacts. The open cast mines are potential sources of air pollution.

In this section impact on air environment due to emissions generated due to increase in production capacity of mine, handling of ore and waste for Nadidhi BICO. Concentrations have been predicted by mathematical modelling.

#### 2.0 EMISSION SOURCE and Emission Rates

#### 2.1 EMISSION RATES

##### A) Dust

Dust emission rate due to material handling in mining area is assessed based on the following empirical formula (source: IMEJ-April 1982).

a) Dust emission due to excavation:

$$\text{Dust emission (DE)} = \frac{\text{Pa} \times 23.6}{\text{Wd} \times \text{Wh} \times 1000}$$

DE = Dust emission in kg/hr

Pa = Annual Excavation in tonnes

Wd = No. of days of operation in a year

Wh = Effective working hrs in a day

Quantity of dust emitted in kg for 1000 tonnes of excavation.

##### A. Iron Ore Handling

Annual increase in Total Excavation is 5.58 MTPA. The dust emission due to handling of this ore and OB will be 10.16 g/s.

Similarly dust emission due to transportation (835 trips shall be involved) will be 18.09 g/sec.

Total dust emission = 28.25 g/sec.

Since PM<sub>10</sub> has been considered it is one third of SPM and after controlled factor this will be 9.41 g/sec.

### C. Emission Rates from Dust Extraction System and DG Sets

The emission rates from DG sets and dust extraction system are summarized below:

Details Description	DG Set Stack				
	1	2	3	4	5
	10 KVA	140 KVA	1260 KVA	1260 KVA	1260 KVA
Material Construction	Mild Steel				
Stack Top	Circular				
Release Height above Ground:	1.5m	3.0m	6m	6m	6m
Inside Diameter	0.0635 m	0.1016 m	0.1524 m	0.1524 m	0.1524 m
Emission Rate(g/s)for PM:	0.000680	0.0024	0.013	0.013	0.013
Emission Rate for NO <sub>2</sub> (g/s)	0.041	0.034	0.030	0.030	0.030
Emission Rate for SO <sub>2</sub> (g/s)	0.010	0.010	0.010	0.013	0.045
Stack Gas Exit Temperature in Kelvin:	381	423	464	464	464
Stack Gas Exit Velocity(m/s):	9.50	10.89	11.69	11.69	11.69

## 2.2 EMISSION SOURCE COORDINATES

The center of mine was assumed (0, 0) in the mathematical modelling.

### 3.0 MATHEMATICAL MODEL FOR POLLUTANTS DISPERSION

In the present case ISCST (Industrial Source Complex-Short Term ISC-3) model has been used to predict the impacts. This ISC model for area sources uses the steady state Gaussian plume equation for a continuous source.

Further the model has following specialties:

- Simulates dispersion from single/multiple/area/line/volume sources.
- Allows calculations to be made at a user specified regular rectangular/radial grid or at specified special receptors.
- Provides estimates of concentrations for any averaging time period for the entire period of input meteorology.
- Allows calculations to be underwritten for source groups as selected by the user.
- Uses Pasquill-Gifford or Briggs dispersion curves (for urban areas) as selected by the user, to derive the plume spread parameters.
- Adjusts dispersion curves to account for user specified information on aerodynamic roughness.
- Adjusts for wind speed variation with height, using user specified default urban/rural power law coefficients.
- Simulates dispersion from buoyant, non-buoyant point sources, non-buoyant area, non-buoyant volume sources and non-buoyant line sources.
- Simulates dry deposition using a simple tilted plume model with user specified reflection coefficients.
- Simulates building wake effects.
- Can include the effects of exponential decay.
- Uses Briggs' 1975 plume rise algorithm to calculate plume height.

The ground level concentration at a receptor located downwind of all or a portion of the source area is given by a double integral in the upwind (x) and crosswind (y) directions as:

$$x = \frac{Q_A K}{2\pi U_s} \int_x^{\infty} \frac{VD}{\sigma_y \sigma_z} \int_y^{\infty} \exp \left[ -0.5 \left[ \frac{y}{\sigma_y} \right]^2 \right] dy \quad dx \quad (2)$$

where,

- $Q_A$  = Area source emission rate (mass per unit area per unit time)  
 $K$  = units scaling coefficient  
 $V$  = Vertical term.  
 $D$  = Decay term as a function of  $x$   
 $\sigma_y, \sigma_z$  = standard deviation of lateral and vertical concentration distribution (m)  
 $U_s$  = mean wind speed at release height

### 3.1 VERTICAL TERM

The vertical term includes the effects of source elevation, receptor elevation, plume rise, limited mixing in vertical and gravitational settling and dry deposition of particulates (with diameters greater than about 0.1 micron).

In the present case effects on ambient air concentrations due to gravitational settling and dry deposition have been neglected. The vertical term without deposition effects is given by:

$$V = (1 + \gamma) \left[ \exp \left[ - \frac{H_e^2}{2\sigma_z^2} \right] + \sum_{i=1}^{\infty} \gamma^{i-1} \exp \left[ - \frac{(2i H_m - H_e)^2}{2\sigma_z^2} \right] + \exp \left[ - \frac{(2i H_m + H_e)^2}{2\sigma_z^2} \right] \right] \quad (3)$$

where,

- $H$  = effective release height of emissions (plume rise + physical stack height)  
 $H_m$  = Mixing height  
 $\gamma$  = reflection coefficient

The infinite series term in equation accounts for the effects of restrictions on vertical plume growth at the top of mixing layer. Complete reflection from earth surface has been assumed ( $\gamma = 1$ ). For number of sources more than one simulation is done for each individual source and then added. In order to calculate  $\sigma_y$  and  $\sigma_z$  for various receptor points for given wind direction following equations are used.

$$x = - (X(R) - X(S)) \sin (WD) - (Y(R) - Y(S)) \cos (WD) \quad (4)$$

$$y = (X(R) - X(S)) \cos (WD) - (Y(R) - Y(S)) \sin (WD) \quad (5)$$

where  $X(R)$ ,  $Y(R)$  are receptor point coordinates and  $X(S)$  and  $Y(S)$  are source coordinates and  $WD$  is wind angle from north.

### 3.2 DISPERSION COEFFICIENTS

Equations that approximately fit the Pasquill-Gifford curves (Turner, 1970) are used to calculate  $\sigma_y$  and  $\sigma_z$  in meters for rural area. The equations used to calculate  $\sigma_y$  are of the form

$$\sigma_y = 465.11628 (x) \tan (TH) \quad (6)$$

where,

$$TH = 0.017453293 [c-d \ln (x)] \quad (7)$$

In the above equations down wind distance 'x' is in kilometers and coefficients 'c' and 'd' are listed in **Table 2**. The equation used to calculate  $\sigma_z$  is of the form:

$$\sigma_y = ax^b \quad (8)$$

**TABLE 2**  
**COEFFICIENTS USED TO CALCULATE LATERAL VIRTUAL DISTANCES**

$\sigma_y = \frac{\sigma_{y0}^{1/q}}{P}$		
Pasquill Stability Category	P	q
A	209.14	0.890
B	154.46	0.902
C	103.26	0.917
D	68.26	0.919
E	51.06	0.921
F	39.92	0.919

where down wind distance x is in kilometers and  $\sigma_z$  is in meters. The coefficients 'a' and 'b' are given in **Table 3**.

**TABLE 3****PARAMETERS USED TO CALCULATE PASQUILL-GIFFORD VERTICAL DISPERSION COEFFICIENT ( $\sigma_z$ )**

$\sigma_z$ (meters) = $ax^b$ (x in km)			
Pasquill Stability Category	x (km)	a	b
A*	<.10	122.800	0.94470
	0.10 - 0.15	158.080	1.05420
	0.16 - 0.20	170.220	1.09320
	0.21 - 0.25	179.520	1.12620
	0.26 - 0.30	217.410	1.26440
	0.31 - 0.40	258.890	1.40940
	0.41 - 0.50	346.750	1.72830
	0.51 - 3.11	453.850	2.11660
	>3.11	**	**
B*	<.20	90.673	0.93198
	0.21 - 0.40	98.483	0.98332
	>0.40	109.300	1.09710
C*	All	61.141	0.91465
D	<.30	34.459	0.86974
	0.31 - 1.00	32.093	0.81066
	1.01 - 3.00	32.093	0.64403
	3.01 - 10.00	33.504	0.60486
	10.01 - 30.00	36.650	0.56589
	>30.00	44.053	0.51179

**TABLE 3 (CONTD.)**

$\sigma_z$ (meters) = $ax^b$ (x in km)			
Pasquill Stability Category	x (km)	A	b
E	<.10	24.260	0.83660
	0.10 - 0.30	23.331	0.81956
	0.31 - 1.00	21.628	0.75660
	1.01 - 2.00	21.628	0.63077
	2.01 - 4.00	22.534	0.57154
	4.01 - 10.00	24.703	0.50527
	10.01 - 20.00	26.970	0.46713
	20.01 - 40.00	35.420	0.37615
	>40.00	47.618	0.29592
F	<.20	15.209	0.81558
	0.21 - 0.70	14.457	0.78407
	0.71 - 1.00	13.953	1.68465
	1.01 - 2.00	13.953	0.63227
	2.01 - 3.00	14.823	0.54503
	3.01 - 7.00	16.187	0.46490
	7.01 - 15.00	17.836	0.41507
	15.01 - 30.00	22.651	0.32681
	30.01 - 60.00	27.074	0.27496
	>60.00	34.219	0.21716

\* If the calculated value of  $\sigma_z$  exceed 5000 m,  $\sigma_z$  is set to 5000 m.

\*\*  $\sigma_z$  is equal to 5000 m.

### 3.3 METEOROLOGICAL CONDITIONS USED IN PREDICTIONS

The hourly meteorological data has been generated at the site and the same has been used in the predictions. The hourly wind speed, temperature, direction and stabilities have been used. The hourly data was available for the months of March-May,2018.

### 3.4 ATMOSPHERIC STABILITY

Many alternative models are developed by different authors to relate  $\sigma_y$  and  $\sigma_z$  with down wind distance x under different atmospheric stability conditions. Unfortunately none of these have been found to be comprehensive enough to be applicable under all types of topographic and meteorological conditions. On the basis of available information, “Pasquill Gifford” stability classification system for study area has been followed. This classification is built in the model.

The Pasquill Gifford stability classification divides atmospheric stability into six classes based on solar insolation/cloud cover conditions. Details of this classification are given **Table 4.**

**TABLE 4**  
**PASQUILL - GIFFORD STABILITY CLASSIFICATION**

Surface wind speed (m/s)	Day time insolation			Night time conditions	
	Strong	Moderate	Slight	Thin low clouds <4/8	Overcast clouds >3/8
0 - 2	A	A - B	B	E	F
2 - 3	A - B	B	C	E	F
3 - 5	B	B - C	D	D	E
5 - 6	C	C - D	D	D	D
>6	C	D	D	D	D

A - Extremely unstable

B - Moderately unstable

C - Slightly unstable

D - Neutral

E - Slightly stable

F - Moderately stable

### 3.5 Plume Rise

Plume rise  $\Delta h$  has been determined according to Brigg's formula (CPCB **guideline**)

$$\Delta h = 21.425 \frac{F^{3.4}}{U_s} \quad \text{for } F < 55$$

and

$$\Delta h = 38.71 \frac{F^{3.5}}{U_s} \quad \text{for } F > 55$$

$$F = g V_s D^2 (T_s - T_a) / 4 T_s$$

Where

$U_s$  = wind speed at stack level (m/s)

$V_s$  = stack gas velocity (m/s)

$T_s$  = stack gas temperature ( $^{\circ}\text{K}$ )

$T_a$  = ambient temperature ( $^{\circ}\text{K}$ )

$F$  = Buoyancy flux parameter ( $\text{m}^4/\text{s}^3$ )

$\Delta h$  = Plume rise (m)

$D$  = Diameter of the stack (m)

$g$  = acceleration due to gravity, 9.807 ( $\text{m}/\text{s}^2$ )

### 3.6 Extrapolation of Wind Speed

Wind speed at stack level is calculated by power law as given below.

$$U_{\text{stack}} = U_{10} (\text{Stack height}/10)^p$$

Where  $U_{10}$  is the wind speed at 10 meter level and  $p$  is the power law coefficient (0.07, 0.07, 0.10, 0.15, 0.35 and 0.55 for stability classes A,B,C,D,E and F respectively) as per Irwin for rural areas (USEPA, 1987).

### 3.7 AMBIENT AIR QUALITY AND BACKGROUND CONCENTRATIONS

Ambient air quality standards promulgated by Central Pollution Control Board (CPCB) for different areas are as follows:

Concentration ( $\mu\text{g}/\text{m}^3$ )			
PM10	PM2.5	SO <sub>2</sub>	NO <sub>2</sub>
100	60	80	80

The above standards are for a sampling period of 24 hours. The maximum concentration of pollutants (PM10, PM2.5, SO<sub>2</sub> and NO<sub>2</sub>) recorded at habitat in the study area during summer months are given below:

Station Code	Location	Maximum Concentration in $\mu\text{g}/\text{m}^3$			
		PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>2</sub>
A-1	Office Area	82.05	49.97	13.72	21.86
A-2	Within Mine lease	86.30	55.83	16.16	28.07
A-3	Arjunamunda Basti	79.11	50.88	10.73	17.91
A-4	Kendudihi	81.47	50.22	13.25	22.18
A-5	Gharburharni	74.18	46.78	10.74	22.35
A-6	Badipada	65.89	44.78	11.96	22.36
A-7	Jhirapani	69.11	46.25	11.69	24.05
A-8	Kashira	61.27	49.69	12.08	22.62

### 3.8 PLAN AND FRAME WORK OF COMPUTATIONS

#### 3.8.1 SELECTION OF LOCATIONS

The locations have been selected around the mining area covering an area of 10 km radius from mining center. The entire area has been put on grid network and grid spacing has been taken as 500 m.

#### 3.8.2 PLAN OF COMPUTATION

The emission rate, dispersion coefficients and other input data being now available it was planned to compute the following:

- The 24 hourly averaged incremental concentration with hourly data for the post monsoon season;
- The identification of grid point having peak concentration for the incremental values; and
- Preparation of isopleths.

### 3.9 RESULTS AND DISCUSSIONS

#### 3.9.1 PEAK 24 HOURLY INCREMENTAL CONCENTRATIONS

**Table 5: 24 hourly Peak Incremental Concentrations Computed**

S. No.	Season	Incremental Concentrations ( $\mu\text{g}/\text{m}^3$ )			
		PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>2</sub>	SO <sub>2</sub>
1	Summer	10.10823	3.10067	0.00255	0.85964

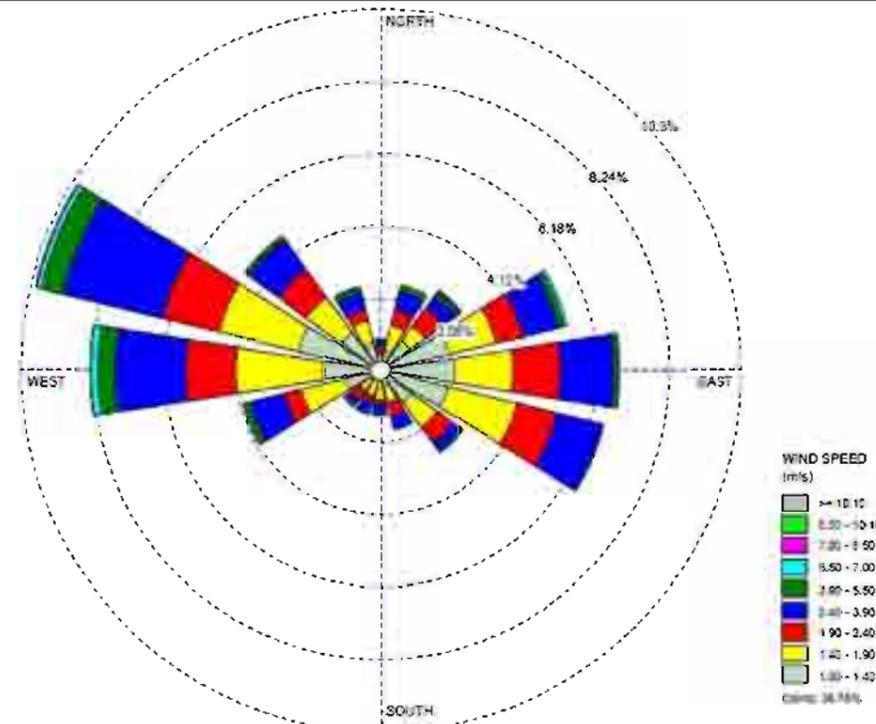
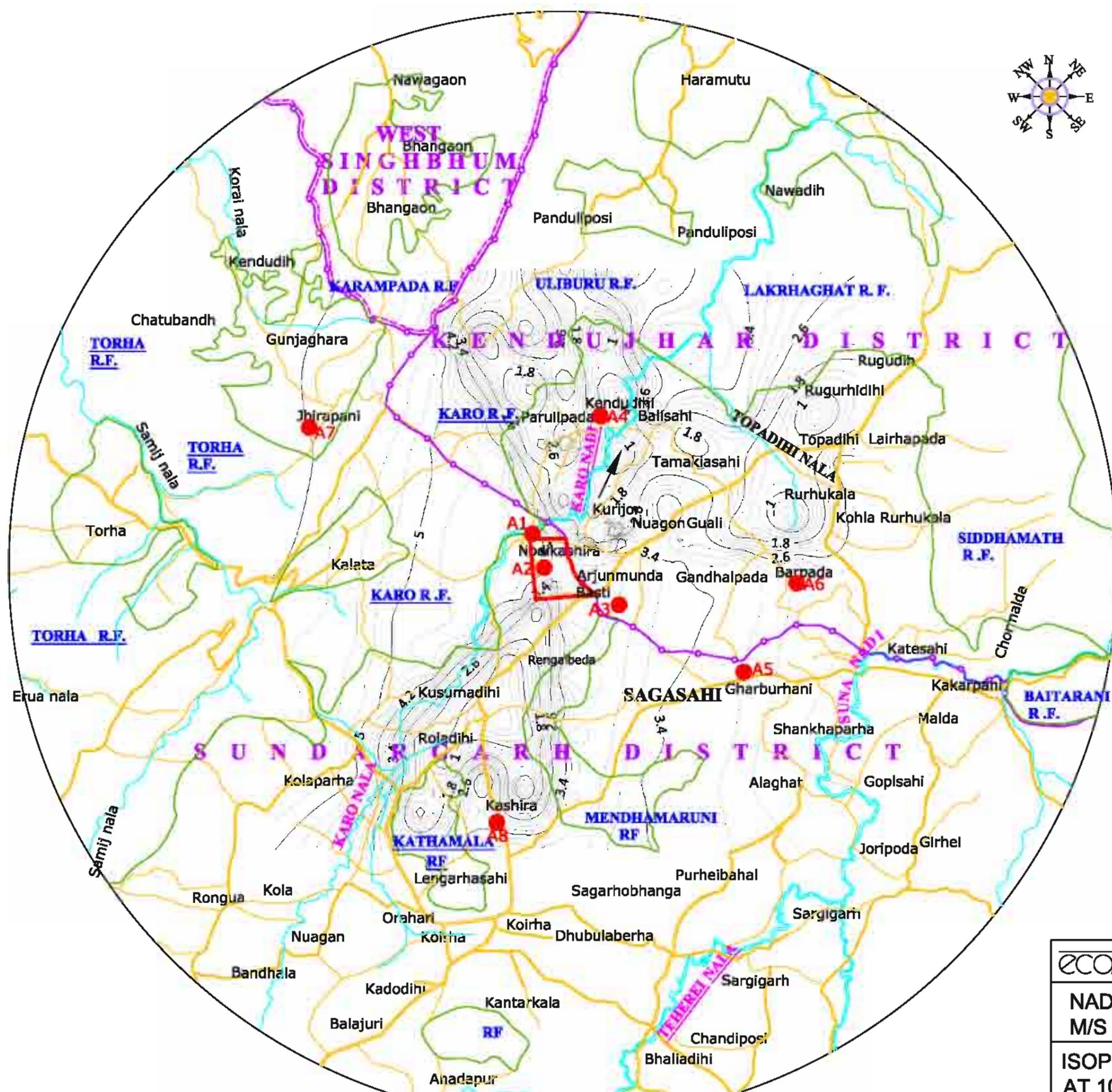
As mentioned above peak incremental 24 hourly PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub> and SO<sub>2</sub> concentrations have been computed using hourly meteorological data. The distances of occurrence of the peak concentrations of PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub> and SO<sub>2</sub> are 4900m (West), 4900m (West), 530m (North-West) and 490m (East) respectively. The isopleths of various concentrations have also been drawn for PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub> and SO<sub>2</sub> and shown in **Figures 1 to 4 respectively**. The incremental and predicted concentrations at the locations of ambient air quality have been discussed in the following section.

### 3.10 PREDICTED AMBIENT AIR QUALITY

With a wide fluctuation in meteorological parameters it is a complex task to predict post project ambient air quality. With available ambient air quality data and incremental concentrations computed through mathematical modelling the following post project ambient air quality has been predicted.

S. No.	Location	Background Concentration ( $\mu\text{g}/\text{m}^3$ )				Predicted Incremental Concentration ( $\mu\text{g}/\text{m}^3$ )				Post Project Concentration ( $\mu\text{g}/\text{m}^3$ )			
		PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>2</sub>	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>2</sub>	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>2</sub>	SO <sub>2</sub>
1	Arjuna munda Basti	82.05	49.97	21.86	10.73	7.3435	2.37244	0.00123	0.24709	89.3935	52.34244	21.86123	10.97709
2	Kendu dihi	86.30	55.83	28.07	13.25	4.46868	1.55687	0.00425	0.02699	90.76868	57.38687	28.07425	13.27699
3	Gharbu rharni	79.11	50.88	17.91	10.74	5.1994	2.19229	0.00256	0.00690	84.3094	53.07229	17.91256	10.7469
4	Badipa da	81.47	50.22	22.18	11.96	3.15272	1.04196	0.00100	0.00242	84.62272	51.26196	22.181	11.96242
5	Jhirapani	74.18	46.78	22.35	11.69	4.1658	1.07893	0.00121	0.00187	78.3458	47.85893	22.35121	11.69187
6	Kashira	65.89	44.78	22.36	12.08	2.9409	1.6618	0.00128	0.00767	68.8309	46.4418	22.36128	12.08767

It is clear from the predicted values that the concentrations of PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub> and SO<sub>2</sub> are well within the stipulated limits of CPCB for Rural and Residential areas at all locations.



- INDEX**
- LEASE BOUNDARY
  - ROAD
  - RIVER /NALA
  - RESERVED FOREST
  - STATE BOUNDARY
  - DISTRICT BOUNDARY
  - AIR QUALITY LOCATIONS

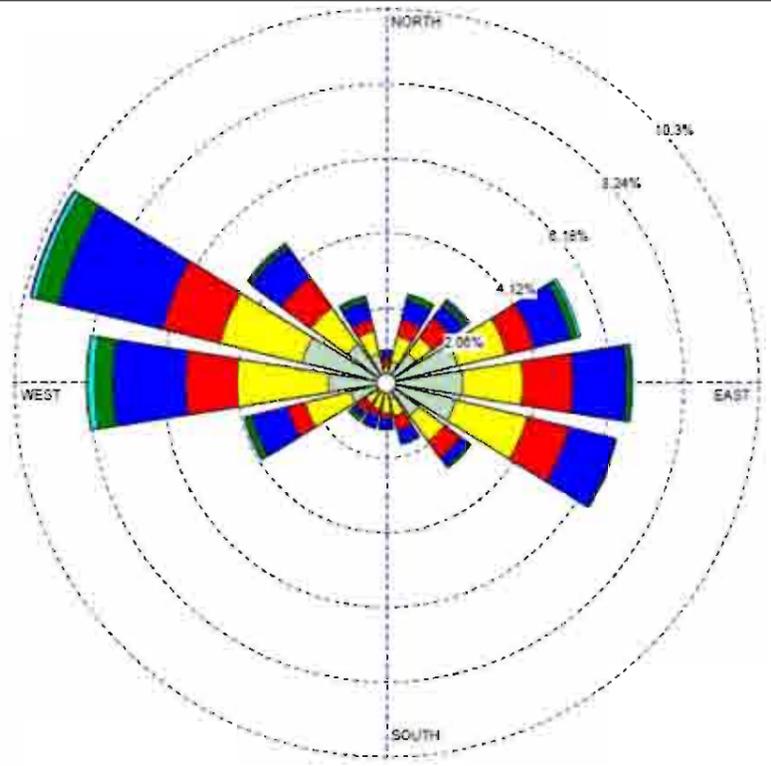
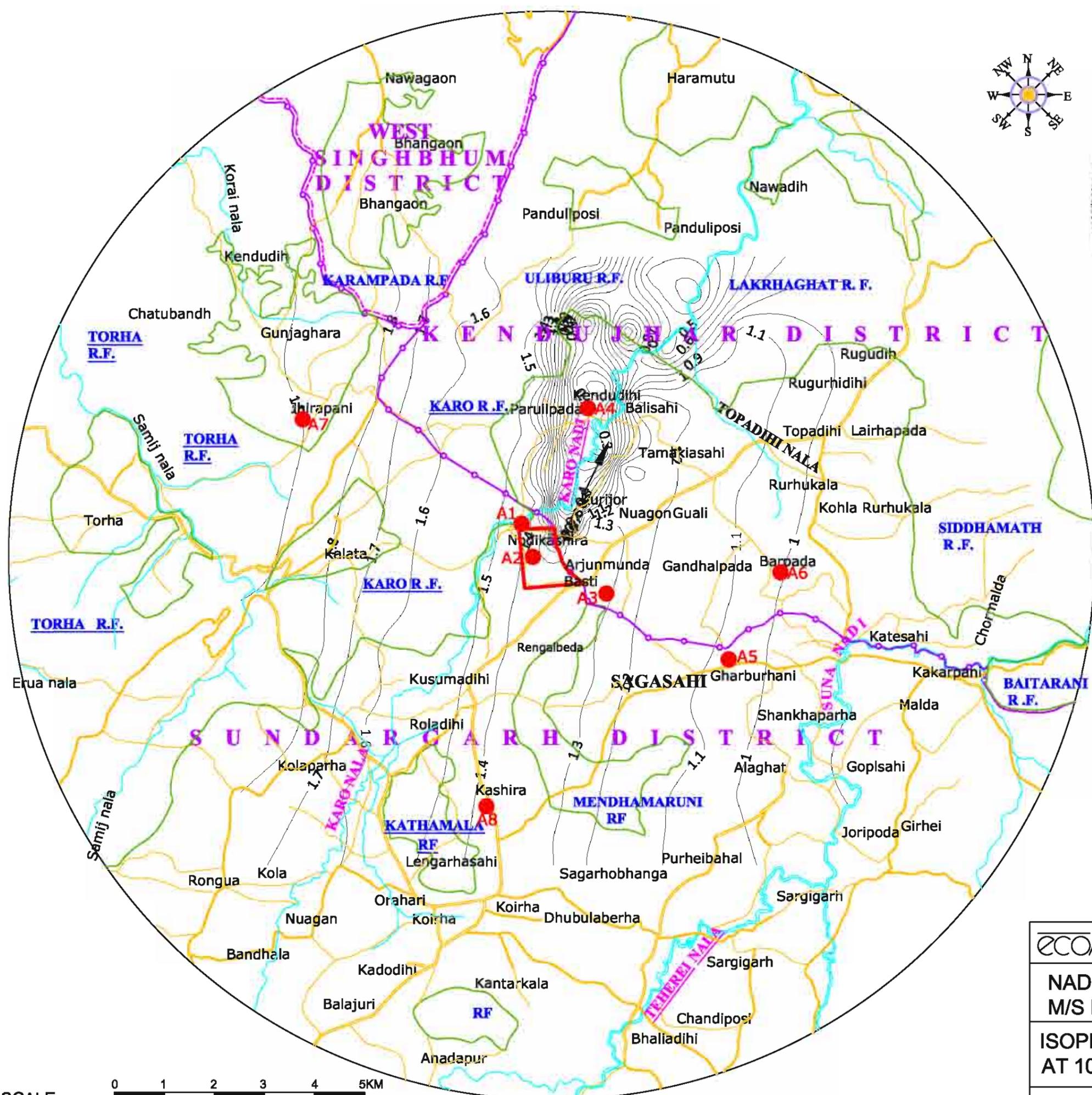


ecoMen LABORATORIES PVT. LTD., LUCKNOW

NADIDIH IRON & MN MINE  
M/S B.I.CO LTD.

ISOPLETH OF PM<sub>10</sub> SUPERIMPOSED  
AT 10 KM RADIUS MAP

FIGURE NO. :-1



**INDEX**

- LEASE BOUNDARY
- ROAD
- RIVER /NALA
- RESERVED FOREST
- STATE BOUNDARY
- DISTRICT BOUNDARY
- AIR QUALITY LOCATIONS

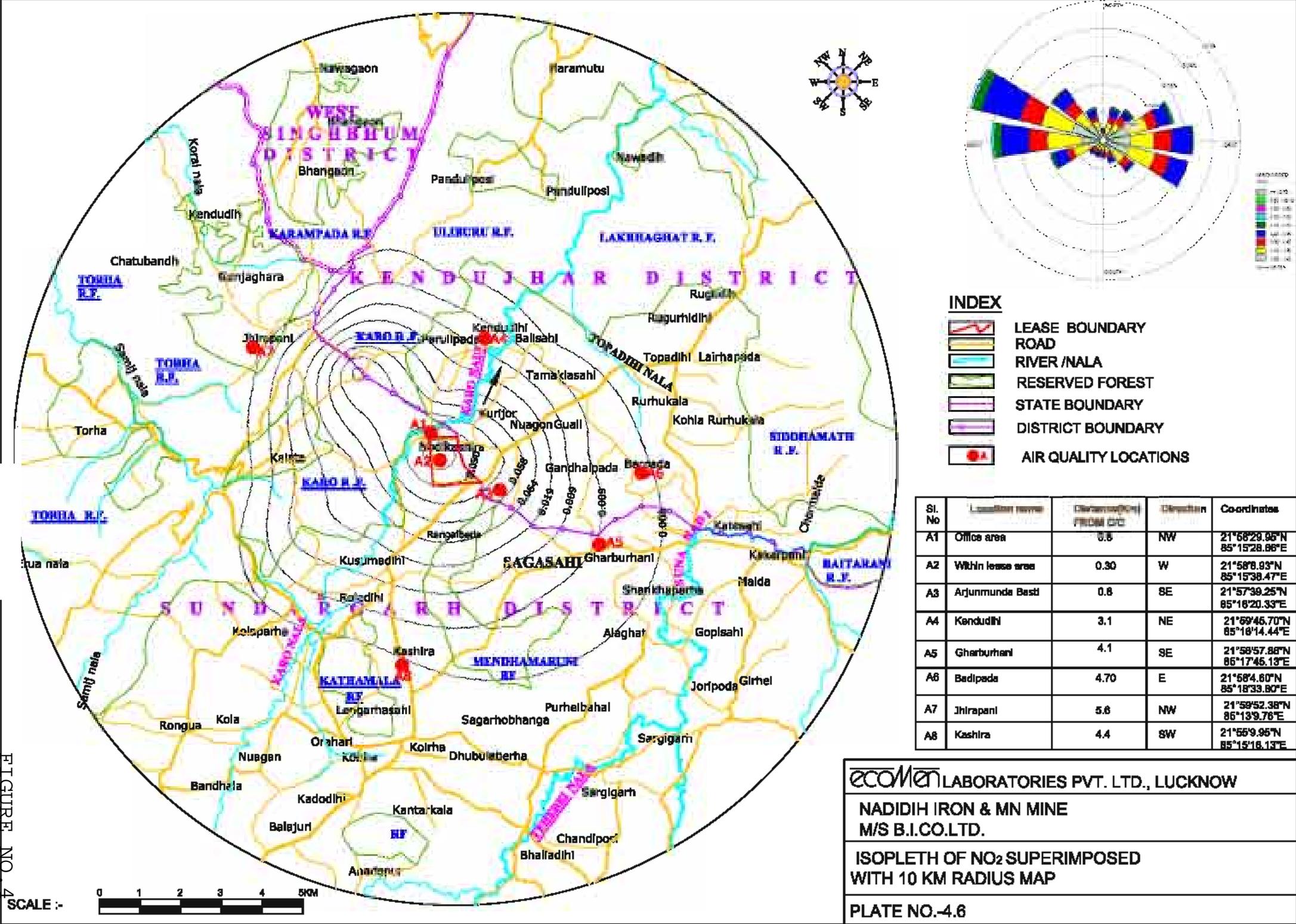


ecoMen LABORATORIES PVT. LTD., LUCKNOW

NADIDIH IRON & MN MINE  
M/S B.I.CO LTD.

ISOPLETH OF PM<sub>2.5</sub> SUPERIMPOSED  
AT 10 KM RADIUS MAP

FIGURE NO. :-2



**INDEX**

- LEASE BOUNDARY
- ROAD
- RIVER / NALA
- RESERVED FOREST
- STATE BOUNDARY
- DISTRICT BOUNDARY
- AIR QUALITY LOCATIONS

Sl. No	Location name	Distance (KM) FROM O/C	Direction	Coordinates
A1	Office area	0.5	NW	21°58'29.95"N 85°15'28.86"E
A2	Within lease area	0.30	W	21°58'8.93"N 85°15'38.47"E
A3	Arjunmunde Besti	0.8	SE	21°57'39.25"N 85°16'20.33"E
A4	Kendudih	3.1	NE	21°59'46.70"N 85°18'14.44"E
A5	Gharburhani	4.1	SE	21°58'57.88"N 85°17'46.13"E
A6	Badipada	4.70	E	21°58'4.80"N 85°18'33.80"E
A7	Jhirapani	5.8	NW	21°58'52.38"N 85°13'9.78"E
A8	Kashira	4.4	SW	21°56'9.96"N 85°15'16.13"E

**ecoMen** LABORATORIES PVT. LTD., LUCKNOW

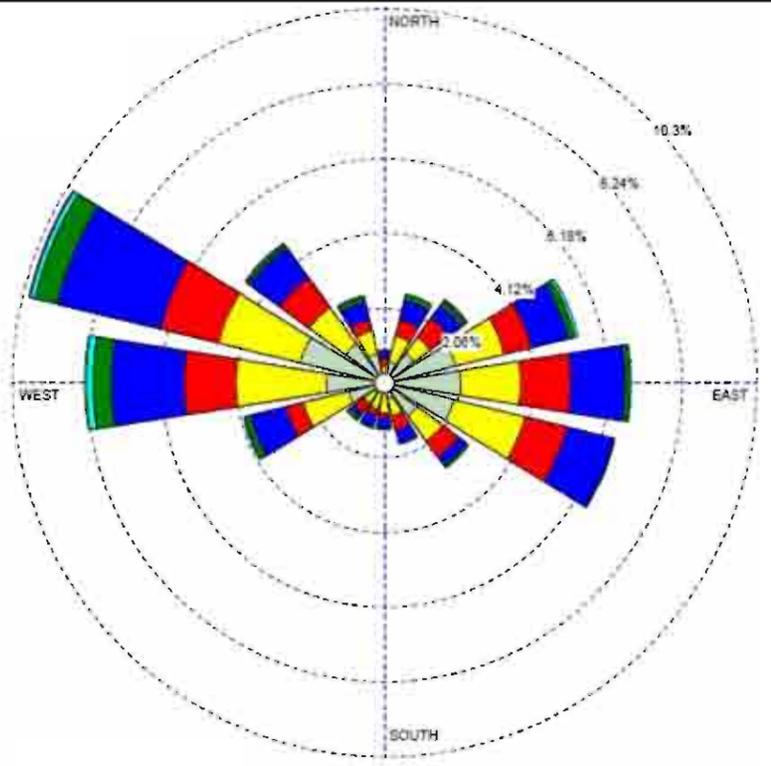
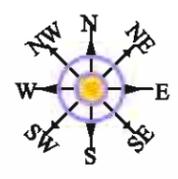
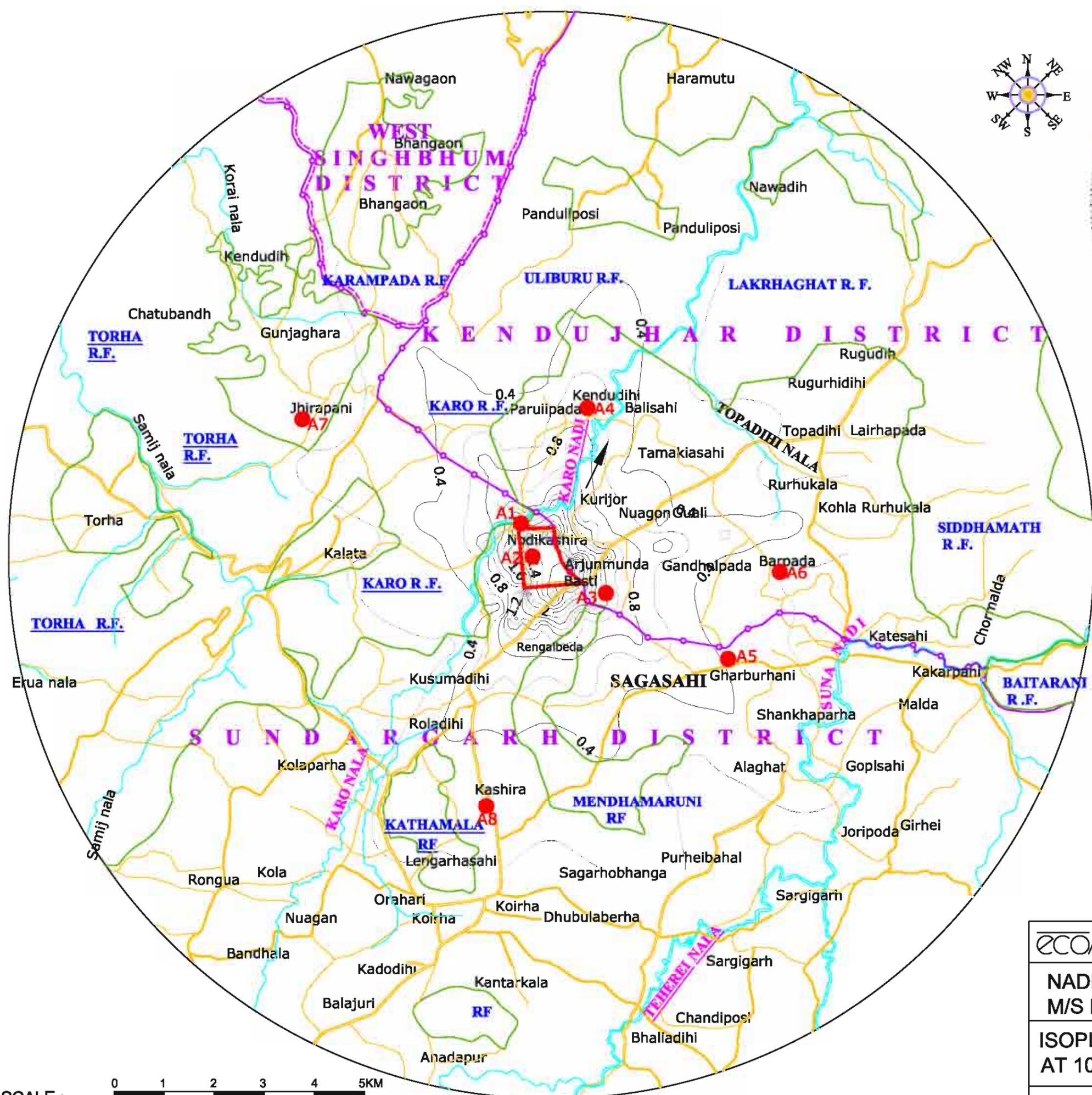
**NADIDIH IRON & MN MINE**  
M/S B.I.CO.LTD.

**ISOPLETH OF NO<sub>2</sub> SUPERIMPOSED WITH 10 KM RADIUS MAP**

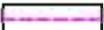
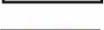
**PLATE NO.-4.6**

FIGURE NO. 4

SCALE :-



**INDEX**

-  LEASE BOUNDARY
-  ROAD
-  RIVER /NALA
-  RESERVED FOREST
-  STATE BOUNDARY
-  DISTRICT BOUNDARY
-  AIR QUALITY LOCATIONS



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NADIDIH IRON & MN MINE  
M/S B.I.CO LTD.

ISOPLETH OF SO<sub>2</sub> SUPERIMPOSED  
AT 10 KM RADIUS MAP

FIGURE NO. :-4



# BONAI INDUSTRIAL COMPANY LIMITED

Registered Office : MAIN ROAD, BARBIL - 758 035, DIST. - KENDUJHAR, ODISHA, INDIA

Telefax : 06767 - 275481, E-mail : bbloffice@bonaiindustrial.com

CIN - U14109OR1939PLC000246

o/c

**BICo/ED/GEO/2018-19/105**

**Dated: 11.05.2018**

To  
**The Joint Director,**  
 Government of India,  
 Ministry of Environment, Forest & Climate Change,  
 Eastern Regional Office,  
 A/3, Chandrasekharapur  
 Bhubaneswar - 751 023

**Sub: Submission of Digital processing map of the entire lease area using remote sensing technique of Nadidih Iron & Manganese Mines of M/s Bonai Industrial Co. Ltd.**

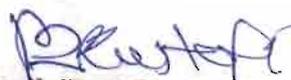
**Ref.: Specific Condition no. (xxix) of Environment Clearance order no. J-11015/135/2012-IA.II (M) dated 02.07.2015.**

Sir,

With reference to the subject cited above we are hereby submitting Digital processing map of the entire lease area using remote sensing technique in respect of Nadidih Iron & Manganese Mines in compliance of Specific Condition no. (xxix) of the EC order of the mine which was granted on 02.07.2015.

Thanking you.

**Yours faithfully,**  
**For Bonai Industrial Co. Ltd.**

  
**(Mahesh Dutt Rustagi)**  
**Director**

Encl. As above



o/c



# BONAI INDUSTRIAL COMPANY LIMITED

Registered Office : MAIN ROAD, BARBIL - 758 035, DIST - KENDUJHAR, ODISHA, INDIA

Telefax : 06767 - 275481, E-mail : bbloffice@bonaiindustrial.com

CIN - U14109OR1939PLC00246

BICo/ED/GEO/2018-19/ 631

Dated: 24.11.2018

To  
The Addl. Chief Secretary to Govt.  
Dept of Steel & Mines  
Govt. of Odisha,  
Bhubaneswar.

Sub: Recommendation of CSIR-NEERI Report on "Carrying Capacity Study for Environmentally Sustainable Iron and Manganese Ore Mining Activity in Keonjhar, Sundargarh and Mayurbhanj Districts of Odisha State" - Development of Suggested Ore Transport Mode (SOTM) in Koira Sector-reg.

Respected Sir,

This has reference to the subject cited. We have applied for Environmental Clearance for increase in production of Iron Ore from 5.0 Million TPA to 9.0 Million TPA in respect of Nadidih Iron & Manganese mine (M/s. Bonai Industrial Co. Ltd. in Sundergarh District of Odisha) to the MoEF&CC, Government of India. The MoEF&CC, Govt. of India have considered the proposal in the 38<sup>th</sup> meeting of the Reconstituted Committee of the Expert appraisal Committee for Environmental Appraisal of Non Coal Mining Projects constituted under the EIA notification 2006 on 16<sup>th</sup> of November 2018 (**Agenda No.2.29**). The minutes of the meeting is enclosed at **Annexure-I**. The committee have deferred the proposal and sought certain information to be submitted. In **Point No.iv** of the information sought the MoEF & CC have asked to **submit the development of SOTM, if any, Made by the Government of Odisha.**

The expansion of the mine is coming under SOTM I (100% ore transport by private Railway siding or conveyor belt upto public Railway siding or pipeline for captive mines and 70% for non-captive mines). As per the CSIR-NEERI recommendation, all the existing mines should ensure adoption of SOTM within next 5 years.

Nadidih Iron & Mn. Mines of M/s. Bonai Industrial Co. Ltd. is a non-captive mine having validity of lease period upto 31.03.2020. The ore produced from the mine is dispatched to different consumer industries through different public Railway sidings. The public Railway sidings are located at a far distance, the nearest being Barsuan at a distance of 38 km from the mine. It is not feasible to construct conveyor belt system for transport of iron ore from the mine to different Railway sidings due to problem in acquisition of private (including ST land), involvement of forest land, involvement of huge expenditures on this account as well as less availability of time since the mining lease period is valid upto 31.03.2020 only.

(Contd..P/2.....)

**RECEIVED**

*Ommy*  
24/11/2018

OFFICE OF THE SECRETARY  
STEEL & MINES DEPT



# BONAI INDUSTRIAL COMPANY LIMITED

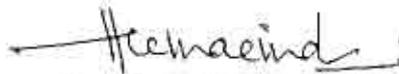
Registered Office MAIN ROAD, BARBIL - 758 035, DIST. - KENDUJHAR, ODISHA, INDIA  
Telefax : 06767 - 275481, E-mail : [bbiloffice@bonaiindustrial.com](mailto:bbiloffice@bonaiindustrial.com)  
CIN - U14109OR1939PLC000246

Page-2

In view of the above we would request your good self to kindly inform us about development of SOTM if any as per the information sought by the MoEF&CC as described above.

Thanking you,

Yours faithfully,  
For Bonai Industrial Co. Ltd.

  
Sr. Vice-President (G&E)

Encl: As above.

**Memo No..... dated 24.11.2018**

Copy forwarded The Director of Mines, Odisha, Bhubaneswar for kind information.

For Bonai Industrial Co. Ltd.

  
Sr. Vice-President (G&E)

**Memo No..... dated 24.11.2018**

Copy forwarded The Collector, Sundergarh for kind information.

For Bonai Industrial Co. Ltd.

  
Sr. Vice-President (G&E)

**Memo No..... dated 24.11.2018**

Copy forwarded The Deputy Director of Mines, Koira Circle, Koira for kind information.

For Bonai Industrial Co. Ltd.

  
Sr. Vice-President (G&E)



## BONAI INDUSTRIAL COMPANY LIMITED

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 Telefax : 06767 - 275481 E-mail : bbloffice@bonaiindustrial.com  
 CIN - U14109OR1939PLC000245

BICo/ED/GEO/2018-19/

Dated: 24.11.2018

To  
 The Addl. Chief Secretary to Govt.  
 Dept of Steel & Mines  
 Govt. of Odisha,  
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Sub: Recommendation of CSIR-NEERI Report on "Carrying Capacity Study for Environmentally Sustainable Iron and Manganese Ore Mining Activity in Keonjhar, Sundargarh and Mayurbhanj Districts of Odisha State" - Development of Suggested Ore Transport Mode (SOTM) in Koira Sector-reg.

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(Contd..P/2.....)



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Telefax : 06767 - 275481, E-mail: b5tooffice@bonaindustrial.com

CIN - U14109OR1939PLC000246

Page-2

In view of the above we would request your good self to kindly inform us about development of SOTM if any as per the information sought by the MoEF&CC as described above.

Thanking you,

Yours faithfully,  
For Bonai Industrial Co. Ltd.

Sr. Vice-President (G&E)

Encl: As above.

Memo No.....632..... dated 24.11.2018

Copy forwarded The Director of Mines, Odisha, Bhubaneswar for kind information.

For Bonai Industrial Co. Ltd.

Sr. Vice-President (G&E)

Memo No..... dated 24.11.2018

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For Bonai Industrial Co. Ltd.

Sr. Vice-President (G&E)

Memo No..... dated 24.11.2018

Copy forwarded The Deputy Director of Mines, Koira Circle, Koira for kind information.

For Bonai Industrial Co. Ltd.

Sr. Vice-President (G&E)



**GOVERNMENT OF INDIA  
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE  
(IMPACT ASSESSMENT DIVISION)  
NON-COAL MINING SECTOR**

\*\*\*

**SUMMARY RECORD OF 38<sup>th</sup> MEETING OF THE RECONSTITUTED COMMITTEE OF THE EXPERT APPRAISAL COMMITTEE FOR ENVIRONMENTAL APPRAISAL OF NON-COAL MINING PROJECTS CONSTITUTED UNDER EIA NOTIFICATION, 2006.**

The 38<sup>th</sup> meeting of the Reconstituted Expert Appraisal Committee for Environmental Appraisal of Mining Projects (Non-Coal) of the Ministry of Environment, Forest and Climate Change was held during **November 15-16, 2018**. The list of participants is annexed herewith. After welcoming the Committee Members, discussion on each of the Agenda Items was taken up ad-seriatim.

**(1.1) Deliberation & Circulation on the Minutes of the 37<sup>th</sup> EAC Meeting:**

The Minutes of the 37<sup>th</sup> Meeting of EAC held during **October 23-24, 2018** were circulated to the members of the Committee. The Committee made brief deliberations on the proposals placed in the last meeting and approved the same.

**Dated: November 15, 2018 [Thursday]**

**Consideration of Proposals**

- (2.1). Narayanposhi Iron and Manganese Ore Mine of M/s Aryan Mining & Trading Corporation Pvt. Ltd. for enhancement of Iron Ore from 3.0 Million TPA to 6.0 Million TPA (ROM) and existing 0.036 Million TPA Manganese ore and establishment of Beneficiation Plant with capacity of 2.0 Million TPA along with crusher and screening plant within the mine lease area, located at villages of Koira&Kashira and Kathamala RF, Tehsil Koira, District Sundargarh, Odisha (MLA 349.254 ha) (File No. J-11015/288/2008-IA.II(M); Proposal No. IA/OR/MIN/8345/2008) (Consultant: Creative Engineers & consultants)– Consideration of EC**

The proposal of M/s. Aryan Mining & Trading Corporation Pvt. Ltd. (AMTC) is for expansion of iron ore production from 3.0 MTPA to 6.0 MTPA (ROM) and existing 0.036 MTPA Manganese ore and establishment of Beneficiation Plant with capacity of 2.0 Million TPA along with crusher and screening plant within the mine lease area. The mine lease area is located in the villages of Koira & Kashira and Kathamala RF, Tehsil Koira, district Sundargarh, Odisha for. The lease area is falls under latitude 21<sup>o</sup> 54' 46.07" - 21<sup>o</sup> 56' 23.08" North and Longitude 85<sup>o</sup> 13' 41.22" - 85<sup>o</sup> 14' 55.00" East and falls under 73 G/1 &

Rajasthan vide letter dated 03.04.2018 and the lease deed was executed & registered on 06.04.2018 for 50 years.

Based on the discussion held and documents submitted the Committee **recommended** the above amendments as they are factual in nature.

**(2.28). Expansion of Srikurmam Heavy Mineral Sand Mine (from 2.0 MTPA to 6.0 MTPA) of M/s Trimex Sands Pvt. Ltd at Vatsavalasa & Tonangi Villages in Gara Mandal, Srikakulam District, Andhra Pradesh (720 Ha.) [File No: J-11015/175/2011-IA.II (M); IA/AP/MIN/21734/1910]**

The proposal of M/s Trimex Sands Pvt is for amendment in EC. It was informed to the Committee that there was an active court case in the Hon'ble Supreme Court for illegal mining. The Committee therefore **returned the proposal in present form.**

**(2.29). Expansion of production of Iron Ore from 5.3 million TPA (4.3 MTPA ROM Iron Ore+ 1.0 MTPA of low grade iron ore from old dump within lease area) to 9.0 million TPA (8.0 MTPA ROM+1.0 MTPA of low grade iron ore from old dump within lease area) in respect of Nadidih Iron & Manganese Mines of M/s Bonai Industrial Co. Ltd., located at village Nadikasira & Rengalbeda, Tehsil-Koira, District-Sundargarh, Odisha (MLA 73.855 ha) (File No. J-11015/135/2012-IA.II(M); Proposal No. IA/OR/MIN/83339/2012) (Consultant: Ecomen Laboratories Pvt. Ltd.) -Consideration of EC**

The proposal of M/s Bonai Industrial Co. Ltd. is for Expansion of production of Iron Ore from 5.3 million TPA (4.3 MTPA ROM Iron ore +1.0 MTPA of low grade iron ore from old dump within lease area) to 9.0 million TPA (8.0 MTPA ROM +1.0 MTPA of low grade iron ore from old dump within lease area) in the mine lease area of 73.855 ha. The mine lease area is located at village Nadikasira & Rengalbeda, Tehsil - Koira, District-Sundargarh, Odisha. The area is bounded by Latitude: 21° 57' 49" N - 21° 58' 25" N, Longitude: 85° 15' 32" E - 85° 16' 13" E in Survey of India Toposheet no. 73 G/5. The PP also presented the KML file during the presentation to indicate the location of mine lease on Google Earth/ DSS. It is a Category 'A' project as the mine lease area is located within 5 km of interstate boundary.

The proposal of TOR was earlier considered by the Expert Appraisal Committee in its meeting held during April 23-24, 2018 to determine the Terms of Reference (TOR) for undertaking detailed EIA study. The TOR was issued by the Ministry vide letter no. J-11015/135/2012-IA.II (M) dated 4th July, 2018. The Ministry has issued the corrigendum in TOR vide letter dated 17.09.2018. The Proponent submitted the EIA/EMP Report online to Ministry for seeking environmental clearance.

The total mine lease area of 73.855 ha comprises 67.637 ha of forest land (KF+DLC) and 6.218 ha of non-forest land. Stage-II Forest clearance for an area of 65.237 ha has been accorded by MoEF, vide letter no. 8-97/2008-FC dated 09/02/2011

and Stage II forest clearance of 2.40 ha (KF+DLC forest) coming under safety zone has been accorded by the Ministry of Environment and Forests vide letter no. 8-97/2008-FC dated 11.12.2014. Project Proponent reported that the mine is in operation since 11.12.1947. In pursuance to section 8-A (6) of MMDR Amendment Act, 2015, the mining lease period has been extended up to 31/03/2020 by execution of a Supplementary Lease Deed on 02.05.2015 over an area of 73.855 ha.

The mine was accorded Environmental Clearance vide order no. J-11015/135/2012-IA.II (M) dated 02.07.2015 for total handling of 5.3 million TPA of iron ore (4.3 million TPA of ROM and dry processing of 1.0 million TPA of low grade iron from old dumps within lease area) and installation of wet beneficiation plant of 1.0 million TPA capacity. Now it is proposed to increase production of Iron Ore from 4.3 million TPA ROM Iron ore to 8.0 million TPA (ROM) and dry processing of iron ore of 1.0 million TPA. Total handling will be 9.0 million TPA. 1.0 million TPA beneficiation plant is already approved with earlier environmental clearance vide letter No. J-11015/135/2012-IA. II (M), dated 02.07.2015. Total handling of iron ore will be 9.0 million TPA to get 8.245 million TPA of processed (screened, crushed and wet beneficiated) iron ore. The total handling (2019-20) from pit excavation and dump handling will be 1,18,79,025 metric tons (ROM Ore: 8.0 MT + Dump handling for low grade ore production: 1.0 MT + Excavation of OB/SB/IB = 2.879025 MT).

Project Proponent reported that the Modified Mining Scheme was approved by IBM vide letter No-MSM/FM/22-ORI/BHU/2018-19/1062, dated 02.08.2018 for expansion of Iron Ore Production. The Modification of scheme of Mining was approved vide letter No. MSM/FM/10-ORI/BHU/2015-16, dated 22.01.2016 for the period 2015-16 to 2017-18. The Review of the mining plan was approved vide letter No. MS/ FM/15-ORI/BHU/2017-18/1958 dated 02.11.2017 for the period 2018-19 to 2019-20 for the proposed production of 5.3 million TPA of iron. The modification of the Review of the Mining Plan has been approved by Indian Bureau of Mines vide letter no. MSM/FM/22-ORI/BHU/2018-19 dated 02.08.2018 for proposed production of 9.0 million TPA (8.0 MTPA ROM + 1.0 MTPA of low grade Iron Ore from reworking of old dump within lease area.

The mine lease area is 73.855 ha. The breakup of land use category at present is: Area excavated (33.9 ha), Over burden/dump (12.468 ha), Mineral Storage (8.438 ha), Infrastructure (0.769 ha), Roads (2.513 ha), Green belt & Plantation (4.575 ha), Mineral processing plant (2.159 ha), Tailing pond (1.927 ha) & unutilized (6.926 ha). Proposed land use shall be mining-42.6 ha, Overburden/Dumps-11.94 ha, Mineral Storage-3.299 ha, Infrastructure-0.769 ha, Roads-2.513 ha, Green Belt & Plantation-4.575 ha, Mineral processing Plant-2.159 ha and Tailing Pond-6.0 ha. The highest and lowest contours within lease are 615 m and 542 m respectively.

Project Proponent reported that the method of mining will be fully mechanized. The conventional opencast mining with mechanized drilling with 110mm dia drill machine, deep hole blasting, excavation by excavator of capacity up to 3.5/2.5 m<sup>3</sup> bucket capacity and stacking by loader of capacity upto 1.7/1.2 m<sup>3</sup>. Excavator of capacity up to 1.1m<sup>3</sup> will

be used for feeding the crushing & screening unit. ROM iron ore will then be processed through dry crushing & screening units. To prevent generation of fugitive dust during transportation of ore through trucks/dumpers, static water sprinklers have been installed along the haul road within the mine for a length of 4.5 km. Besides that water is also being sprinkled in dust prone areas through water tankers. The ROM, accumulated mineral rejects & wastes from Nadidih Iron & Manganese Mines will be hauled through trucks/dumpers to dry as well as wet processing plants. After processing, the finished iron ore will be carried by dumpers to the Railway siding and loaded into Rail wagons and dispatched mainly to the steel, pelletisation, sponge, sinter plants throughout India and also to port for export. At present, the production of the mine is restricted to excavation of Iron ore (ROM) from mine and dry screening & crushing of iron ore and beneficiation of low grade ore. Project proponent has informed that at present mining operation is at an RL of 512 m which is proposed to touch RL of 501m up to the plan period of 2018-19 for the targeted production and at an RL 483 m up to plan period 2019-20. As the ground water table is at an RL of 502m, the mine working will intersect the ground water table. A detailed "Hydro Geological Study" has been prepared by IIT (ISM) Dhanbad which has been submitted to the Ministry. The Committee deliberated the same. PP also informed that online application has been submitted to CGWA on 14.11.2018 for issue of NOC to abstract ground water. To improve the air quality regular sprinkling of water by both water tankers and static water sprinkling arrangement. Crushing and screening units are fitted with dry fog system. Regular environmental monitoring has been carried out to improve the environmental quality. Vehicles as well as heavy machineries are regularly monitored and their emission conforms prescribed limit. PP reported that the water requirement as per EC accorded on 02.07.2015 is 1940.6 KLPD (Surface water 1785.6 KLPD & Ground water 155 KLPD) including 1490.3 KLPD for Wet Beneficiation plant. The water is sourced from Karo River. At present the permission of surface water of 1057 m<sup>3</sup>/day and ground water 120 m<sup>3</sup>/day is already available with the lessee. The proposed requirement of water is 2298 KLPD (2143 KLPD of surface water & 155 KLPD ground water). At present the direct employment is 246 nos. This will increase to 335 nos. after expansion and indirect employment of 400 people as contract jobs, which will mainly be extended to the local people. So, 735 people will get engagement.

PP reported that at the end of the plan period i.e.; 2019-20 approximately 4.575 hectares of area will cover green belt and plantation. At the end of lease period (31.03.2020) of the mine approximately 8.62 hectare of exhausted quarry will be back filled and covered with plantation. The social infrastructure adjacent to the project area includes a health centre and one Primary School. As a part of CSR activities the Company has undertaken the construction works of School buildings, boundary wall for Schools, club houses in villages, digging of ponds in nearby villages and bore wells. Such type of work will continue in future. The entire infrastructure related facilities for traffic and transportation of material in/from the mine are already available.

Project Proponent reported that there are two Legal cases in this instant proposal. (i) 2(C)C Case No. 50/2013 pending in the Court of Ld. S.D.J.M. Bonai, Dist.- Sundargarh

initiated under section 15 of the E.P. Act, 1986. The said case has been stayed on 28.01.2014 by the Hon'ble High Court of Orissa in CRLMP NO. 44/2014 in Misc Case No. 23/2014. and (ii) Revision Application No. 22/(19)/2018/RC-I is Pending before Ministry of Mines, Government of India, New Delhi against the demand of State Govt. of Odisha dated 24.10.2017 U/s.21(5) of MMDR Act, 1957 for mineral produced in excess of the lower of the approved limits under Mining Plan and Consent to Operate. The aforesaid demand has been stayed by the Ministry of Mines on dated 01.02.2018.

Project Proponent reported that there is no National Park, Wildlife Sanctuaries, Biosphere Reserve, Wildlife Corridor, Tiger/Elephant Reserve etc. within the 10 km radius of mining lease area. The Mendhamaruni, Karo, Kathmal, Lakraghat, Karampada and Uliburu Reserve Forest are located within a radius of 10 km from the core zone of the mine lease area. The Karo river is flowing in the buffer zone at a distance of 0.3 km towards northeast and Suna River is flowing at a distance of 5.3 km south east from the mine lease boundary.

Project Proponent reported that the baseline data have been carried out during summer season (March to May 2018). PP submitted that the ambient air quality data for  $PM_{10}$ ,  $PM_{2.5}$ ,  $SO_2$  and  $NO_2$  were studied at 8 locations. From the study it is seen that, in the ambient air, the  $PM_{10}$  values were in the range from 65.89 to 86.30  $\mu g/m^3$ ,  $PM_{2.5}$  values were in the range of 44.78 to 55.83  $\mu g/m^3$ ,  $SO_2$  levels were ranging from 10.73 to 16.16  $\mu g/m^3$  and  $NO_2$  levels were ranging from 17.91 to 28.07  $\mu g/m^3$ . The predicted incremental concentration for  $PM_{10}$  is NIL to 3.29388  $\mu g/m^3$ , for  $PM_{2.5}$  the incremental concentration is from NIL to 1.02569  $\mu g/m^3$ , for  $NO_2$  the incremental concentration is from NIL to 0.00425  $\mu g/m^3$ . **PP has not predicted the incremental concentration for  $SO_2$  parameter. The Committee is of the view that the production of mine is almost double; however, the predicted incremental concentration for the parameters are very less and suggested that PP needs to re-calculate the prediction for all the parameters including  $SO_2$  and submit before the EAC for further deliberations.**

The Public Hearing was conducted by State Pollution Control Board on 10.10.2018 at playground near Nadidih Primary School of Village, Nadikasira under Koira tehsil of Sundargarh District. The Public Hearing was chaired by the Shri Bhaskar Chandra Turuk, Additional District Magistrate, Sundargarh. About 400 participants had attended the public hearing and 233 persons have put their signature in the attendance sheet. 33 persons took part in the deliberation. In total, 7 written statements have been received from various stake holders. The main issues raised during public hearing were bad road conditions of NH-215 leading to dust pollution during transportation, construction of bridge over Karo River outside mining lease for better connectivity from Kalta to Rengalbeda, provision of School bus upto Koira for DAV school from Kasira village, more employment for local people, drinking water facility, promotion of agriculture, issue related to environmental protection measures. Project proponent has agreed to engage one additional water tanker for sprinkling on road costing Rs. 10.00 lakhs per year, PP has agreed to construct the bridge within 18 months after approval from Forest

Department/competent authority for which Rs. 60/- lakhs will be spent, one school bus on hire basis has already been provided from 01.11.2018 costing Rs. 8.50 lakhs per year, employment of local people has already been given as per their eligibility, for providing further drinking water facility project proponent will spend Rs. 14.60 lakhs on this account, project proponent will expense Rs. One lakh for supply of seeds, fertilizers and training purpose to promote agriculture, project proponent is already using wet drilling and rock breakers to avoid blasting, static sprinkler system has already been installed, retaining wall, garland drain, settling tanks already exist in the mine and regular plantation is being carried out in the mine. Project proponent has already spent an amount of Rs. 4.0 Crore in this head and proposed to spend Rs. 40 lakhs per annum for better environmental management.

The MoEF&CC Regional Office Bhubaneswar, vide letter no. 101-8669/EPE, dated 19.04.2018, has submitted the certified compliance report of earlier EC no. J-11015/135/2012-IA. II (M), dated 02.07.2015. The Committee has deliberated the point wise compliance of Environmental Clearance. The report inter- alia mentioned that the project authority has complied or are in process of complying with the conditions stipulated by the Ministry. The PP was requested to submit the digital processing of entire lease area report within stipulated time period. As digital Processing of entire lease area is conducted once in three years. The Committee deliberated the issues raised by the Regional Office Bhubaneswar and is of the view that PP needs to submit the actions made by the PP after inspection/action plan on the issues flagged by the RO.

The Committee noted that the Ministry of Mines, vide Notification No.S.O.2817 (E) dated 22<sup>nd</sup> November, 2010 had appointed a Commission of Inquiry consisting Justice M.B. Shah, retired Judge of the Supreme Court of India, for the purpose of making an inquiry in to mining of iron ore and manganese ore in contravention of the provision of various Statues and the rules and regulations issued there under, in various States including the State of Odisha. In view of Justice Shah Commission report (2013), the Ministry of Environment, Forest and Climate Change (MoEF&CC) has entrusted the work to CSIR-NEERI to conduct a Carrying Capacity Study. In this context, CSIR-NEERI conducted the study encompassing collection of primary data for various environmental components (viz. air, noise, water, soil/land, biological and socio-economic aspects), collection and analysis of environmental quality data by different mines in the region, modeling for transport scenario and infrastructure need assessment, and meetings/workshops with different stakeholders. NEERI has submitted the report along with the recommendations. The PP has made the point-wise presentation w.r.t. the recommendations of CSIR-NEERI report on carrying capacity study may be included in the TOR condition w.r.t. mining proposal of Iron Ore and/or manganese in the State of Odisha. There are recommendations which needs to be implemented by the State Govt. and Project Proponent.

Project proponent has informed that the mine is presently under operation by complying all the conditions of CTE/CTO stipulated by SPCB, Odisha. Indian Bureau of Mines is also monitoring the compliance of all the conditions given in MP & PMCP. Project proponent has submitted that this mine is a non-captive mine having validity of lease

period upto 31.03.2020. The ore produced from the mine is dispatched to different consumer industries through different public Railway sidings. The public Railway sidings are located at a far distance, the nearest being Barsuan at a distance of 38 km from the mine. It is not feasible to construct conveyor belt system for transport of iron ore from the mine to different Railway sidings due to problem in acquisition of private land (including ST land), involvement of forest land, involvement of huge expenditures on this account as well as less availability of time since the mining lease period is valid upto 31.03.2020 only. PP informed that it is not feasible at this stage as the mining lease period will expire on 31.03.2020 to construct cement concrete roads from the exit point of the mine to the main road since it involves considerable expenditure as well as the time required to obtain the approval for use of forest land for the said purpose. PP informed that truck parking facility already exists within the mine. PP has requested State Govt. to create common parking plaza for transporting vehicles for cluster of mines through DMF fund.

The estimated project cost is Rs. 200 Crores. PP has earmarked Rs. 135.92 Lakhs for environment management plan, Rs. 200 Lakhs ESC and Rs. 48.03 Lakhs per annum for environment management plan.

The Committee, after detailed deliberations, **deferred** the proposal and sought the following requisite information: -

- (i) The Committee observed that the mine lease is valid only upto 31.03.2020 and the PP has proposed the Expansion of production of Iron Ore from 5.3 million TPA (4.3 MTPA ROM Iron Ore+ 1.0 MTPA of low grade iron ore from old dump within lease area) to 9.0 million TPA (8.0 MTPA ROM+1.0 MTPA of low grade iron ore from old dump within lease area). The Committee observed that the time for expiry of the mining lease is very less and PP needs to submit the time required for achieving the peak production after obtaining clearance from the Ministry because there are other statutory clearances such as CTO etc. needs to be obtained before mining for the expanded capacity. In addition to this PP needs to submit the month wise production plan (eg. Month 1, Month 2....) for proposed production capacity of Ore.
- (ii) Project Proponent reported that the baseline data have been carried out during summer season (March to May 2018). The predicted incremental concentration for PM<sub>10</sub> is NIL to 3.29388  $\mu\text{g}/\text{m}^3$ , for PM<sub>2.5</sub> the incremental concentration is from NIL to 1.02569  $\mu\text{g}/\text{m}^3$ ,<sup>1</sup> and for NO<sub>2</sub> the incremental concentration is from NIL to 0.00425  $\mu\text{g}/\text{m}^3$ . **PP has not predicted the incremental concentration for SO<sub>2</sub> parameter. The Committee is of the view that the proposed production of mine is almost twice; however, the predicted incremental concentration for the parameters are very less and suggested that PP needs to re-calculate the prediction for all the parameters including SO<sub>2</sub> and submit before the EAC for further deliberations.** In view of the above PP needs to redo the modeling and submit the details with inputs on Air Quality modelling along with

incremental ground level concentration due to mining and allied activities along with ore transportation on account of additional vehicles.

- (iii) The Committee has deliberated the point wise compliance of Environmental Clearance submitted by the Regional Office of the Ministry. The report inter- alia mentioned that the project authority has complied or are in process of complying with the conditions stipulated by the Ministry. **The PP was requested to submit the digital processing of entire lease area report within stipulated time period. As digital Processing of entire lease area is conducted once in three years.** The Committee deliberated the issues raised by the Regional Office Bhubaneswar and is of the view that PP needs to submit the actions made by the PP after inspection/action plan on the issues flagged by the RO.
- (iv) The Committee observed that as per the recommendations of NEERI report the State Government has to complete the SOTM within 5 years and as the EC capacity is 9 Million TPA, therefore, SOTM 1 may be applicable to this project and the Ore transport mode should be 100% by private railway siding or conveyor belt up to public railway siding or pipeline for captive mines and 70 % for non-captive mines. In this context PP submitted that It is not feasible to construct conveyor belt system for transport of iron ore from the mine to different Railway sidings due to problem in acquisition of private (including ST land), involvement of forest land, involvement of huge expenditures on this account as well as less availability of time since the mining lease period is valid upto 31.03.2020 only. The Committee ask the PP to submit the development on the SOTM, if any, made by the Government of Odisha.
- (v) The Occupational Health Surveillance report needs to be submitted by the PP.
- (vi) The PP needs to implement the recommendations of the report of carrying capacity study and necessary arrangement to be made to arrest "zero dust re-suspension".
- (vii) The Committee observed that as per the recommendations of NEERI report and its TOR condition no. 6, the PP needs to construct cement concrete road from mine entrance and exit to the main road with proper drainage system and green belt development within one year. PP informed that it is not feasible at this stage as the mining lease period will expire on 31.03.2020 to construct cement concrete roads from the exit point of the mine to the main road since it involves considerable expenditure as well as the time required to obtain the approval for use of forest land for the said purpose. The Committee deliberated the issues and is of the view that PP needs to submit action plan on the recommendations of the carrying capacity study.

- (viii) PP needs to submit the details of financial Assurance in the form Bank Guarantee during approval of Review of the Mining Plan for implementation of FMCP under Rule-24 of Mineral Conservation and Development Rules, 2017.
- (ix) The report inter-alia includes the presence of two schedule-I species namely Peacock & Python. PP needs to submit the species specific conservation plan for Schedule-I species along with the budgetary provisions.
- (x) Details of application made to CGWA for approval of intersection of ground water needs to be submitted.
- (xi) The PP needs to submit how they will reduce the water consumption over the years. Target for rain-water harvesting and reduction in water use needs to be explored and submitted.
- (xii) PP needs to submit the details of the activities and budget earmarked for Corporate Environmental Responsibility (CER) which shall be as per Ministry's O.M No 22-65/2017-IA. II (M) dated 01.05.2018 and its action plan on the activities proposed under CER.
- (xiii) PP needs to resubmit the action plans on the recommendations of the report of carrying capacity study.

**(2.30). Enhancement of capacity of Beach Sand Minerals from 25,00,000 TPA to 75,00,000 TPA (ROM) to be processed in the Mineral Separation Plant to extract ilmenite and other associated minerals (rutile, zircon, monazite, sillimanite and garnet) by M/s Indian Rare Earths Ltd., located at P.O. Matikhalo, Chatarpur, District Ganjam, Odisha (File No. J-11015/528/2007-IA.II (M); Proposal No. IA/OR/MIN/84026/2009)(Consultant-M/s Bhagavathi Ana Labs Pvt. Limited)-Consideration of EC**

The proposal is for enhancement of capacity of heavy mineral raw sand mining from 25,00,000 TPA to 75,00,000 TPA (ROM) which will be processed in the mineral separation plant to extract ilmenite and other associated minerals (rutile, zircon, monazite, sillimanite and garnet) in the area of an extent of 2877.76 ha. M/s IREL is a fully owned Government of India Public Sector undertaking, under the Administrative Control of the Department of Atomic Energy (DAE) engaged in mining, mineral separation and value addition of beach sand minerals for the last five decades. The Orissa Sands Complex (OSCOM) of IREL is situated in Ganjam District of Orissa State, on the east coast adjoining the Bay of Bengal and is engaged in mining and mineral separation of Ilmenite, Rutile, Zircon, Sillimanite, Garnet and Monazite from the mining lease area. The mining lease area of OSCOM, IREL extends over a stretch of 18 km along Bay of Bengal with an average width of 1.5 km. Atomic Mineral Directorate for Exploration and Research (AMD)

**OCCUPATIONAL HEALTH SURVEILLANCE :**

Nadidih Iron & Mn. Mines has implemented Integrated Management System as per international standard since the year 2013 for Quality, Environment, Occupational Health & safety and Social accountability). The Company has structured policy in this regard which is displayed at strategic locations of the mine and made available to all interested parties. Integrated Management System at Nadidih mines are audited internally as per the plan and schedule of internal audit. The same systems implementation is also audited by external body (certification Body-DNV) once in every six months.

Nadidih Iron & Mn. Mines is OHSAS 18001 : 2007 certified unit since 10.04.2013 . Certificates in this regard enclosed as **ANNEXURE - 1**

Comprehensive occupational health checkup are being done on regular basis for each and every employee irrespective of direct or contractual at the time of joining and on periodic basis to maintain surveillance on occupational health standard of mine workers.

Comprehensive occupational health surveillance report of all the employees including contractual workers conducted at the time of joining as well as on periodic basis for last three years enclosed as **ANNEXURE - 2**

Photographs and details of the tests conducted for occupational health surveillance of mine workers enclosed as **ANNEXURE - 3**

Nadidih Mine has its own equipped dispensary with Doctor, Paramedical staffs, ambulance facility etc. which caters the need of mine workers, their dependants and people of the surrounding area. All the facilities including medicine are provided at free of cost. Details of patients and treatment are documented for assessment of disease pattern and surveillance.

04. Patients record maintained at Dispensary of Nadidih Iron & Mn. Mines showing the disease pattern of the locality including mine workers for last three years enclosed as **ANNEXURE - 4**

# COMPREHENSIVE OCCUPATIONAL HEALTH REPORT



**NADIDIH IRON & MN. MINES  
B. I. CO. LTD.**

**IME/PME HELD DURING JUNE- JULY 2018**

CONDUCTED BY



**UTKAL POLYCLINIC**

**CENTRE FOR ENVIRONMENT & OCCUPATIONAL HEALTH  
AN ISO 9001 : 2015 CERTIFIED ORGANIZATION  
C/O. Palashpalli, Aerodrome Area, Shubaneswar, Odisha**



# UTKAL POLYCLINIC



## CENTRE FOR ENVIRONMENT & OCCUPATIONAL HEALTH

Registered under the Orissa Clinical Establishment Control and Regulation Act, 1990 & Rules 1994 (Regd. No.: 35/1998)

C-19, PALASPALLI, AERODROME AREA, BHUBANESWAR, ODISHA, PIN - 751020. PHONE : 0674-2593456

[ AN ISO 9001 : 2015 CERTIFIED ORGANISATION ]

### SUMMARIZED STATEMENT

NADIDIH IRON & MN. MINES  
B. I. CO. LTD.

MEDICAL EXAMINATION HELD DURING JUNE – JULY 2018

A.	TOTAL NO. OF EMPLOYEES UNDERGONE MEDICAL EXAMINATION	: 43
	TOTAL NO. OF EMPLOYEES UNDERGONE IME	: 01
	TOTAL NO. OF EMPLOYEES UNDERGONE PME	: 42
	TOTAL NO. OF EMPLOYEES DECLARED FIT	: 43
B.	SPECIAL TEST FOR DRIVERS & OPERATORS (EYE REFRACTION TEST)	: 58

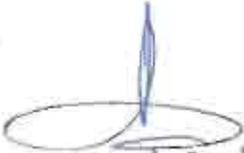
10/7/18  
DR E. N. MOHAPATRA, MBBS, AFPH (MUMBAI)  
Occupational Health Consultant, E2M4  
Trained in ILO Classification of ILO in pneumoconiosis  
Trained in Cardiology  
Regd. No-7338/Orissa/219 (DGFASLI)

**DISEASE PREVALENCE WITH PERCENTAGE****NADIDIH IRON & MN. MINES  
B. I. CO. LTD.**

Various data from Medical Examination Records are analyzed and following observations are made for the prevalence of the diseases and their effective prevention.

DISEASES	NO.OF PME : 042	
	Nos.	(%)
Hypertension	03	07.14
Diabetes / High Blood sugar	03	07.14
Hearing Problems	04	09.52
Noise Induced Hearing Loss	00	00.00
<b>EYE PROBLEMS</b>	06	14.29
• Refractive Error	06	14.29
• Cataract	00	00.00
Heart Diseases	00	00.00
Hydrocele	00	00.00
Hernia	00	00.00
<b>RESPIRATORY DISEASES</b>	00	00.00
• Chronic Bronchitis	00	00.00
• Tuberculosis	00	00.00
• Occupational Diseases	00	00.00
• COPD	00	00.00
• Malignancy	00	00.00

It is observed from the Medical Examinations records of employees that, no **Occupational Notifiable Diseases** are detected during the medical examination for the year 2018.

  
**DR. B. N. MOHAPATRA, MBBS, AFIH (MUMBAI)**  
 Occupational Health Consultant, EZM  
 Trained in ILO Classification of Pneumoconiosis

# **COMPREHENSIVE OCCUPATIONAL HEALTH REPORT**



***NADIDIH IRON & MN. MINES  
B. I. CO. LTD.***

**IME/PME HELD DURING JUNE - JULY 2017  
VENUE - EZMA OFFICE, BARBIL**

**CONDUCTED BY**



**UTKAL POLYCLINIC**  
CENTRE FOR ENVIRONMENT & OCCUPATIONAL HEALTH  
AN ISO 9001 : 2008 CERTIFIED ORGANIZATION  
C19, Palashpalli, Aerodrome Area, Bhubaneswar, Odisha



**UTKAL POLYCLINIC**  
**CENTRE FOR ENVIRONMENT & OCCUPATIONAL HEALTH**



Registered under the Orissa Clinical Establishment Control and Regulation Act, 1990 & Rules 1994 (Regd.No.: 35/1998)  
 C-19, PALASPALLI, AERODROME AREA, BHUBANESWAR, ODISHA, PIN-751020, PHONE: 0674-2593456

( AN ISO 9001 : 2008 CERTIFIED ORGANISATION )

## SUMMARIZED STATEMENT

NADIDIH IRON & MN. MINES  
 B. I. CO. LTD.

MEDICAL EXAMINATION HELD DURING JUNE - JULY 2017

A.	TOTAL NO. OF EMPLOYEES UNDERGONE MEDICAL EXAMINATION	: 30
	TOTAL NO. OF EMPLOYEES UNDERGONE IME	: 02
	TOTAL NO. OF EMPLOYEES UNDERGONE PME	: 28
	TOTAL NO. OF EMPLOYEES DECLARED FIT	: 30
B.	SPECIAL EYE REFRACTION TEST FOR DRIVERS & OPERATORS	: 51

*E.N. Mohapatra*  
 10/07/2017

DR. E. N. MOHAPATRA, MBBS, AFIH (MUMBAI)  
 Occupational Health Consultant, EZMA  
 Trained in ILO Classification of Pneumoconiosis  
 Trained in Cardiology  
 Regd.No-7338(Orissa).219 (DGFASLI)-

**DISEASE PREVALENCE WITH PERCENTAGE****NADIDIH IRON & MN. MINES, B. I. CO. LTD.**

Various data from Medical Examination Records are analyzed and following observations are made for the prevalence of the diseases and their effective prevention.

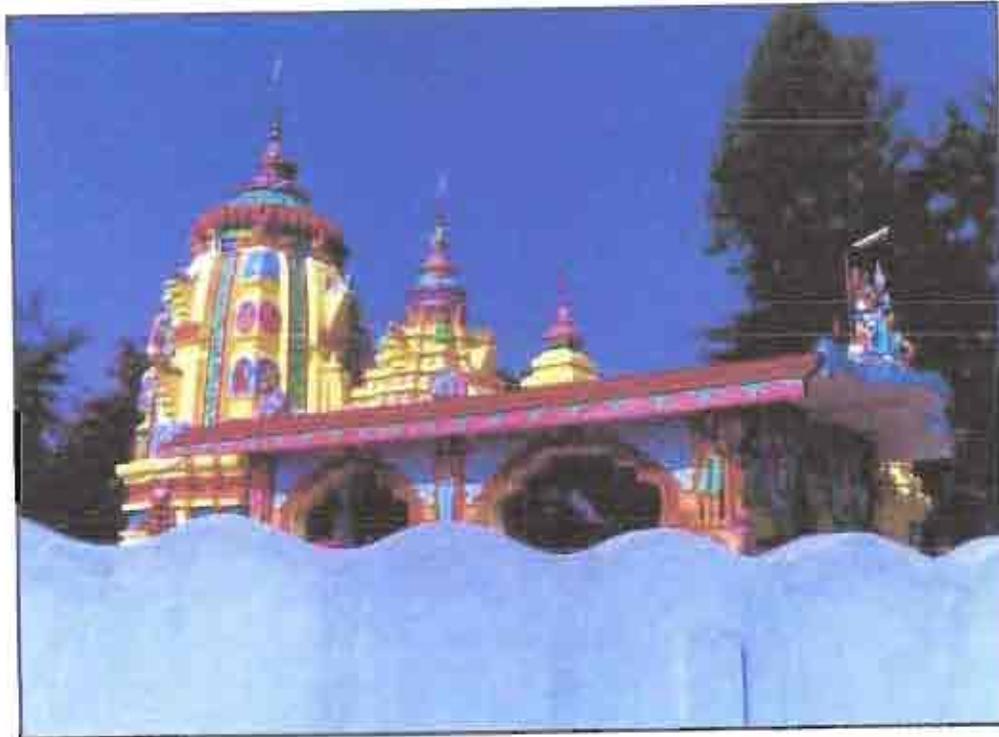
DISEASES	NO. OF PME : 28	
	Nos.	(%)
Hypertension	05	17.86
Diabetes / High Blood sugar	04	14.29
Hearing Problems	00	00.00
Noise Induced Hearing Loss	00	00.00
<b>EYE PROBLEMS</b>	03	10.71
• Refraction Error	03	10.71
• Cataract	00	00.00
• Colour Vision Defects	00	00.00
Heart Diseases	00	00.00
Hydrocele	02	07.14
Hernia	00	00.00
Acid Peptic Disease	01	03.57
<b>RESPIRATORY DISEASES</b>	00	00.00
• Chronic Bronchitis	00	00.00
• Tuberculosis	00	00.00
• Pneumoconiosis	00	00.00
• COPD	00	00.00
• Lung Cancer	00	00.00

It is observed from the Medical Examinations records of employees that, no **Occupational Notifiable Diseases** are detected during the medical examination for the year 2017.

DR. B. N. MOHAPATRA, MBBS, AFIH (MUMBAI)  
Occupational Health Consultant, EZMA  
Trained in ILO Classification of Pneumoconiosis

10/12/2018

# COMPREHENSIVE OCCUPATIONAL HEALTH REPORT



**NADIDIH IRON & MN. MINES  
M/S. B. I. CO. LTD.**

**PME HELD DURING JULY - 2016**

**CONDUCTED BY**



**UTKAL POLYCLINIC**

CENTRE FOR ENVIRONMENT & OCCUPATIONAL HEALTH

C19, PALASHPALLI, AERODROME AREA, BHUBANESWAR, ODISHA

**AN ISO 9001: 2008 CERTIFIED ORGANISATION**



**UTKAL POLYCLINIC**  
**CENTRE FOR ENVIRONMENT & OCCUPATIONAL HEALTH**



Registered under the Orissa Clinical Establishment Control and Regulation Act, 1990 & Rules 1994 (Regd.No.: 35/1998)

C-19, PALASPALLI, AERODROME AREA, BHUBANESWAR, ODISHA, PIN-751020, PHONE: 0674-2593456

( AN ISO 9001 : 2008 CERTIFIED ORGANISATION )

## SUMMERIZED STATEMENT

NADIDIH IRON & MN. MINES  
 B. I. CO. LTD.

MEDICAL EXAMINATION HELD DURING JULY 2016

A.	TOTAL NO. OF EMPLOYEES UNDERGONE IME	: 02
	TOTAL NO. OF EMPLOYEES UNDERGONE PME	: 29
	TOTAL NO. OF EMPLOYEES DECLARED FIT	: 31
	TOTAL NO. OF EMPLOYEES DECLARED UNFIT	: Nil
B.	SPECIAL TEST FOR DRIVERS & OPERATORS	: 42

  
 20.7.2016

DR B. N. MOHAPATRA, MBBS, AFHM (Mumbai)  
 Occupational Health Consultant  
 Trained in ILO Classification of Pneumoconiosis  
 Trained in Cardiology  
 Regd. No. 7338 (Orissa), 219 (DGFASLI)

**DISEASE PREVALENCE WITH PERCENTAGE****NADIDIH IRON & MN. MINES, B. I. CO. LTD.**

Various data from IME/PME Records are analyzed and following observations are made for the prevalence of the diseases and their effective prevention.

DISEASES	IME NO. OF CASES : 02		PME NO. OF CASES : 29	
	Nos.	(%)	Nos.	(%)
Hypertension	00	00.00	04	13.79
Diabetes / High Blood sugar	00	00.00	01	03.45
Hearing Problems	00	00.00	01	03.45
Noise Induced Hearing Loss	00	00.00	00	00.00
<b>EYE PROBLEMS</b>	00	00.00	09	31.03
• Refraction Error	00	00.00	08	27.59
• Cataract	00	00.00	01	03.45
• Colour Vision Defects	00	00.00	00	00.00
Heart Diseases	00	00.00	00	00.00
Hydrocele	00	00.00	00	00.00
Hernia	00	00.00	01	03.45
Acid Peptic Disease	00	00.00	00	00.00
<b>RESPIRATORY DISEASES</b>	00	00.00	01	03.45
• Chronic Bronchitis	00	00.00	00	00.00
• Tuberculosis	00	00.00	01	03.45
• Pneumoconiosis (Siderosis)	00	00.00	00	00.00
• COPD	00	00.00	00	00.00
• Lung Cancer	00	00.00	00	00.00

It is observed from the IME/PME Medical Examinations records of employees that, no **Occupational Notifiable Diseases** are detected during the medical examination for the year 2016.



26.7.16

**DR B. N. MOHAPATRA, MBBS, AFH (Mumbai)**  
**Occupational Health Consultant**  
 Trained in ILO Classification of Pneumoconiosis  
 Trained in Cardiology  
 Regd. No. 7338 (Orissa), 219 (DGFASLI)

OCCUPATIONAL HEALTH SURVEILLANCE



Pathological Examination



Audiometry



Spirometry



Chest X Ray



12 lead ECG



Eye test/Eye Refraction test



Exam by O. H. Physician



Aadhaar linked biometric documentation



Cardiological Examination

#### PATHOLOGY:

Urine, Fasting Blood Sugar, PP Blood Sugar, Lipid Profile(Cholesterol, Triglyceride, HDL, LDL, VLDL) Renal Profile(Urea, Creatinine), Total Blood count(TWBC, TRBC, Total Platelet Count), DC, ESR, Hb% and other specialized tests were conducted during IME/PME.

#### PULMONARY FUNCTION TEST:

Latest computerized equipment in Pulmonary Function (Spirometry) is conducted by a qualified expert for required pulmonary test, which includes recording of FVC, FEV1 and other parameters. And prior to the PFT the information regarding height, weight, date of birth, history of habits, health conditions and occupation for all workers are entered to the computer.

#### CARDIOVASCULAR ASSESSMENT:

A modern 12 lead RCG (Electrocardiogram) machine is being used to conduct the ECG of all the workers by a qualified ECG technician. The Cardiovascular Assessment including Blood test and ECG is analyzed by a qualified and experienced Cardiologist.

#### MEDICAL EXAMINATION:

Detailed Medical Examination including Blood Pressure Measurement, Pulse, Nervous system, Heart, Lungs, Abdomen, Locomotors system etc. are being examined by a qualified and experienced doctor as specified in the Mines Rule 1955 and Safety Conferences.

#### CHEST X-RAY:

300 MA X-Ray machine was used for effective radio imaging. Each worker subjected to a full size Posterior-Anterior chest Radiograph. All chest X-rays are classified for detection, diagnosis and documentation of Pneumoconiosis in accordance with I.L.O, Classification of radiographs by O.H Physician trained as specified by I.L.O and Consultant Radiologist.

#### AUDIOMETRY:

An ultramodern computerized audiometry is being done by a qualified Audiologist in a close chamber for an effective result. Audiometry assists to assess the impact of noise and dust pollution on human health.

#### EYE CHECKUP:

Special Eye Tests for drivers, Operators of HEMM and the eye problems detected during the medical examination camp are done by a qualified and experienced Eye Specialist with modern sophisticated equipment separately.

#### OCCUPATIONAL HEALTH PHYSICIAN:

After completion of the entire tests the employees present themselves before the Occupational Health Physician for final occupational health assessment. He reexamines all the systems including detailed neurological assessment as recommended in Safety Conferences and final diagnosis and suggestion are entered into the pre-designed format which is documented in the computerized data sheet.

## PATIENT DETAILS OF NADIDIH IRON &amp; MN. MINES DISPENSARY FOR THE YEAR 2016

MONTH	DEPT. EMPLOYEE/ CONTRACTUAL EMPLOYEE/ VILLAGERS	MALE	FEMALE	TOTAL	DISEASES					
					COLD & FEVER	MALARIA	TYPHOID	JAUNDICE	DYSENTRY	OTHERS
JAN	DEPT. EMPLOYEE	97	72	169	87	0	0	0	1	79
	CONTRACTUAL EMPLOYEE	193	0	193	80	1	0	0	14	91
	NADIKASIRA VILLAGE	47	38	85	29	4	1	0	7	44
	RENGALBEDA VILLAGE	31	16	47	22	4	0	0	3	18
	KENDUDIH VILLAGE	23	19	42	17	1	0	0	3	21
	GUDASAH VILLAGE	25	13	38	23	0	0	0	2	13
<b>TOTAL</b>		<b>416</b>	<b>158</b>	<b>574</b>	<b>264</b>	<b>11</b>	<b>1</b>	<b>0</b>	<b>32</b>	<b>266</b>
FEB	DEPT. EMPLOYEE	151	62	216	78	2	0	0	15	121
	CONTRACTUAL EMPLOYEE	205	0	205	74	2	0	0	25	104
	NADIKASIRA VILLAGE	66	57	123	44	4	0	0	9	66
	RENGALBEDA VILLAGE	13	9	22	11	3	0	0	2	6
	KENDUDIH VILLAGE	18	13	31	18	2	0	0	3	8
	GUDASAH VILLAGE	21	8	29	16	2	0	0	2	9
<b>TOTAL</b>		<b>477</b>	<b>149</b>	<b>626</b>	<b>241</b>	<b>15</b>	<b>0</b>	<b>0</b>	<b>56</b>	<b>314</b>
MAR	DEPT. EMPLOYEE	155	71	226	105	1	0	0	21	97
	CONTRACTUAL EMPLOYEE	170	14	184	88	4	0	0	15	77
	NADIKASIRA VILLAGE	81	47	130	47	11	1	0	10	61
	RENGALBEDA VILLAGE	31	18	49	19	3	0	0	4	23
	KENDUDIH VILLAGE	28	21	49	23	2	0	0	3	19
	GUDASAH VILLAGE	19	23	42	15	2	0	0	4	21
<b>TOTAL</b>		<b>486</b>	<b>194</b>	<b>680</b>	<b>299</b>	<b>25</b>	<b>1</b>	<b>0</b>	<b>57</b>	<b>298</b>
APR	DEPT. EMPLOYEE	108	48	156	67	2	0	0	9	78
	CONTRACTUAL EMPLOYEE	159	4	163	62	5	0	0	14	82
	NADIKASIRA VILLAGE	60	49	115	33	7	0	0	11	64
	RENGALBEDA VILLAGE	23	19	42	14	4	0	0	4	20
	KENDUDIH VILLAGE	36	38	74	33	14	0	0	3	24
	GUDASAH VILLAGE	9	13	22	9	3	0	0	4	6
<b>TOTAL</b>		<b>401</b>	<b>171</b>	<b>572</b>	<b>218</b>	<b>35</b>	<b>0</b>	<b>0</b>	<b>45</b>	<b>274</b>
MAY	DEPT. EMPLOYEE	114	50	164	40	1	0	0	13	110
	CONTRACTUAL EMPLOYEE	185	0	185	65	6	0	0	22	92
	NADIKASIRA VILLAGE	73	41	114	60	11	1	0	7	53
	RENGALBEDA VILLAGE	26	12	38	13	5	0	0	5	15
	KENDUDIH VILLAGE	23	19	42	9	8	0	0	4	21
	GUDASAH VILLAGE	30	22	42	12	3	0	0	4	23
<b>TOTAL</b>		<b>441</b>	<b>144</b>	<b>585</b>	<b>199</b>	<b>34</b>	<b>1</b>	<b>0</b>	<b>55</b>	<b>296</b>

*[Signature]*  
Sr. Medical Officer

JUN	DEPT. EMPLOYEE	138	33	191	54	3	0	0	27	107
	CONTRACTUAL EMPLOYEE	228	7	245	79	5	0	0	25	126
	NADIKASIRA VILLAGE	75	48	122	41	9	1	0	16	55
	RENGALBEDA VILLAGE	22	17	39	8	7	0	0	2	22
	KENDUDIH VILLAGE	38	29	67	20	19	0	0	3	25
	GUDASARI VILLAGE	16	13	29	6	3	0	0	3	17
<b>TOTAL</b>		<b>516</b>	<b>167</b>	<b>683</b>	<b>208</b>	<b>46</b>	<b>1</b>	<b>0</b>	<b>76</b>	<b>352</b>
JUL	DEPT. EMPLOYEE	158	59	217	95	5	1	0	19	96
	CONTRACTUAL EMPLOYEE	360	5	365	177	19	1	0	15	155
	NADIKASIRA VILLAGE	117	82	199	68	23	1	0	25	84
	RENGALBEDA VILLAGE	45	20	65	21	12	0	0	4	28
	KENDUDIH VILLAGE	19	22	41	11	14	0	0	2	14
	GUDASARI VILLAGE	48	35	83	26	7	0	0	9	41
<b>TOTAL</b>		<b>761</b>	<b>229</b>	<b>990</b>	<b>407</b>	<b>82</b>	<b>3</b>	<b>0</b>	<b>70</b>	<b>428</b>
AUG	DEPT. EMPLOYEE	147	44	191	110	0	0	0	7	74
	CONTRACTUAL EMPLOYEE	310	4	323	148	11	0	0	15	149
	NADIKASIRA VILLAGE	102	95	197	82	12	1	1	13	88
	RENGALBEDA VILLAGE	33	20	53	28	2	0	0	2	21
	KENDUDIH VILLAGE	33	30	63	27	12	0	0	3	21
	GUALI VILLAGE	11	8	19	12	3	0	0	0	4
	GUDASARI VILLAGE	42	34	76	31	10	0	0	2	33
<b>TOTAL</b>		<b>687</b>	<b>235</b>	<b>922</b>	<b>438</b>	<b>50</b>	<b>1</b>	<b>1</b>	<b>42</b>	<b>390</b>
SEP	DEPT. EMPLOYEE	112	76	188	87	0	0	0	10	91
	CONTRACTUAL EMPLOYEE	211	3	214	115	12	0	0	6	81
	NADIKASIRA VILLAGE	54	86	140	81	20	2	0	6	31
	RENGALBEDA VILLAGE	39	20	59	31	1	0	0	4	23
	KENDUDIH VILLAGE	40	43	83	42	6	0	0	1	34
	GUALI VILLAGE	13	2	15	10	1	0	0	2	0
	GUDASARI VILLAGE	47	34	81	46	9	0	0	4	22
<b>TOTAL</b>		<b>514</b>	<b>264</b>	<b>778</b>	<b>412</b>	<b>49</b>	<b>2</b>	<b>0</b>	<b>33</b>	<b>282</b>
OCT	DEPT. EMPLOYEE	134	33	171	54	2	0	0	9	96
	CONTRACTUAL EMPLOYEE	226	12	238	81	2	0	0	9	146
	NADIKASIRA VILLAGE	25	69	94	48	7	1	0	4	34
	RENGALBEDA VILLAGE	13	17	30	15	2	0	0	0	11
	KENDUDIH VILLAGE	16	28	44	14	11	0	0	2	17
	GUALI VILLAGE	6	2	8	6	0	0	0	0	2
	GUDASARI VILLAGE	38	14	52	27	6	0	0	0	19
<b>TOTAL</b>		<b>462</b>	<b>175</b>	<b>637</b>	<b>255</b>	<b>30</b>	<b>1</b>	<b>0</b>	<b>24</b>	<b>327</b>
NOV	DEPT. EMPLOYEE	105	44	149	73	3	0	0	13	60
	CONTRACTUAL EMPLOYEE	223	4	237	116	5	0	0	10	106
	NADIKASIRA VILLAGE	49	64	113	57	7	0	0	6	43
	RENGALBEDA VILLAGE	9	12	21	11	2	0	0	2	8
	KENDUDIH VILLAGE	24	22	46	24	8	0	0	2	12

*[Signature]*  
 In Charge Officer

	GUDASAH VILLAGE	28	13	41	17	3	0	0	3	18
	GUALI VILLAGE	6	2	8	4	0	0	0	0	4
<b>TOTAL</b>		<b>454</b>	<b>161</b>	<b>615</b>	<b>302</b>	<b>28</b>	<b>0</b>	<b>0</b>	<b>36</b>	<b>249</b>
<b>DEC</b>	DEPT. EMPLOYEE	161	73	235	122	6	1	0	11	101
	CONTRACTUAL EMPLOYEE	187	3	190	117	3	0	0	14	54
	NADIKASIRA VILLAGE	62	71	133	93	5	0	0	1	31
	RENGALBUDA VILLAGE	15	12	27	11	0	0	0	2	14
	KENDUDHI VILLAGE	31	18	49	23	5	0	0	3	18
	GUDASAH VILLAGE	30	14	44	22	2	0	0	1	19
	GUALI VILLAGE	8	0	8	2	0	0	0	1	3
<b>TOTAL</b>		<b>494</b>	<b>192</b>	<b>686</b>	<b>390</b>	<b>17</b>	<b>1</b>	<b>0</b>	<b>36</b>	<b>242</b>

Remarks: Majority of diseases are found seasonable in nature and some are lifestyle diseases.

  
 Sr. Medical Officer I/C  
 Dispensary  
 Naldih Iron & Mn. Mines



## ANNEXURE -4 Contd.

	KENDUDIH VILLAGE	27	25	52	16	16	0	0	3	17
	GUDASAH VILLAGE	27	17	44	21	0	0	0	2	21
	GUALI VILLAGE	8	2	10	4	1	0	0	1	4
<b>TOTAL</b>		<b>410</b>	<b>182</b>	<b>592</b>	<b>242</b>	<b>26</b>	<b>0</b>	<b>0</b>	<b>53</b>	<b>271</b>
<b>JUN</b>	DEPT. EMPLOYEE	109	69	178	58	1	1	0	27	91
	CONTRACTUAL EMPLOYEE	149	5	154	38	1	0	0	14	81
	NADIKASIRA VILLAGE	59	54	113	60	8	0	0	12	33
	RENGALBEDA VILLAGE	14	10	24	12	2	0	0	2	8
	KENDUDIH VILLAGE	22	19	41	14	7	0	0	2	18
	GUDASAH VILLAGE	13	9	22	11	1	0	0	3	7
	GUALI VILLAGE	14	2	16	7	0	0	0	0	9
<b>TOTAL</b>		<b>380</b>	<b>168</b>	<b>548</b>	<b>220</b>	<b>20</b>	<b>1</b>	<b>0</b>	<b>60</b>	<b>247</b>
<b>JUL</b>	DEPT. EMPLOYEE	160	80	240	111	2	1	0	28	98
	CONTRACTUAL EMPLOYEE	207	6	213	89	9	0	0	23	92
	NADIKASIRA VILLAGE	84	75	159	49	11	0	0	25	74
	RENGALBEDA VILLAGE	22	22	44	17	4	0	0	2	21
	KENDUDIH VILLAGE	19	14	33	14	10	0	0	2	7
	GUDASAH VILLAGE	27	19	46	19	5	0	0	6	16
	GUALI VILLAGE	14	2	16	8	0	0	0	1	7
<b>TOTAL</b>		<b>533</b>	<b>218</b>	<b>751</b>	<b>307</b>	<b>41</b>	<b>1</b>	<b>0</b>	<b>87</b>	<b>315</b>
<b>AUG</b>	DEPT. EMPLOYEE	152	59	211	91	1	0	0	9	110
	CONTRACTUAL EMPLOYEE	262	10	272	108	8	0	0	30	126
	NADIKASIRA VILLAGE	69	107	176	86	14	1	0	17	58
	RENGALBEDA VILLAGE	31	21	52	16	10	0	0	2	24
	KENDUDIH VILLAGE	13	17	30	13	5	0	0	3	10
	GUALI VILLAGE	14	1	15	9	0	0	0	0	6
	GUDASAH VILLAGE	34	14	48	21	5	0	0	3	19
<b>TOTAL</b>		<b>575</b>	<b>229</b>	<b>804</b>	<b>343</b>	<b>43</b>	<b>1</b>	<b>0</b>	<b>64</b>	<b>353</b>
<b>SEP</b>	DEPT. EMPLOYEE	129	66	195	91	0	0	0	8	96
	CONTRACTUAL EMPLOYEE	205	9	214	111	5	0	0	12	86
	NADIKASIRA VILLAGE	74	59	133	57	14	0	0	7	55
	RENGALBEDA VILLAGE	24	11	35	22	2	0	0	2	9
	KENDUDIH VILLAGE	23	21	44	24	6	0	0	4	10
	GUALI VILLAGE	13	3	16	8	0	0	0	3	5
	GUDASAH VILLAGE	21	18	39	18	4	0	0	3	14
<b>TOTAL</b>		<b>489</b>	<b>187</b>	<b>676</b>	<b>331</b>	<b>31</b>	<b>0</b>	<b>0</b>	<b>39</b>	<b>275</b>
<b>OCT</b>	DEPT. EMPLOYEE	171	69	240	108	0	0	0	9	123
	CONTRACTUAL EMPLOYEE	186	7	193	85	5	0	0	12	91
	NADIKASIRA VILLAGE	65	48	113	54	6	0	0	5	48
	RENGALBEDA VILLAGE	15	7	22	5	1	0	0	0	16
	KENDUDIH VILLAGE	12	14	26	15	0	0	0	3	8

*[Signature]*  
Sr. Medical Officer

	GUALI VILLAGE	9	0	9	3	0	0	0	0	6
	GUDASAH VILLAGE	34	11	45	21	1	0	0	0	23
<b>TOTAL</b>		<b>492</b>	<b>156</b>	<b>648</b>	<b>291</b>	<b>13</b>	<b>0</b>	<b>0</b>	<b>29</b>	<b>315</b>
<b>NOV</b>	DEPT. EMPLOYEE	155	78	233	136	0	0	0	3	104
	CONTRACTUAL EMPLOYEE	312	3	214	98	3	1	0	7	105
	RENGALBEDA VILLAGE	19	12	31	12	3	0	0	0	16
	KENDUDIHI VILLAGE	15	14	29	17	1	0	0	0	11
	GUDASAH VILLAGE	26	6	32	11	1	0	0	2	18
	GUALI VILLAGE	22	3	25	19	0	0	0	1	5
<b>TOTAL</b>		<b>507</b>	<b>154</b>	<b>661</b>	<b>336</b>	<b>11</b>	<b>2</b>	<b>0</b>	<b>18</b>	<b>294</b>
<b>DEC</b>	DEPT. EMPLOYEE	160	77	237	113	0	0	0	13	111
	CONTRACTUAL EMPLOYEE	185	9	194	91	3	1	0	12	87
	NADIKASIRA	67	55	122	71	4	0	0	12	35
	RENGALBEDA VILLAGE	19	7	26	6	1	0	0	3	16
	KENDUDIHI VILLAGE	24	5	29	14	0	0	0	4	11
	GUDASAH VILLAGE	14	9	23	14	3	0	0	2	4
	GUALI VILLAGE	9	3	12	12	0	0	0	0	0
<b>TOTAL</b>		<b>478</b>	<b>165</b>	<b>643</b>	<b>321</b>	<b>11</b>	<b>1</b>	<b>0</b>	<b>46</b>	<b>264</b>

Remarks: Majority of diseases are found seasonable in nature and some are lifestyle diseases.

  
 Sr. Medical Officer I/C  
 Dispensary  
 Nadidih Iron & Mn. Mines

PATIENT DETAILS OF NADIDIH IRON & MN. MINES DISPENSARY FOR THE YEAR 2018

ANNEXURE - 4 Contd.

MONTH	DEPT. EMPLOYEE/ CONT.EMPLOYEE/ VILLAGERS	MALE	FEMALE	TOTAL	DISEASES					
					COLD & FEVER	MALARIA	TYPHOID	JAUNDICE	DYSENTRY	OTHERS
JAN	DEPT. EMPLOYEE	172	86	258	137	1	0	0	13	107
	CONTRACTUAL EMPLOYEE	134	3	137	56	0	0	0	14	67
	NADIKASIRA VILLAGE	59	70	129	67	3	1	0	10	48
	RENGALBEDA VILLAGE	9	3	12	4	0	0	0	1	2
	KENDUDIHI VILLAGE	8	10	18	10	0	0	0	2	6
	GUALI VILLAGE	11	2	13	12	0	0	0	1	0
	GUDASAH VILLAGE	21	9	30	16	0	0	0	2	12
<b>TOTAL</b>		<b>414</b>	<b>183</b>	<b>597</b>	<b>302</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>43</b>	<b>247</b>
FEB	DEPT. EMPLOYEE	154	60	214	107	0	1	0	8	98
	CONTRACTUAL EMPLOYEE	180	7	187	97	2	1	0	12	75
	NADIKASIRA VILLAGE	68	79	147	92	4	1	0	6	44
	RENGALBEDA VILLAGE	21	13	34	19	2	0	0	3	10
	KENDUDIHI VILLAGE	16	15	31	12	1	0	0	2	16
	GUALI VILLAGE	7	1	8	5	0	0	0	1	2
	GUDASAH VILLAGE	24	7	31	14	1	0	0	2	14
<b>TOTAL</b>		<b>470</b>	<b>182</b>	<b>652</b>	<b>346</b>	<b>10</b>	<b>3</b>	<b>0</b>	<b>34</b>	<b>259</b>
MAR	DEPT. EMPLOYEE	146	80	226	123	0	2	0	11	90
	CONTRACTUAL EMPLOYEE	158	4	162	104	5	0	0	14	39
	NADIKASIRA VILLAGE	44	57	101	57	5	0	0	8	31
	RENGALBEDA VILLAGE	16	23	39	18	1	0	0	4	16
	KENDUDIHI VILLAGE	28	19	47	27	2	0	0	2	16
	GUDASAH VILLAGE	31	7	38	17	1	0	0	2	18
	GUALI VILLAGE	18	2	20	15	0	0	0	1	4
<b>TOTAL</b>		<b>441</b>	<b>192</b>	<b>633</b>	<b>361</b>	<b>14</b>	<b>2</b>	<b>0</b>	<b>42</b>	<b>214</b>
APR	DEPT. EMPLOYEE	134	61	195	71	0	0	0	24	100
	CONTRACTUAL EMPLOYEE	135	8	143	52	2	0	0	14	75
	NADIKASIRA VILLAGE	45	39	104	53	2	0	0	11	38
	RENGALBEDA VILLAGE	9	20	29	7	1	0	0	2	19
	KENDUDIHI VILLAGE	14	29	43	22	0	0	0	5	16
	GUDASAH VILLAGE	24	8	32	21	1	0	0	2	8
	GUALI VILLAGE	10	8	18	9	0	0	0	2	7
<b>TOTAL</b>		<b>371</b>	<b>193</b>	<b>564</b>	<b>235</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>60</b>	<b>263</b>
	DEPT. EMPLOYEE	138	65	203	80	0	1	0	20	102
	CONTRACTUAL EMPLOYEE	150	6	156	57	2	0	0	22	75
	NADIKASIRA VILLAGE	58	48	106	57	0	0	0	8	41

Medical Officer

MAY	RENGALBEDA VILLAGE	18	10	28	9	1	0	0	2	16
	KENDUDHI VILLAGE	21	25	46	22	0	0	0	9	15
	GUDASAH VILLAGE	21	7	28	16	0	0	0	3	9
	GUALI VILLAGE	11	2	13	5	0	0	0	2	6
<b>TOTAL</b>		<b>417</b>	<b>163</b>	<b>580</b>	<b>246</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>66</b>	<b>264</b>
JUN	DEPT. EMPLOYEE	113	52	165	55	0	0	0	12	98
	CONTRACTUAL EMPLOYEE	157	6	163	58	0	0	0	20	85
	NADIKASIRA VILLAGE	60	58	118	55	0	0	0	11	52
	RENGALBEDA VILLAGE	9	4	13	5	0	0	0	0	8
	KENDUDHI VILLAGE	7	15	22	12	0	0	0	3	7
	GUDASAH VILLAGE	19	8	27	12	0	0	0	3	12
	GUALI VILLAGE	8	2	10	4	0	0	0	0	6
<b>TOTAL</b>		<b>373</b>	<b>145</b>	<b>518</b>	<b>201</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>49</b>	<b>268</b>
JUL	DEPT. EMPLOYEE	159	78	237	116	0	1	0	9	111
	CONTRACTUAL EMPLOYEE	174	9	183	78	0	0	0	12	93
	NADIKASIRA VILLAGE	50	48	98	50	0	1	0	11	36
	RENGALBEDA VILLAGE	11	15	26	16	0	0	0	0	10
	KENDUDHI VILLAGE	13	11	24	16	2	0	0	4	2
	GUDASAH VILLAGE	18	9	27	14	0	0	0	2	11
	GUALI VILLAGE	19	3	22	8	0	0	0	0	14
<b>TOTAL</b>		<b>444</b>	<b>173</b>	<b>617</b>	<b>298</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>38</b>	<b>277</b>
AUG	DEPT. EMPLOYEE	195	85	280	145	0	0	0	8	127
	CONTRACTUAL EMPLOYEE	213	9	222	70	0	0	0	22	130
	NADIKASIRA VILLAGE	87	70	157	83	0	0	0	12	62
	RENGALBEDA VILLAGE	16	13	29	18	0	0	0	1	10
	KENDUDHI VILLAGE	18	17	35	25	0	0	0	3	7
	GUALI VILLAGE	18	1	19	13	0	0	0	1	5
	GUDASAH VILLAGE	44	17	61	36	0	0	0	1	24
<b>TOTAL</b>		<b>591</b>	<b>212</b>	<b>803</b>	<b>390</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>48</b>	<b>365</b>
SEP	DEPT. EMPLOYEE	173	66	239	1	11	0	1	99	127
	CONTRACTUAL EMPLOYEE	229	10	239	0	18	0	0	98	123
	NADIKASIRA VILLAGE	75	59	134	0	10	0	0	54	70
	RENGALBEDA VILLAGE	26	16	42	0	2	0	0	29	11
	KENDUDHI VILLAGE	13	4	17	0	2	0	0	10	5
	GUALI VILLAGE	9	4	13	0	0	0	0	8	5
	GUDASAH VILLAGE	28	7	35	0	3	0	0	18	14
<b>TOTAL</b>		<b>553</b>	<b>166</b>	<b>719</b>	<b>1</b>	<b>46</b>	<b>0</b>	<b>1</b>	<b>316</b>	<b>355</b>
OCT	DEPT. EMPLOYEE	160	88	248	133	0	0	0	10	85
	CONTRACTUAL EMPLOYEE	216	9	225	143	0	0	0	23	59
	NADIKASIRA VILLAGE	93	78	171	108	1	0	0	10	52
	RENGALBEDA VILLAGE	19	10	29	18	1	0	0	0	10

	KENDUDHI VILLAGE	24	19	43	27	0	0	0	2	14
	GUALI VILLAGE	13	2	15	9	0	0	0	0	6
	GUDASARI VILLAGE	42	10	52	41	0	0	0	4	7
<b>TOTAL</b>		<b>567</b>	<b>216</b>	<b>783</b>	<b>499</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>49</b>	<b>233</b>
<b>NOV</b>	DEPT. EMPLOYEE									
	CONTRACTUAL EMPLOYEE									
	RENGALBEDA VILLAGE									
	KENDUDHI VILLAGE									
	GUDASARI VILLAGE									
<b>TOTAL</b>										
<b>DEC</b>	DEPT. EMPLOYEE									
	CONTRACTUAL EMPLOYEE									
	NADIKASIRA VILLAGE									
	RENGALBEDA VILLAGE									
	GUALI VILLAGE									
<b>TOTAL</b>										

Remarks: Majority of diseases are found seasonable in nature and some are lifestyle diseases.

  
Sr. Medical Officer DC  
Dispensary  
Nadidih Iron & Mn. Mines



# BONAI INDUSTRIAL COMPANY LIMITED

Registered Office : MAIN ROAD, BARBIL - 758 035, DIST. - KENDUJHAR, ODISHA, INDIA  
Telefax : 06767 - 275481, E-mail : bbloffice@bonaiindustrial.com  
CIN - U14109OR1939PLC000246

Date: 24.11.2018

## UNDERTAKING

In compliance to the information sought by the Expert Appraisal Committee in item no. (vi) of the minutes in respect of Nadidih Iron & Manganese Mine of M/s Bonai Industrial Co. Ltd. (Agenda no. 2.29) during the 38<sup>th</sup> EAC meeting held on 15/16.11.2018, we do hereby undertake **"to make necessary arrangement to arrest zero dust re-suspension in mineral carrying road within three months period"**.

For Bonai Industrial Co. Ltd.

A handwritten signature in blue ink, appearing to be 'P. Rungta', written over a circular stamp or mark.

Director



# BONAI INDUSTRIAL COMPANY LIMITED

Registered Office : MAIN ROAD, BARBIL - 758 035, DIST. - KENDUJHAR, ODISHA, INDIA

Telefax : 06767 - 275481, E-mail : bbloffice@bonaiindustrial.com

CIN - U14109OR1939PLC000246

Date: 24.11.2018

## UNDERTAKING

In compliance to the information sought by the Expert Appraisal Committee in item no. (vii) of the minutes in respect of Nadidih Iron & Manganese Mine of M/s Bonai Industrial Co. Ltd. (Agenda no. 2.29) during the 38<sup>th</sup> EAC meeting held on 15/16.11.2018, we do hereby undertake **"to construct concrete road with proper drainage system and greenbelt development within a period of one year"**.

For Bonai Industrial Co. Ltd.

A handwritten signature in blue ink, appearing to be 'R. S. Rungta', written over a horizontal line.

Director

**MODIFICATION OF REVIEW OF THE MINING PLAN  
M/s. Bonai Industrial Company Limited**

Further the contact details of local authority are made available and as follows:

a) **Fire brigade station facility available:**

Fire brigade facility available at Koira fire station Contact no. 9437787224

b) **Other emergency contact numbers:**

Government Offices	Telephone No.
Police Station	06625/235023
Fire Brigade	9437787224
Dispensary (Bonai Industrial Co. Ltd.)	9438633401(Doctor)
Ambulance	9438704358, 9438647150

Company Executive & Office Officers	Office	Mobile Number
D.G.M.(Mining)	9437056761	9438153126
Sr. Mgr.(Mining)	-	9437597972
Dy. Mgr. (Pers)	-	9437716346

**8.5**

**Care and maintenance during temporary discontinuance:**

The following care & maintenance is taken during temporary discontinuance.

- i) Total lease area is already surrounded by barbed wire fencing. Security will be there in all the opening to prevent animals and outsiders from entering in the lease.
- ii) All the quarries are surrounded by soil bund and it will then be use from preventing animals from falling in it.
- iii) Plantation will be kept under active watch and ward to maintain the greenery.
- iv) All the ore stacks will be properly, maintained and measured regularly to avoid theft.
- v) All the staff will be given proper medical facilities.
- vi) All the movable machineries will be kept in a particular place to avoid any theft of the parts.
- vii) Watch & ward will be kept near all the static machineries or building

**8.6**

**Financial Assurance:**

For Nadidih Iron and Manganese Mine, the lessee has been submitted financial assurance of Rs. 2,21,56,500.00 (Rupees two crores twenty one lakh fifty six Thousand five hundred only) in the form of Bank Guarantee No. 110/17 dated 16.10.2017 as stated in Rule 27 of Mineral Conservation and Development Rules, 2017 which will expire on 31.3.2020. This mine is a "A" Category mine and financial assurance is calculated @ Rs.3,00,000/ hectare (73.855ha x 3,00,000 = Rs.2,21,56,500.00). The copy of bank guarantee is attached as annexure -31.

**MODIFICATION OF REVIEW OF THE MINING PLAN  
M/s. Bonai Industrial Company Limited**

**Table No.8.17  
CALCULATION OF FINANCIAL ASSURANCE**

Sl. No.	Head	Area put on use at start of plan	Additional Requirement During Plan Period	Total	The area considered as fully reclaimed and rehabilitated	Net area considered for Calculation
a	b	c	d	e = (c+d)	f	g = (e-f)
1.	Area to be Excavated	33.90	+7.979	41.879	0.5	41.879
2.	Storage for top soil	-	-	-	-	-
3.	Overburden/Dump	12.648	-0.708	11.94	-	11.94
4.	Mineral Storage	8.438	-4.418	4.02	-	4.02
5.	Infrastructure	0.769	-	0.769	-	0.769
6.	Roads	2.513	-	2.513	2.513	2.513
7.	Railway	-	-	-	APPROVED	-
8.	Green belt (Safety zone + Plantation)	4.575	-	4.575	4.575	4.575
9.	Tailing Pond	1.927	+4.073	6.0	6.0	6.0
10.	Effluent treatment Plant	-	-	-	REGIONAL CONTROLLER OF MINES BHUWANESEWAR	-
11.	Mineral separation Plant	2.159	-	2.159	REGIONAL CONTROLLER OF MINES BHUWANESEWAR	2.159
12.	Mine Camp	-	-	-	-	-
13.	Others	-	-	-	-	-
	<b>TOTAL</b>	<b>66.929</b>	<b>6.926</b>	<b>73.855</b>	<b>0.5</b>	<b>73.855</b>

**8.7 Certificates & Undertakings:**

The progressive mine closure plan will comply all statutory rules, regulations, orders made by the Central or State Government, statutory organizations, court etc. have been taken into consideration and wherever any specific permission is required, the lessee will approach the concerned authorities. All the measures proposed in this progressive mine closure plan will be implemented in a time bound manner as proposed (Enclosed as Annexure).

\*\*\*\*\*

**PART-B**

**9.0 Certificates/Undertakings/Consents**

1. Consent letter from the applicant
2. Certificate from Qualified persons



Advances Section, Chaldasa

REF: ADV- BGEXTN: 110/17/2017-18

Dated: 16<sup>th</sup> Oct 2017

To  
The Regional Controller of Mines,  
Indian Bureau of Mines,  
Bhubaneswar Odisha-751020

With Extension of BG 110/17 on behalf of BONAI INDUSTRIAL CO LIMITED

Please find herewith the Extension of original Bank Guarantee No- 110/17 in your Favour on behalf of Messer BONAI INDUSTRIAL CO LIMITED and which will be handed over to you by the party directly. Details of which are as follows:

1.	Bank Guarantee no	110/17
2.	Amount of BG	Rs.2,01,10,125/- (Rupees Two Crores Three Lakhs Ten Thousand One Hundred And twenty five only)
3.	Beneficiary	The Regional Controller of Mines, Indian Bureau of Mines, Bhubaneswar Odisha
4.	Date Of Issue	19-05-2017
5.	Date of Extension	16-10-2017
6.	Guarantee Cover From	19-05-2017 to 31-03-2020
7.	Claim Period	upto or before 30-06-2020

Kindly arrange to send an undertaking letter for return of the original Bank Guarantee after its expiry. The second copy of the BG will be sent to you by post for comparison and verification with the original as annexed.

Kindly acknowledge the receipt

श्री कनारा बँक  
CANARA BANK

M. Abhinav  
FOR THE ADVANCES SECTION  
16/10/2017 for Rs. 2,01,10,125.00/- (Original)

Advances Section  
Chaldasa  
751020

*(Signature)*

☎ 0672 2002420/444  
☎ 0672 252443  
☎ 067235 0000/0000

2017

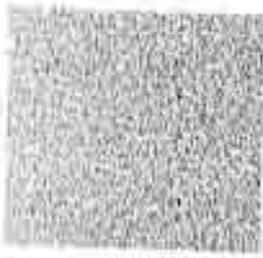


INDIA NON JUDICIAL  
Government of Jharkhand

e-Stamp

- Certificate No.
- Certificate Issued Date
- Account Reference
- Unique Doc. Reference
- Value Paid By
- Description of Document
- Property Description
- Consideration Price (Rs.)
- First Party
- Second Party
- Amount Paid By
- Stamp Duty Amount (Rs.)

IN-JH05205713040559P  
 Dt-Mar-2017 05:31 PM  
 NONACC (FV) Jharkhand/CHAIBASA/JH-WS  
 GOIN/JH/DH/OFF/CO/7074933103NG5005  
 DONAL INDUSTRIAL CO LIMITED  
 Article 2 Agreement or memorandum of an Agreement  
 BANK GUARANTEE  
 0  
 (Zero)  
 DONAL INDUSTRIAL CO LIMITED HUNGTA HOUSE CHAIBASA  
 CANARA BANK JARKHAR MARKET CHAIBASA  
 DONAL INDUSTRIAL CO LIMITED HUNGTA HOUSE CHAIBASA  
 100  
 (One Hundred only)



Please write on type below this line  
LETTER FOR EXTENSION OF BANK GUARANTEE  
CANARA BANK, CHAIBASA

To  
The Regional Controller of Mines  
Jharkhand, Ranchi  
Jharkhand

Date: 16.10.2017



Subj: Our guarantee no. 110/17 dated 19.05.2017 for Rs 20318125.00 issued to you on behalf of DONAL INDUSTRIAL CO. LIMITED towards Financial Assurance.

श्री. केनरा बैंक  
THE CANARA BANK

VO 0003202048  
श्री. केनरा बैंक  
FOR CANARA BANK

*(Signature)*  
15

*(Signature)*



The original guarantee issued in your favour on behalf of **Sarna Industries Co. Limited** is hereby cancelled upto **31.03.2020**,

notwithstanding anything contained therein.

- 1. Our liability under this Bank Guarantee shall not exceed its **₹30000000.00** (Rupees two crores three lakhs ten thousand one hundred and twenty five only).
- 2. This Bank Guarantee shall be valid upto **31.03.2020**.
- 3. We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only and only if your draw upon us is within claim or demand on or before **30.06.2020**.

This copy form is integral part of the original guarantee no. **110/17** dt **19.05.2017** and its terms and conditions and all other terms and conditions of the original bank guarantee remain unaffected.

कृते केनरा बैंक  
For CANARA BANK

*[Signature]*  
23.03.20  
23/03/2020

कृते केनरा बैंक  
FOR CANARA BANK

*[Signature]*  
23/03/2020  
23/03/2020

*[Handwritten mark]*

*[Handwritten mark]*



Advances Section, Chaitasa

RTI/16 - ADV/ BG/EXTN/06/2013/2017-18

Date: 16<sup>th</sup> Oct 2017

to

The Regional Controller of Mines,

Indian Bureau of Mines,

Bhubaneswar Odisha-751020

Sub: Extension of BG 06/2013 on behalf of BONAI INDUSTRIAL CO LIMITED

Please find herewith the Extension of original Bank Guarantee No- 06/2013 in your favour on behalf of Messrs BONAI INDUSTRIAL CO LIMITED and which will be handed over to you by the party directly. Details of which are as follows:

1.	Bank Guarantee no	06/2013
2.	Amount of Bx	Rs.18,46,375/- (Rupees Eighteen Lakhs Forty Six Thousand Three Hundred And Seventy five only)
3.	Beneficiary	The Regional Controller of Mines, Indian Bureau of Mines, Bhubaneswar Odisha
4.	Date of Issue	02-04-2013
5.	Date of Extension	16-10-2017
6.	Guarantee Cover From	02-04-2013 to 31-03-2020
7.	Claim Period	on or before 30-06-2020

Kindly arrange to send an undertaking letter for return of the original Bank Guarantee after its expiry. The second copy of the BG will be sent to you by post for comparison and verification with the original as annexed.

Yours faithfully,

FOR CANARA BANK

Signature of the undersigned

IN WITNESS WHEREOF, I have signed this document for Rs. 18,46,375.00/- (Original)

Adv. Manager  
Advances Section  
Chaitasa (751020)

Tel: +91 6742 20837/40200144  
Fax: +91 6742 208400  
Email: advm@canarabank.com

CA

22/10/17

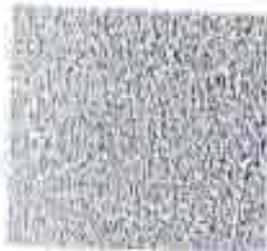


सत्यमेव जयते

**INDIA NON JUDICIAL  
Government of Jharkhand**

**e-Stamp**

Certificate No.	: IN-JH052001504894681
Certificate Issue Date	: 23-Mar-2017 04:29:41M
Account Reference	: NONACC (T) /INDOPJCH/CHAIBASA/ T+WS
Unique Doc. Reference	: SUBIN-JH/INDOPJCH/07M032940512942
Provided by	: BONAI INDUSTRIAL CO LIMITED
Description of Document (or any Description)	: Article 5 Agreement or memorandum of an Agreement
Consideration Price (Rs.)	: BANK GUARANTEE
	: 0
	: (Zero)
Paid Party	: BONAI INDUSTRIAL CO LIMITED RUNTA HOUSE CHAIBASA
Received Party	: CANARA BANK MAIN MARKET CHAIBASA
Stamp Duty Paid By	: BONAI INDUSTRIAL CO LIMITED RUNTA HOUSE CHAIBASA
Stamp Duty Amount(Rs.)	: 100
	: (One Hundred only)



LETTER FOR EXTENSION OF BANK GUARANTEE  
CANARA BANK, CHAIBASA

To  
The Principal Controller of Mines,  
Asstt. Secretary of Mines,  
Bhubaneswar

Date: 16/10/2017



Yours faithfully,  
Subj: can Guarantee no. 06/2013 dated 02.04.2013 for Rs. 1846375.00 issued to you on behalf of  
BONAI INDUSTRIAL CO, LIMITED towards financial Assistance.

FOR CANARA BANK

FOR CANARA BANK

*(Signatures and stamps)*



The subject guarantee issued in your favour on behalf of Rural Industries Co. Limited is hereby cancelled upto 31.03.2020.

Notwithstanding anything contained herein:

- 1. The liability under this Bank Guarantee shall not exceed Rs 184635.00 (Rupees Eighteen Lakh fifty six thousand three hundred and fifty five only).
- 2. This Bank Guarantee shall be valid upto 31.03.2020.
- 3. We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only and only if you have upon us a written claim or demand in or before 30.06.2020.

The above forms an integral part of the original guarantee no. 06/2013 dt 02.04.2013 and the bank attached thereto and all other terms and conditions of the original bank guarantee remain in force.

ಕರ್ನಾಟಕ ಬ್ಯಾಂಕ್  
For CANARA BANK

*[Signature]*  
ವಿಭಾಗೀಯ ನಿರ್ದೇಶಕರು  
ಕರ್ನಾಟಕ ಬ್ಯಾಂಕ್

ಕರ್ನಾಟಕ ಬ್ಯಾಂಕ್  
FOR CANARA BANK

*[Signature]*  
ವಿಭಾಗೀಯ ನಿರ್ದೇಶಕರು  
ಕರ್ನಾಟಕ ಬ್ಯಾಂಕ್

*[Handwritten mark]*

*[Handwritten mark]*



**Site Specific Conservation Plan for Indian Peafowl and Indian Rock Python in the study area of Nadidih Iron and Manganese Mine**

**of**

**M/s Bonai Industrial Company Ltd.,  
Distt. Sundargarh, Odisha**

**Prepared by**

**Ecomen Laboratories Pvt. Ltd,  
Flat Nos. 5-8 , 2nd floor, Arif Chamber-V,  
Sector H, Aliganj, Lucknow-226024 (U.P.),  
Phone No. (91-522) 2746282, Fax. No. (91-522) 2745726**



## CONTENTS

<b>S.No.</b>	<b>Description</b>	<b>Page No.</b>
1.0	Introduction	1
2.0	Details of two Schedule- I fauna	2-8
2(A)	Indian Peafowl	2-4
2(B)	Indian Rock Python	4-8
3.0	Conservation Plan	8-11
4.0	Funding	12
<b>Exhibit:</b>		
1	Lease area showing habitat development for Schedule - 1 fauna	13

## 1.0 Introduction:

The Nadidih Iron & Manganese Mine of M/s Bonai Industrial Co. Ltd., is one of the oldest mine in the Koirra mining sector, has been in operation since 1947. The mining lease covers an area of 73.855 ha in the villages Nadikasira & Rengalbeda of Bonai Sub-division District Sundargarh, Odisha. The lease area falls in the Survey of India Toposheet No. 73 G/5. The lease area of 73.855 ha consists of 67.637 ha of forest land and 6.218 ha of non forest land.

As a part of EIA/EMP, the study of Flora & Fauna was undertaken by M/s Ecomen Laboratories Pvt. Ltd., Lucknow during March - May '2018. Ecomen Laboratory is accredited by QCI-NABET and the approved expert in Ecology & Biodiversity has been involved in the study and also this conservation plan.

Two Schedule - 1 fauna (Peacock & Python) mentioned in the authenticated list of DFO Bonai are discussed.

A site specific conservation plan for the above two fauna has been prepared to ensure that mine activities have minimum impact on them.

The project proponent is actively involved in the conservation of wild life in the mine's surrounding area. Site specific conservation plan as prepared by Forest department has already been approved by principal CCF (Wild Life) cum Chief Wild Life Warden, Odisha. The fund requirement for implementation of the plan has been estimated at Rs. 91 lacs (in the buffer zone).

All steps within the lease area shall be undertaken by the company under the guidance of the monitoring committee and DFO. A budget of Rs. 32 lacs has been provided by the company for implementation of the plan within the lease area. The plan will take care of Conservation of fauna including the above mentioned two Schedule -1 fauna.

## 2.0 The Details of two Schedule- I fauna are given below:

### 2A) Indian Peafowl:

The male Indian Peafowl, commonly known as the peacock, is one of the most recognizable birds in the world. These large, brightly colored birds have a distinctive crest and an unmistakable ornamental train.



When displaying to a female, the peacock erects this train into a spectacular fan, displaying the ocelli to their best advantage.

The more subtly colored female Peafowl is mostly brown above, with a white belly. Her ornamentation is limited to a prominent crest and green neck feathers. Though females (2.75-4.0 kg) weight nearly as much as the males (4.0-6.0 kg), they rarely exceed 1.0 meter in total body length.

#### i) Habitat and Behavior:

It is a bird of scrub-jungles and forest edges, showing affinity to moist and dry deciduous and semiarid biomes. It is also found in agriculture fields, along streams with good vegetation and close to human settlements. It stays on trees and also uses tall buildings where trees are scarce. It generally prefers a habitat mosaic of scrub and open areas, with adequate sites for 'dust bathing' and 'lekking', a phenomenon where males are known to congregate in open areas for displaying to attract females. Dust bathing is critical as this bird has to condition its feathers and remove feather-degrading bacteria and other external parasites. It is likely that the availability of such habitats partly explains the relatively high abundance of this species in semi arid and flood plains.

**ii) Diet:**

Indian Peafowl do most of their foraging in the early morning and shortly before sunset. They retreat to the shade and security of the forest for the hottest portion of the day. Foods include grains, insects, small reptiles, small mammals, berries, wild figs, and some cultivated crops.

**iii) Reproduction:**

Indian Peafowl are polygamous. Males tend to be clumped together during the breeding season. They establish their breeding territories in close proximity to one another in a breeding arrangement known as a lek.

The precocial chicks are able to follow their mother nearly as soon as they hatch. The peahen leads them to appropriate feeding areas. The chicks pecks at food items in imitation of their mother and are soon feeding themselves with little parental guidance.

**iv) Conservation status:**

The Indian Peafowl is listed as Least Concern species in the Red List of International Union for Conservation of Nature (Bird Life International 2008), probably owing to its widespread distribution, occurrence of locally abundant semi feral populations, and protection from people on religious grounds. In India, it is given the utmost protection by inclusion in the Schedule 1 of Indian Wildlife Act, 1972. Although the train feathers of the Indian Peafowl are traded for various reasons, it is not included on any Appendix of the Convention on International Trade of Endangered Species, perhaps on the claim that these feathers are naturally fallen ones, during annual molt of the species, and also that the scale of trade across international border is still to be understood.

#### **v) Threats & Conservation Activities:**

The Indian Peafowl is under threat from various quarters that includes the demand for feathers, wild meat, conflict with human, habitat degradation etc. The following needs to be studied and actions planned as needed:

- 1) Habitat and distribution status of the species across the country, inside and outside protected areas.
- 2) Times series analysis of habitat change to quantify the rate of change and identify high-risk areas and potential sites for further affirmative action
- 3) Estimation of population size by established count methods such as line transect call counts and roost counts
- 4) Intensive ecological investigations in representative sites in major biogeography zone with focus on the effects of threats in relation to breeding success and survival probability. This should be taken under point B conservation.

#### **2B) Indian Rock Python (*Python molurus molurus*):**

This is a non venomous snake. The colour is dark brown and yellowish white in a blotched pattern. They are very good swimmers and take to water when disturbed, but on land, they hiss and remain motionless. The species is oviparous and lay up to 100 eggs in a clutch, protected and incubated by the female. Being exothermic, python basks in open but can also raise body temperature by muscular contractions.

##### **i) Habitat:**

Python occurs in wide range of habitats viz. rocky foot hills, grass lands, marshes, swamps, wood lands, open jungle besides rainforests, river valleys, woodlands, scrublands, grassy marshes, and semi rocky foothills. At times, they take refuge in mammal burrows, hollow trees etc. It has also been reported close to habitation and crop fields. They are usually

found in habitats with areas that can provide sufficient cover. They are never found very far from water sources, and seem to prefer very damp terrain.

The snake feeds on mammals, birds and reptiles but prefers the first. Chital deer, fawns, hares, mouse deers, jungle fowl are natural food. It can swallow prey bigger than its size as the jaw bones are not hinged. The prey is constricted to death by muscular movement and swallows head first. Once held in Jaw prey cannot escape because of inward bent teeth.

## **ii) Physical Description:**

Indian pythons are divided into two recognized subspecies, which can be distinguished by physical characteristics. Indian pythons, *P. molurus molurus*, stay smaller, reaching a maximum of about 6.4 m (21 ft) in length, and weighing as much as 91 kg (200 lbs.). The hides of both subspecies are marked with a rectangular mosaic type pattern that runs the full length of the animal. *P. molurus bivittatus* is more darkly colored, with shades of brown and dark cream rectangles that lay over a black background. This subspecies is also characterized by an arrow-shaped marking present on the top of the head, which begins the pattern. *P. molurus molurus* has similar markings with light brown and tan rectangles placed over a typically cream background. *P. molurus molurus* only has a partial arrow-shaped marking on the top of the head. Each scale of *P. molurus molurus* is a single color.

Indian pythons are dimorphic with females of both subspecies being longer and heavier than males. Males have larger cloacal spurs, or vestigial limbs, than do females. The cloacal spurs are two projections, one on either side of the anal vent, that are thought to be extensions of posterior limbs.

### iii) Reproduction:

Young Python molurus are precocial when they hatch. They become independent soon after hatching. Python molurus reaches sexual maturity between 2-3 years of age provided the proper body weight is met. At this time courting behavior may begin.



During courtship, the male wraps his body around the female and repeatedly flicks his tongue across her head and body. Once they align their cloacas, the male uses his vestigial legs to massage the female and stimulate her. Copulation ensues, with the female raising her tail to allow the male to insert one hemipenis (he has two) into the female's cloaca. This process lasts between 5-30 minutes. Approximately 3-4 months later, the female lay up to 100 eggs, each weighing as much as 207 g (7.3 oz). At this time the female generally coils around the eggs in preparation for an incubation period. Incubation lasts between 2-3 months.

### Key Reproductive Features:

During incubation female Python molurus use muscular contractions or "shivers" to raise their body temperatures slightly higher than the surrounding air temperature. It is very uncommon for a mother to leave the eggs during incubation. Once the eggs hatch, the young quickly become independent.

### iv) Behavior:

Python molurus is a solitary species. Mating is the only time



that these snakes are commonly found in pairs. Indian pythons will generally move only when food is scarce or when threatened. They may stalk prey, first locating it by scent or by sensing the body heat of the prey with their heat pits, and then following the trail. These snakes are primarily found on the ground, but will sometimes climb trees. Indian pythons are also very often found in or near water. They are expert swimmers, and can stay submerged without breathing for up to thirty minutes at a time. During colder months, starting in October and ending in February, Indian pythons stay hidden and will usually enter a brief period of hibernation until the temperature rises again.

**v) Communication and Perception:**

Like all snakes, chemoreception is important for finding prey, and generally perceiving the environment. Python molurus also has heat sensing pits on its head that allow it to detect endothermic prey that are warmer than the surrounding environment. It has poor eyesight.

**vi) Food Habits:**

Python molurus is carnivorous. Its diet consists mostly of live prey. Its staples are rodents and other mammals. A small portion of its diet consists of birds, amphibians, and reptiles. When looking for food P. molurus will either stalk prey, ambush, or scavenge for carrion. These snakes have very poor eyesight. To compensate for this, the species has a highly developed sense of smell, and heat pits within each scale along the upper lip, which sense the warmth of nearby prey. Indian pythons kill prey by biting and constricting until the prey suffocates. Prey items are then swallowed whole. To accomplish the feat of swallowing the prey, P. molurus molurus dislocates its jaw and stretches its highly elastic skin around the prey. This allows these snakes to swallow food items many times larger than their own heads. In cases of scavenging there is no constriction of the prey.

## vii) Ecosystem Roles:

Python molurus eats many rodents as well as a variety of vertebrates. It may be important in limiting populations of its prey.

## viii) Threats & Conservation:

The skin of Indian pythons is highly valued in the fashion industry due to its exotic look. In its native range it is also hunted as a source of food. There is a high amount of exportation for the pet trade.

**Pythons are held** endangered according to law. Many specimens are killed due to ignorance or out of fear when they enter habitation and capture goats or poultry. **Python molurus is listed by IUCN as lower risk, near threatened.**



## 3.0 Conservation Plan:

### i) Habitat Loss & Plantation:

The project proponent has developed around 12.735 ha (North East ) part of the lease (Ref. **Exhibit No.1**) into green cover with tall trees, followed by bush and shrubs and restrict the area from the approach of human, vehicles and poachers. This will help peafowl and others to build their nests and not get disturbed. A total of 98800plants have been planted within the lease area. The survival rate is about 84%. It is proposed to plant 12500saplings up to 31/3/2020 over an area of 5 ha.

Species to be planted are Neem, Sal, Siris, Mahua, Amla, Kendu, Arjun, Sheesham, Gamb hari, Simaruba & Bamboo.

### ii) Poaching:

Project proponent will take necessary action to protect the anti fauna activities, especially peafowl from poaching. Awareness and regular

monitoring shall be done to prevent this. Night watchers shall be appointed.

**iii) Bird bath:**

Birds cool themselves in summer by flapping their wings in water and bathing by dipping their heads. The bird baths are created at convenient points. These are 60 cm deep and slanting to merge at ground level on one side. The dimensions are 3m x 3m and lined with HDPE and sides covered with boulders and soil. The HDPE sheets are further anchored by driving iron pegs in eyes, on the border. Clear water is filled everyday in this and all leaves and debris removed and Potassium Permanganate (KMnO<sub>4</sub>) solution added to oxidize any organic matter and bacteria. Care is taken to see that the bath receives good sunlight. Perching trees and shrubbery are planted in a grove at a distance of 5m.

**iv) Noise/light pollution control:**

Proper machine maintenance, air silencers to modulate noise, synchronized blasting in different mines and tree belt are effective means to act as acoustic barriers. Dispersion of light is minimized by covering upper half of headlight with black paint, orienting all overhead light towards mine pits, allowing light only to the required area by proper shades etc. Low mast street light have already been installed by the site of haul road for less dispersion of light during night hours. Blasting is controlled in nature at the mine and same practice shall be continued in future also. Vehicle movement is avoided to the extent possible from the plantation zone.

**v) Fire control:**

In addition to whole time Van Sahayaks, who are patrolling the area, villagers of Nadikashira & Rengalbeda are provided proper incentives to prevent fire. Each village is given an incentive of Rs.20,000/- to take

proactive steps in creation and maintenance of outer fire line, be vigilant during fire season and attend at once to extinguish any accidental fire. The incentive is released only after the fire season is over and job entrusted is achieved. This will continue further.

**vi) Awareness:**

Undertaking outreach activities to sensitize local communities, which may be carried out by a network of student/clubs community is encouraged.

Local youth in different schools are sensitized on forest and wildlife conservation and their role in curbing the degrading factors. Emphasis is laid on fire conservancy and self protection.

Conservation of soil, water, flora and fauna will be possible only when the villagers of nearby area understand their duties and responsibilities well. Sensitisation seminars are done during Van Mahotsava and wildlife week every year when local leaders, Forest and Revenue officials are invited to deliberate on the prevailing scenario and to develop the environment to near natural condition. Villagers are encouraged to open up and speak their minds. At such functions, suitable rewards are given to members of public/workers taking keen interest in the conservation. This will continue further.

**vii) Control of vehicular traffic:**

The speed of vehicle, in no case, exceed 25 km/hr. The drivers are advised to maintain a gap of at least 50m between the vehicles to allow dust to settle and to break noise. Fitness of each vehicle is examined periodically.

**viii) Monitoring and evaluation:**

The plantation raised, their establishment, reclamation plan etc. are monitored once/twice every year by a committee consisting of the DFO or his representative, G.M. (Environment), two members from the adjacent

villages, a member from the labour union and the Sarpanch of the area. The frequency shall be increased further.

**ix) Assisted Natural Regeneration:**

Temporary nursery are established and one year old seedlings or 6 month old seedlings depending on performance of different species are raised. Natural growth are cleared and singled out prior to planting. Usual procedure of planting and post care for 5 years is adopted. Villagers of the area are involved in the regeneration work. This improves the food for animals.

**x) Alternate cropping:**

Simultaneously with habitat protection and rejuvenation, alternate cropping of vegetables and flowers, fruits like papaya, guava, sapota, pineapple and medicinal plants etc. are promoted with collaboration of horticulture department.

**4.0 Funding:**

As discussed earlier the project proponent has already kept a budget of Rs.32.0 lacs for implementation of the conservation plan for the lease area apart from 91.0lacs of fund which shall be utilized for buffer zone of the mine. The project proponent has already spent Rs 75 lacs up to March 2018 against the same.



# BONAI INDUSTRIAL COMPANY LIMITED

## Nadidih Iron & Manganese Mines

NADIKASIRA, P.O. - KOIRA - 770 048, DIST. - SUNDARGARH, ODISHA

E-mail : nadidihmines@bonaindustrial.com

BICO/ED/GEO/18-19/231

To

Date:-14.11.2018

The Regional Director,  
Central Ground Water Board,  
South Eastern Region,  
Bhubaneswar-751030

Sub: Application for issue of NOC to abstract ground water in respect of Nadidih Iron & Manganese mine of M/s Bonai Industrial Co. Ltd. located in vill Nadikasira & Rengalbeda, Block- Koida, Dist.-Sundergarh, Odisha.

Ref: Our online application No.:21-4/2146/OR/MIN/2018

Sir,

With reference to the subject cited above, we are submitting herewith the duly signed printed form of the application with all relevant enclosures in respect of Nadidih Iron & Manganese mine located in vill Nadikasira & Rengalbeda, Block- Koida, Dist.-Sundergarh, Odisha.

So we request you that, necessary permission to abstract groundwater may be granted.

Thanking you  
Yours Faithfully  
For Bonai Industrial Co.Ltd.

  
Mines Manager  
Nadidih Iron & Mn. Mines  
M/s. B. I. Co. Ltd.

Encls:

1. Signed application form
2. Processing fee of Fresh NOC for ground water extraction vide Transaction Ref No 1911180001224
3. Approved surface plan(Annexure-1)
4. Approved Mining Plan(Annexure-2)
5. Location Map(Annexure-3)
6. Land use(Annexure-4)
7. Location details of well/piezometer(Annexure-5)
8. Water level data(Annexure-6)
9. Water quality data(Annexure-7)
10. Existing NOC(Annexure-8)
11. Hydrogeological report(Annexure-9&10)
12. Water balance diagram(Annexure-11)
13. Rainwater harvesting report(Annexure-12)
14. Copy of TOR(Annexure-13)
15. Authorisation letter(Annexure-14)

11/14/2018

NOCAP



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)

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Application Name:	NOCAP	Feedback	Change Password	Profile
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Government of India Central Ground Water Authority (CGWA) Ministry of Water Resources, River Development and Ganga Rejuvenation Applications for Issue of NOC to Abstract Ground Water (NOCAP)			
Application for Permission to Dewater Ground Water for Mining Industry (Application for New NOC)			
Application Number : 21-4/2146/OR/MIN/2018			
<b>1. General Information:</b>			
Water Quality:	Fresh Water		
Whether Ground Water Utilization for:	Expansion Program Of Existing Industry		
Date of Commencement Mine/Project:	11/12/1947		
Date of Expansion:	01/03/2018		
Application Type Category/ Type of Application	Iron ore		
<b>2. Name of Mine/Project:</b>			
NADIDH IRON AND MANGANESE MINES OF M/S BONAI INDUSTRIAL COMPANY LTD.			
<b>3. Location Details of the Mining (Inn- (Attach Site, Approved Mining Plan) (\$):</b>			
Address Line 1:	NADIDH IRON AND MANGANESE MINES		
Address Line 2:	M/S BONAI INDUSTRIAL COMPANY LTD.		
Address Line 3:	VILL. NADKASIRA AND RENGALBEDA BLOCK/MANDAL KOIRA, DIST- SUNDARGARH		
State:	ODISHA		
District:	SUNDARGARH		
Sub-District:	KOIDA		
Village/Town:	Nadkhasra		
Latitude:	21.864030		
Longitude:	85.288880		
Area Type :	Non-Notified		
Area Type Category :	Safe		
<b>4. Communication Address</b>			
Address Line 1:	DIRECTOR		
Address Line 2:	M/S BONAI INDUSTRIAL CO. LTD (NADIDH IRON AND MN MINE)		
Address Line 3:	RUNTA OFFICE, MAIN ROAD, BARBEL		
State:	ODISHA		
District:	KENDUJHAR		
Sub-District:	JODA		
Pincode:	759035		
Phone Number with Area Code:	91 6787 276601		
Mobile Number:	91 7008971513		
Fax Number:			
E-Mail:	bnt.geology@bonaiindustrial.com		
<b>5. Salient Features of the Activity:</b>			
Open cast iron ore Mine with proposed production of 9.0 MTPA (8.0 MTPA ROM + 1.0 MTPA of low grade iron ore from reworking of old dump within lease area )			
<b>6. Land Use Details of the Surroundings ( km 10 Radius – Outside): (\$)</b>			
Land Use Details of the Surroundings(km 10 radius):	Enclosed as Annexure-4		
<b>7. Land Use Detail of Project Area</b>			
Land Use Details	Existing (sq meter)	Proposed (sq meter)	Grand Total (sq meter)
Green Belt Area	45750.00	45750.00	91500.00

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		NOCAP		
Open Land		559980.00	659980.00	1319960.00
Road/ Paved Area		25130.00	25130.00	50260.00
Roof top area of building/ sheds		7890.00	7890.00	15780.00
Total		738550.00	738550.00	1477100.00
<b>8. Topography of the Area</b>				
a) Regional	Topography is more or less flat terrain with a few hillocks. The highest one is with RL of 815m and the lowest is at 542MRL.			
b) Project Area	The project area is hilly terrain with occasional mounds within the lease area. The maximum RL is 815m in the NW part in the lease hold area and the min RL is 542 m in the mid of the lease hold. Karu Nala is flowing in the north western to North eastern part of the lease area. The slope is towards north and north west.			
<b>9. Drainage in the Area (River / Nala etc)</b>				
a) Regional	The major catchments basins on regional basis of the area is given below. i) Kundu Nadi- In the south-eastern part ii) Karu Nadi - Over the central area			

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NOCAP



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)**

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Application Name	Apply	Feedback	Change Password	Profile
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<p>Government of India Central Ground Water Authority (CGWA) Ministry of Water Resources, River Development and Ganga Rejuvenation Applications for Issue of NOC to Abstract Ground Water (NOCAP)</p> <p><b>Application for Permission to Dewater Ground Water for Mining Industry (Application for New NOC)</b></p> <p><b>Application Number : 21-42146/QR/MIN/2018</b></p>									
b) Project Area					There is no perennial nala flowing through the lease area.				
16. Source of Availability of Surface Water - Furnish Details:					Karo river-0.55 km NW				
17. Average Annual Rainfall in the Area (in mm):					1305.00				
12. Townships/Villages within 10 km radius of the Project:					Refer Annexure-1				
13. Whether the Groundwater Table will be intersected by Activity :-					Yes				
(a) At What Depth (in bgl)					Pre-monsoon		Post-monsoon		
Minimum (in bgl)					44.00		40.00		
Maximum (in bgl)					45.00		41.00		
(b) Maximum Depth Proposed to Dewater (in bgl)					23.00				
(c) Groundwater Flow Direction (Attach Map)(S)					From SW to NE				
(d) Any Other Information					No				
14. Total Water Requirement for various Purpose to be Mentioned					m <sup>3</sup> /day		m <sup>3</sup> /year		
Ground Water Required through Abstract Structure					200.00		73000.00		
Ground Water Abstracted on account of Dewatering / Mining Seepage					30.00		9000.00		
Total Ground Water Withdrawal					230.00		82000.00		
16. Details of De-Watering Structure									
(a) De-Watering Existing Structure									
Number of Existing Structures:					0				
SNo.	Type of Structure Name / Year of Construction	Depth(M eter) / Diameter (mm)	Depth to Water Level (Meters below Ground Level)	Discharge (m <sup>3</sup> /Hour)	Operational Hours(Day) / Days(Year)	Mode of Lift Name	Horse Power of Pump	Whether fitted with Water Meter	Whether Permission Registered with CGWA, if so Details Thereof
(b) De-Watering Requirement and Proposed Structure Detail									
Number of Proposed Structures:					1				
SNo.	Type of Structure Name / Year of Construction	Depth(M eter) / Diameter (mm)	Depth to Water Level (Meters below Ground Level)	Discharge (m <sup>3</sup> /Hour)	Operational Hours(Day) / Days(Year)	Mode of Lift Name	Horse Power of Pump	Whether fitted with Water Meter	Whether Permission Registered with CGWA, if so Details Thereof
1	Mining Pits / 2018	84.00 / 100	40.00	10.00	3 / 300	Centrifugal Pump	10.00	No	No / -
16. Proposed Utilization of Pumped Water (Please Attach Details)(m <sup>3</sup> /year) (S)									
(a) Domestic Use in Mines									
(b) Water Supply									
(c) Agriculture									
(d) Green Belt Development									
(e) Suppression of Dust					5000.00 dewatering water will be stored and used for dust suppression and silt/solids maintenance				
(f) Recharge									

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(g) Any Other Item									
<b>17. Monitoring of Ground Water Regime (Attach Map(\$))</b>									
(a) Location Details of the Wells / Piezometers (Latitude, Longitude, Reduced Level)	Details given as Annexure-5								
(b) Number of Wells / Piezometers	Dug Well-3nos. Piezometer-1no.								
(c) Attach Details of GW Level of Observation Wells / Piezometers( At Least for One Year )(\$)	Details given as Annexure-6								
(d) Number of Wells / Piezometers Proposed to Monitor	4(Three dug wells and one piezometer)								
(e) Number of Piezometers Proposed to Monitor to Construct in Surroundings	1(one)								
(f) General Water Quality Report from NABL accredited lab(in the Area and Surroundings) (\$)	Enclosed as Annexure-7								
(g) Any Other Item		no							
<b>18. Proposed Pump / Pumping Groundwater Outside the Mine Pit for Domestic or Other Use (if so, give Details):</b>									
Number of Existing Structures: 2									
SNo.	Type of Structure Name / Year of Construction	Depth(Meter) / Diameter (mm)	Depth to Water Level (Meters below Ground Level)	Discharge (m <sup>3</sup> /Hour)	Operational Hours(Day) / Days(Year)	Mode of Lift Name	Horse Power of Pump	Whether fitted with Water Meter	Whether Permission Registered with CGWA/IF so Details Thereof
1	Sorewell / 2005	111.00 / 127	12.00	9.00	7 / 365	Submersible Pump	10.00	Yes	Yes / NOC obtained vide No.21-4(314)/SER/CGWA/2013-724 dated 5th May 2015. Copy enclosed as Annexure-8
2	Sorewell / 2016	127.00 / 127	11.00	9.00	7 / 365	Submersible Pump	10.00	Yes	Yes / Refer Annexure-9
Number of Proposed Structures: 1									
SNo.	Type of Structure Name / Year of Construction	Depth(Meter) / Diameter (mm)	Depth to Water Level (Meters below Ground Level)	Discharge (m <sup>3</sup> /Hour)	Operational Hours(Day) / Days(Year)	Mode of Lift Name	Horse Power of Pump	Whether fitted with Water Meter	Whether Permission Registered with CGWA/IF so Details Thereof
1	Sorewell / 2018	130.00 / 127	11.00	9.00	8 / 365	Submersible Pump	10.00	No	No / -
<b>19. Groundwater Availability Report ( Please Enclose a Comprehensive Report on Groundwater Condition / Groundwater Quality in and Around 5Km of the Area) Map showing location of groundwater regime monitoringwells, flow chart showing details of water requirement and recycle water use and gainfull of pumped water- (\$)</b>									
The detail hydrogeological report are given as Annexure-9 and 10									
Flow chart showing details of water requirement and recycle water use-Annexure-11									
<b>20. Details of Rainwater Harvesting / Artificial Recharge Measures for Groundwater Recharge in the Area, if already implemented, details may be Furnished. (Attach Report on Comprehensive &amp; Feasible Rainwater Harvesting / Recharge Proposal)- (\$)</b>									
The details of RWH and artificial recharge report is given as Annexure-12									

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NOCAP



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)



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Government of India  
Central Ground Water Authority (CGWA)  
Ministry of Water Resources, River Development and Ganga Rejuvenation  
Applications for Issue of NOC to Abstract Ground Water (NOCAP)

**Application for Permission to Dewater Ground Water for Mining Industry  
(Application for New NOC)**

Application Number : 21-4/2146/DR/MIN/2018

21. TOR/ECI/Approval letter from statutory bodies viz Ministry of Environment & Forest (MoEF) or State Pollution Control Board (SPCB) or State Level Expert Appraisal Committee(SEAC) or State Level Environment Impact Assessment Authority (SLEIAA)- (S)  
Attached Referral Letter No Record Found!  
Letter Number TOR from MOEF and CC is enclosed as Annexure-13

22. Have you Applied Earlier for the Same Purpose with CGWA / State Ground Water Authority:  
If Yes, so Details thereof with Status:  
Application for groundwater withdrawal out side the mine pit was applied earlier and NOC for the same is obtained for the same vide letter no. 21-4(314)/SER/CGWA/2011-724 dated 5th May 2018.  
Application for dewatering of ground water from the mine pit is applied herewith.

**MINING USE- Self Declaration**

It is to Certify that the Data and Information Furnished Above are True to the Best of My Knowledge and Belief and I am Aware that if any Part of the Data / Information Submitted is Found to be False or Misleading at any Stage the Application will be Rejected Out Rightly.

1. Applicant Proforma is subject to modification from time to time.  
2. Application should be submitted to Regional Office.  
Regional Director, Central Ground Water Board South Eastern Region, Bhubal Bhawan, Khandagiri Square, NH-5, Bhubaneswar, KHORDHA, ODISHA, 750001  
3. Incomplete Application will be Summarily Rejected.  
Submitted Application will not be Processed till the Print Out of the Signed Complete Application is Submitted to Regional Office.  
4. Applicant has to Submit Processing Fee of Rs. 1000.00/- (Rupees One Thousand Only) through NON TAX RECEIPT PORTAL (<http://bharatkosh.gov.in>). A receipt will be generated. Please fill in the Transaction Ref No. and Date from the receipt. In print out of application and attach receipt along with hard copy of application.  
Bharatkosh Details:-  
Transaction Ref Number:-  
Date:-

Note:- The Processing Fee is Non-Refundable. Applicant should ensure and Check Eligibility of Submission of Application and Required Documents before Submitting Online Application.

**Attached Files:**

1). Site Plan : (Refer 3)  
No Attachment Found!

2). Approved Mining Plan : (Refer:2)

S.No	Attachment Name	File Name
1	Annexure-2	Annexure-2.pdf
2	Annexure-1	Annexure-1.pdf
3	Annexure-3	Annexure-3.pdf
4	Annexure-4a	Annexure-4a.jpg
5	Annexure-4b	Annexure-4b.docx

3). Toposketch of Surroundings 10 km Radius Outside : (Refer: 3)  
No Attachment Found!

4). Document of Ownership of the land : (Refer-7)  
No Attachment Found!

11/14/2018

NOCAP

5). Source of Availability of Surface Water : (Refer: 10)  
No Attachment Found!

6). GroundWater flow Direction Map : (Refer: 13-C)  
No Attachment Found!

7). Proposed Utilization of Pumped Water : (Refer: 16)  
No Attachment Found!

8). Monitoring of Groundwater Regime Map : (Refer: 17)  
No Attachment Found!

9). GW Level of Observation Wells / Piezometer : (Refer: 17-C)  
No Attachment Found!

10). General Quality of Ground Water in the Area : (Refer: 17-F)

S.No	Attachment Name	File Name
1	Annexure-7	Annexure-7.pdf
2	Annexure-5	Annexure-5.docx
3	Annexure-6	Annexure-6.docx

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NOCAP



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 : 13/11/2018

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Application Number	Agency	Project/Block	Change Password	Profile
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Government of India  
Central Ground Water Authority (CGWA)  
Ministry of Water Resources, River Development and Ganga Rejuvenation  
Applications for Issue of NOC to Abstract Ground Water (NOCAP)

Application for Permission to Dewater Ground Water for Mining Industry  
(Application for New NOC)

Application Number : 21-4/2146/OR/MIN/2018

11). Hydrogeological Report (Previous: Groundwater Availability Report) : (Refer: 19)

S.No	Attachment Name	File Name
1	Annexure-9	Annexure-9.pdf
2	Annexure-10	Annexure-10.pdf

12). Main Water Harvesting/Artificial Recharge proposal (Previous: Details of Rainwater Harvesting and Artificial Recharge Measures) : (Refer: 20)

S.No	Attachment Name	File Name
1	Annexure-12	Annexure-12.pdf

13). Authorization Letter (Previous: Authorization) :

S.No	Attachment Name	File Name
1	Annexure-14	Annexure-14.pdf

15). Extra Attachment :

S.No	Attachment Name	File Name
1	Annexure-11	Annexure-11.doc

16). Scanned Mining Application :

No Attachment Found!

17). TOR/EC/Approval Letter :

S.No	Attachment Name	File Name
1	Annexure-13	Annexure-13.pdf
2	Annexure-8	Annexure-8.pdf

Date : 14-11-2018  
Place : Nadidih.

Associated User : biconadidih  
Submitted By User : biconadidih  
Submission Date : 14/11/2018

Name & Signature of the applicant  
(With official seal)  
Nadidih Iron & Mn Mine  
M/s. B. I. Co. Ltd.

\* In case signed by any authorized signatory, the details of the signatory with the authorization shall be enclosed.

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**Proposal for Reduction of water consumption in Nadidih Iron & Manganese mine over the year.**

**Target for Reduction of water consumption reduction in water sprinkling on haul road:** Water sprinkling is one of the most vital in the mine and carry the largest share of water consumption in Nadidih Iron & Manganese mine. Any effort to reduce water consumption is mainly resolve around reducing dependence on fresh water for road sprinkling.

**Steps already taken for reduction of water consumption.**

For reduction in fresh water consumption, the treated water from the STP is being utilized for Road sprinkling in the mine.

Specific water consumption is maintained to minimum by **installation of time switch** in water pipeline used in sprinkling on haul road.

Fogging system has been introduced to control dust with minimum water requirement in crushing and screening plants.



Sewage treatment plant installed in the mine



Dry fog system installed in mobile crushing and screening plant

**Additional measures proposed for reduction of fresh water consumption for road sprinkling.**

- ✓ Application of dust binder such as Hygroscopic  $MgCl_2$  or any other suitable chemical mainly having safer ( Lethal dose 50) LD50 value will be utilised to reduce dependence fresh water consumption over the year.

**The second most use of water** is for plantation purpose. In dump area miyawaki plantation has been done with mulching facility. This has considerably reduced the fresh water need for plantation in this area , Because mulching such as laying paddy straw on planted land hold moisture and prevent runoff and excess evaporation thereby reducing soil water consumption.



Miywaki Plantation in Nadidih Iron & Manganese mine

**Rainwater harvesting & water conservation:** Rainwater harvesting has already been done in the mine. A structure of **16,485 m<sup>3</sup>** capacity has been developed by collecting runoff water from strategic point in the mine during rainy season. Besides settling tanks in strategic locations have been constructed which also recharge the ground water as well used for water

sprinkling purpose in non rainy days. The details of settling tanks constructed are as follows

Sl.No	Reservoir	Area in sq.m	Seepage factor in mm	No.of day	Annual Volume of recharging in m <sup>3</sup>
1	Boundary Pit	24230	1.4	150	5088.3
2	Top Pit-2	15220	1.4	150	3196.2
3	Pit-3	3730	1.4	150	7833.0
4	Settling Pits	1388	1.4	150	292
5	Rainwater Harvesting Pond	4120	1.4	180	1038
<b>Total</b>					<b>17447</b>



Rain water harvesting pit made in the mine



Settling tanks constructed in the mine

Presently the mines has two active quarry with two (2) nos.of pits i.e. Top-2 quarry & Boundary Pit. Rain falling over the entire pits flows downwards towards the bottom of the pits and are by default being harvested and stored in the bottom. Moreover, surface runoff being generated from the surrounding of the pits area being channelized to the pit bottom for storage. Total area (catchment area) for these two pits is 42.180 hectares (421800 sq.m). The harvested rainwater is being used for dust suppression & green belt development in addition to recharge of ground water system naturally through the bottom.



View of top-w and boundary quarry having stored surface run off

## ANNEXURE- XII

Details of the activities with budgetary provision for Corporate Environment Responsibility (CER)

Sl. No.	Activities	Amount on yearly basis in Rs. (lakhs)
1	Water sprinkling on haul roads (within and outside mining lease) for dust suppression.Hiring Cost of water tankers (05 nos.)	45.00
2	Construction of Bridge over Karo River for better communication of Rengalbeda/Nadikasira & Kalta villagers	60.00 (one time)
3	Educational facilities in schools such as distribution of educational kit, school uniform, classroom infrastructure and financial assistance to school teachers	13.35
4	Skill development such as training on livelihood generation, training on sanitary and electrical work	2.00
5	Toilet construction in Ashram School, Kasira and Kasturba Girls Hostel , Bhanjpalli	4.00 (one time)
6	Maintance of existing rain water harvesting system-desilting and minor repairs	0.50
7	Maintenance of existing Drinking water facilities through deep bore wells and OHT pipe lines in nearby villages	14.60
8	Promotion of agriculture such as providing seed, fertilizers and organization of different need based awareness programme covering the required target groups.	2.00

9	Health care facilities for villagers such as free ambulance facility, medical check-up and free medicines	7.20
10	Annual maintenance of Plantation	1.50
11	Repairing of garland drain, retaining wall and coir matting on dump slope	1.50
12	Recurring cost for Ambient air, fugitive dust, surface water, ground water and ambient noise monitoring	2.5
13	Annual free supply of fruit bearing plant to villagers	1.0
14	Cost of free electricity supply	2.00
		157.15

ANNEXURE-XIII

Specific TOR: Recommendation of CSIR-NEERI Report on "Carrying Capacity Study for Environmentally Sustainable Iron and Manganese Ore Mining Activity in Keonjhar, Sundargarh and Mayurbhanj Districts of Odisha State "

Sl. No.	Condition	Compliance
1	Department of Steel & Mines, Govt. of Odisha should prepare 5 years regional plan for annual iron ore requirement from the state, which in turn shall be met from different mines/zones (e.g. Joda, Koira) in the state. Accordingly, sustainable annual production (SAP) for each zone/mine may be followed adopting necessary environmental protection measures.	PP will follow the direction/guidance given by the State Govt. in the matter.
2	The expansion or opening of new manganese ore mines may be considered only when the actual production of about 80% is achieved. Further, the mines that have not produced Mn ore for last two years and have no commitment in the current year as well; EC capacity in such cases may be reviewed. The Department of Steel & Mines, Govt. of Odisha shall submit the Annual Report on this issue to the MoEF&CC for further necessary action.	Noted.
3	Analysis of baseline environmental quality data for the year 2014 and 2016 indicates that existing mining activities appear to have little/no potential impact on environmental quality, except on air environment, which was mainly due to resuspension of road dust. Therefore, all the working mines can continue to operate with strict compliance to monitoring of environmental quality parameters as per EC and CTE/CTO conditions of the respective mine and	The mine is presently under operation by complying all the conditions of CTE/CTO stipulated by SPCB, Odisha. Indian Bureau of Mines is also monitoring the compliance of all the conditions given in MP & PMCP. Regional Office of the MOEF&CC, Bhubaneswar is also monitoring compliance of EC conditions time to time.

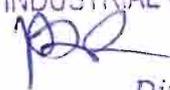
For BONAL INDUSTRIAL CO. LTD.



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	<p>implementation of suggested measures for control of road dust and air pollution. Odisha State Pollution Control Board has to ensure the compliance of CTE/CTO. Regional office of the MoEF&amp;CC, Bhubaneswar shall monitor the compliance of the EC conditions. Regional office of the Indian Bureau of Mines (IBM) shall monitor the compliance of mining plan and progressive mine closure plan. Any violation by mine lease holder may invite actions per the provisions of applicable acts.</p>	
4	<p>Considering the existing environmental quality, EC capacity, production rate, iron ore resources availability and transport infrastructure availability, the share of Joda and Koira sector works out to be 70% and 30% respectively for the existing scenario for the year 2015-16. However, for additional EC capacity, it can be 50:50 subject to commensurate infrastructure improvement (viz SOTM, pollution free road transport, enhancement of rail network etc.) in the respective regions.</p>	Agreed.
5	<p>Continuous monitoring of different environmental quality parameters as per EC and CTE/CTO conditions with respect to air, noise, water (surface &amp; ground water) and soil quality in each region shall be done. The environmental quality parameters should not indicate any adverse impact on the environment. Monitoring within the mines should be done by individual mine lease holders, whereas outside the mine lease area, monitoring should be done by the Govt. of Odisha through various concerned</p>	<p>Monitoring of Ambient air quality, Fugitive dust, noise quality, River water quality (upstream and downstream) and ground water quality is being done in and outside the mine lease area as per the conditions of EC/CTO conditions. This will be continued.</p>

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departments/authorized agencies. Various monitoring/studies should be conducted through national reputed institutes; NABET/MoEF&CC accredited laboratories/organizations. The reports submitted by individual mine lease holders and study reports prepared by other concerned departments/agency for each of the regions should be evaluated and examined by SPCB/MoEF&CC.

6 Construction of cement concrete road from mine entrance and exit to the main road with proper drainage system and green belt development along the roads and also construction of road minimum 300 m inside the mine should be done. This should be done within one year for existing mines and new mine should have since beginning. The concerned departments should extend full support; wherever the land does not belong to the respective mine lease holders. The Department of Steel & Mines, Govt. of Odisha should ensure the compliance and should not issue the Mining Permits, if mine lease holder has not constructed proper cement concrete road as suggested above.

We shall construct cement concrete road from mine entrance and exit to the main road NH 215 with drainage system and green belt within one year. An Undertaking in this regard is enclosed as Annexure - VII.

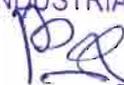
7 In view of high dust pollution and noise generation due to road transport, it is proposed to regulate/guide the movement of iron and manganese ore material based on the EC capacity of the mines. Accordingly, ore transport mode has been suggested, as given below in Table.

**Table: EC Capacity based Suggested Ore Transport Mode (SOTM)**

Code	EC	Suggested Ore Transport Mode
SOTM1	≥	100 % by private

Nadidih Iron & Mn. Mines of M/s. Bonai Industrial Co. Ltd. is a non-captive mine having validity of lease period upto 31.03.2020. The ore produced from the mine is dispatched to different consumer industries through different public Railway sidings. The public Railway sidings are located at a far distance, the nearest being Barsuan at a distance of 38 km from the mine. It is not feasible to construct conveyor belt system for transport of iron ore from the mine to

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	5MTPA	railway siding or conveyor belt up to public railway siding or pipeline for captive mines and 70% for non-captive mines.
SOTM2	Between 3 and <5MTPA	Minimum 70% by Public railway siding, through conveyor belt and maximum 30% by road - direct to destination or other public railway siding or above option.
SOTM3	Between 1 and <3MTPA	Minimum 70% by Public railway siding, and maximum 30% by road - direct to destination or other public railway siding or above option.
SOTM4	<1 MTPA	100% by 10/17 Ton Trucks or above options

It is mentioned by State Govt. of Odisha that currently about 45% of the iron ore is despatched using rail network and progressively it will be increased to about 60% by rail/slurry over a period of 5 years, taking into account time required to set up more railway sidings.

In view of present ore transport practices and practical limitations, all the existing mines should ensure adoption of SOTM within next 5 years. New mines or mines seeking expansion should incorporate provision of SOTM in the beginning itself, and should have system in place within next 5 years.

However, the State Govt. of Odisha shall ensure

different Railway sidings due to problem in acquisition of private (including ST land), involvement of forest land, involvement of huge expenditures on this account as well as less availability of time since the mining lease period is valid upto 31.03.2020 only.

The expansion of the mine is coming under SOTM I. We have requested the State Govt. of Odisha for obtaining information on the initiatives taken by them in this regard. Copy of the letter is annexed as Annexure - IV. We are pursuing the matter with the State Govt. and will submit the details immediately after obtaining the required information.

For BONAI INDUSTRIAL CO. LTD.



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dust free roads in mining areas wherever the road transportation of mineral is involved. The road shoulders shall be paved with fence besides compliance with IRC guidelines. All the roads should have proper drainage system and apart from paving of entire carriage width the remaining right of way should have native plantation (dust capturing species). Further, regular maintenance should also be ensured by the Govt of Odisha.

Transportation of iron & manganese ore through river (Jetty) to nearest Sea port (Sea cargo option) may be explored or connecting Sea ports with Railway network from the mines to be improved further so that burden on existing road and rail network and also pollution thereof can be minimized.

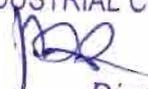
Progress on development of dust free roads, implementation of SOTM, increased use of existing rail network, development of additional railway network/conveyor belt/pipelines etc. shall be submitted periodically to MoEF&CC.

Responsibility: Department of Steel & Mines, Govt of Odisha; Time Period: 5 Years for developing railway/conveyor belt facilities.

8 Development of parking plazas for trucks with proper basic amenities/facilities should be done inside mine. This should be done within one year for existing mines and new mines should have since beginning. Small capacity mines (in terms of lease area or production) not having enough space within the mine lease areas should develop parking plaza at a common place within the region with requisite facilities.

As the mining lease area is small, there is no space available within the mine to develop parking plaza. Though the trucks entering into the mine for taking load are accommodated inside the mine, but for better management, parking plaza common for cluster of mine may be developed by the district administration from DMF fund.

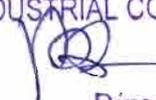
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	Responsibility: <b>Individual Mine Lease Holders</b> ; Time Period: 1 years	
9	Construction of NH 215 as minimum 4 lane road with proper drainage system and plantation and subsequent regular maintenance of the road as per IRC guidelines. Construction of other mineral carrying roads with proper width and drainage system along with road side plantation to be carried out. Responsibility: Department of Steel & Mines with PWD/NHAI Time period: 2 years.	The NH 215 (4 lanes) is under construction by NHAI.
10	Regular vacuum cleaning of all mineral carrying roads aiming at "Zero Dust Re- suspension" may be considered. Responsibility: PWD/NHAI/ <b>Mine Lease Holders</b> ; Time Period: 3 months for existing roads.	Mine Management will make necessary arrangement to arrest " zero dust re- suspension" within three months. An undertaking regarding the same is enclosed as Annexure - VI.
11	Expansion of existing mines and new mines should be considered after conducting recent EIA study (as per the provisions of EIA Notification 2006, as amended time to time) with proper justification on demand scenario for iron ore requirement and availability of pollution free transport network in the region. Responsibility: IBM, Department of Steel & Mines and MoEF&CC, New Delhi	Agreed.
12	<b>Mine-wise allocation of Annual Production:</b> In case the total requirement of iron ore exceeds the suggested limit for that year, permission for annual production by an individual mine may be decided depending on approved EC capacity (for total actual dispatch) and actual production rate of individual mine during last year or any other criteria set by the State Govt., i.e. Dept. of Steel &	Agreed.

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Mines. Department of Steel and Mines in consultation with Indian Bureau of Mines -RO should prepare in advance mine-wise annual production scenario as suggested in Table, so that demand for iron ore can be anticipated, and actual production/dispatch does not exceed the suggested annual production.

Table: Allocation of Production to Different Mines for 5 Years (as per approved Mining Plan)\*\*

**13 Expansion of Existing Mines having validity up to 2020:**

In view of implementation of MMDR Act 2015, wherein many non-captive mines are expected to be closed by March 2020, total iron ore production scenario has been. It is expected that the non-captive mines having validity till 2020 shall try to maximize their production (limited to EC capacity) in the remaining period. Further, depending upon availability of iron ore resources, these mines may also seek expansion of EC capacity. It may be noted here that total EC capacity of existing 25 working mines having validity up to 2020 is about 85 MTPA, where as actual production from these mines has been only 44.677 MT (52.6%) during 2015-16 and 57.07 MT (67.1%) during 2016-17. Also, it is expected that these mines would not even be able to achieve ore production as per existing EC capacity till March 2020. Therefore, these existing mines should go for production to the fullest extent to meet the requisite demand from the State. However, where EC limit is exhausted, application for expansion may be considered. Further, the EC process (i.e. Grant of TOR, Baseline data collection, Mining plan/scheme approval, Public hearing, preparation of EIA/EMP report. Appraisal by the

Not Applicable.

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<p>EAC and grant of EC) takes about one year time. Under such circumstances, it is suggested that further application for grant of TOR or grant of EC for expansion of production capacity of the mine should be considered for those existing mines, which have exhausted their capacity subject to consideration of all environmental aspects. Responsibility: Department of Steel &amp; Mines and MoEF&amp;CC, New Delhi</p>	
<p><b>14 Sustained Iron Ore Production beyond 2020:</b> Considering the implementation of MMDR Act 2015, total production of iron ore in Odisha State is anticipated to be about 111 MT during 2016-17 (actual production was - 102.663 MT), 136 MT during 2017-18, 146 MT during 2018-19 and 146 MT during 2019-20. Then there will be substantial drop in total production (to the tune of 73 MT during 2020-21 onwards) due to closure of mines, which are valid up to 2020. Therefore, in order to maintain operation/sustained growth of downstream industries, iron ore mining in the region needs to be continued at a sustainable rate. The State Govt. through Department of Steel and Mines should initiate appropriate action to ensure continued availability of iron ore from the region, as per suggested sustainable annual production.</p>	Not Applicable
<p><b>15 Reserves Estimation - Mining Plan and Exploration:</b> Appropriate actions (geo-technical investigation for qualitative and quantitative resource estimation &amp; other preparations for auction of mines), may be initiated taken into account the existing working mines, and the mines which were operational at some point of time (but closed presently due to various reasons). The total iron ore reserves/resources available within the</p>	Not Applicable.

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total lease area of each mine should be estimated by State Govt./NMET/GSI (or any other approved agency) with respect to: (i) Total lease area of mine (surface) (ii) Maximum depth to which resources could be available (iii) Resources below the ground water table (if intersected) (iv) Reserves are to be estimated as per UNFC code with respect to quantity and quality (% Fe content) (v) Maximum mining rate and area for auction (after 2020) will be calculated based on total resources available and proposed life of mine leading to closure of mine in a stipulated time period.

Responsibility: Department of Steel & Mines, IBM and GSI; Time frame: 1 year for the mines to be auctioned for next 2 years. The above mentioned organizations shall ensure the compliance with respect to timelines for Implementations.

16 Depending upon availability of extractable iron ore resources within a mine, mining below the ground water table may be permitted after conducting necessary geological and hydro-geological study by GSI and requisite approval from the CGWB/CGWA (Central Ground Water Board/Authority). This can be explored at least in few mines on trial/pilot basis. Further, within a mine. It will be desirable to operate one pit at a time and next pit should be opened after extracting maximum possible resources from the first pit, so that the exhausted pit can be used for back filling/ storing of low grade iron ore. However, depending upon the quantity and/or quality of iron/ manganese ore, other mine pits in the same mine lease may also be opened for sustainable scientific mining, as per approved

The extraction of iron ore from the pits shall be done strictly as per the approved Mining Plan/Review of Mining plan approved by IBM. Details mentioned in point no. 24.

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	mining plan/scheme of mining by IBM. The Department of Steel & Mines, Govt. of Odisha should initiate the pilot project so that minerals are fully utilized.	
17	Commercial Utilization of Low Grade Ore: R&D studies towards utilization of low-grade iron ore should be conducted through research/academic institutes like IMMT, Bhubaneswar, NML, Jamshedpur, and concerned metallurgical departments in IITs, NITs etc., targeting full utilization of low-grade iron ore (Fe content up to 45% by 2020 and up to 40% by 2025). In fact, life cycle assessment of whole process including environmental considerations should be done for techno-economic and environmental viability. R&D studies on utilization of mine wastewater having high concentration of Fe content for different commercial applications in industries such as cosmetics, pharmaceutical, paint industry should also be explored. Responsibility: IBM, Dept. of Steel & Mines, Individual Mine Lease Holders	The necessary studies on commercial utilization of low grade iron ore has been done by IMMT (Bhubaneswar), IIT Kharagpur & IBM Nagpur etc. for upgradation of quality of low grade iron ore through wet beneficiation process. A wet beneficiation plant of 0.5 million TPA capacity has been installed and is under operation where low grade of iron ore is upgraded through this process.
18	The mining activity in Joda-Koira sector is expected to continue for another 100 years, therefore, it will be desirable to develop proper rail network in the region. Rail transport shall not only be pollution free mode but also will be much economical option for iron ore transport. The rail network and/or conveyor belt system up to public railway siding needs to be created. The total length of the conveyor belt system/ rail network	Not Applicable, as the mining lease is valid upto 31.03.2020 only.

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	<p>to be developed from mines to nearest railway sidings by 11 mines in Joda region is estimated to be about 64 km. Similarly, in Koira region, total length of rail network/ conveyor system for 8 mines (under SOTM 1 &amp; 2) is estimated to be around 95 km. Further, it is suggested to develop a rail network connecting Banspani (Joda region) and Roxy railway sidings in Koira region. Responsibility: Dept. of Steel &amp; Mines, Govt. of Odisha and Concerned Mines along with Indian Railways. Time Period: Maximum 7 years (by 2025). The Department of Steel &amp; Mines, Govt. of Odisha should follow-up with the concerned Departments and railways so that proposed proper rail network is in place by 2025.</p>	
19	<p>State Govt. of Odisha shall make all efforts to ensure exhausting all the iron &amp; manganese ore resources in the existing working mines and from disturbed mining leases/zones in Joda and Koira region. The criteria suggested shall be applicable while suggesting appropriate lease area and sustainable mining rate. Responsibility: Dept. of Steel &amp; Mines, Govt. of Odisha</p>	Not Applicable.
20	<p>Large and medium mine leases contribute to better implementation of reclamation and rehabilitation plans to sustain the ecology for scientific and sustainable mining. The small leases do not possess scientific capability of environmentally sustainable mining. Therefore, new mine leases having more than 50 ha area should be encouraged, as far as possible. This will ensure inter-generational resource availability to some extent. Responsibility: Dept. of Steel &amp; Mines, Govt. of Odisha</p>	Not Applicable.

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Mining Operations/Process Related: (i) Appropriate mining process and machinery (viz. right capacity, fuel efficient) should be selected to carry out various mining operations that generate minimal dust/air pollution, noise, wastewater and solid waste.

e.g. drills should either be operated with dust extractors or equipped with water injection system. (ii) After commencement of mining operation, a study should be conducted to assess and quantify emission load generation (in terms of air pollution, noise, waste water and solid waste) from each of the mining activity (including transportation) on annual basis. Efforts should be made to further eliminate/ minimize generation of air pollution/dust, noise, wastewater, solid waste generation in successive years through use of better technology. This shall be ensured by the respective mine lease holders. (iii) Various machineries/equipment selected (viz. dumpers, excavators, crushers, screen plants etc.) and transport means should have optimum fuel/power consumption, and their fuel/power consumption should be recorded on monthly basis. Further, inspection and maintenance of all the machineries/ equipment/ transport vehicles should be followed as per manufacturer's instructions/ recommended time schedule and record should be maintained by the respective mine lease holders. (iv) Digital processing of the entire lease area using remote sensing technique should be carried out regularly once in 3 years for monitoring land use pattern and mining activity taken place. Further, the extent of pit area excavated should also be demarcated based on

(i) Wet drilling machines are used to mitigate dust emission during mining operations.

(ii) This is running mine. Regular environmental monitoring is being carried out to assess air pollution, noise, and water pollution. Protective measures are being carried out if higher values is reported.

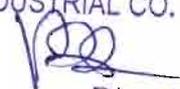
(iii) Emission load quantification is being done and submitted in the EIA/EMP report

(iii) The machineries/equipments are maintained properly and the fuel consumption is recorded on daily basis.

(iv) Conditional monitoring of all HEMM is being done regularly to check and rectify machine health.

(iv) Digital processing of the entire lease area using remote sensing techniques has been carried out and the same has been submitted to the Regional Office of Ministry of Environment, Forests and Climate Change located at Bhubaneswar.

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	<p>remote sensing analysis. This should be done by ORSAC (Odisha Space Applications Centre, Bhubaneswar) or an agency of national repute or if done by a private agency, the report shall be vetted/ authenticated by ORSAC, Bhubaneswar. Expenses towards the same shall be borne by the respective mine lease holders. Responsibility: Individual Mine Lease Holdersii</p>	
22	<p><b>Air Environment Related:</b> (i) Fugitive dust emissions from all the sources should be controlled regularly on daily basis. Water spraying arrangement on haul roads, loading and unloading and at other transfer points should be provided and properly maintained. Further, it will be desirable to use water fogging system to minimize water consumption. It should be ensured that the ambient air quality parameters conform to the norms prescribed by the CPCB in this regard. (ii) The core zone of mining activity should be monitored on daily basis. Minimum four ambient air quality monitoring stations should be established in the core zone for SPM, PM10, PM2.5, SO2, NOx and CO monitoring. Location of air quality monitoring stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board (based on Emission Load Assessment Study). The number of monitoring locations may be more for larger capacity mines and working in larger area. Out of four stations, one should be online monitoring station in the mines having more than 3 MTPA EC Capacity. (iii) Monitoring in buffer zone should be</p>	<p>(i) Fugitive dust emission mitigated by water sprinkling through static arrangement system. Water sprinkling through water tankers is regularly carried out within lease area where static sprinkling is not available and outside lease area and transporting roads. Mineral handling units viz., Screening and Crushing units having high pressure water atomized system is being installed at all discharging points to control dust emission generated by screening/crushing of the ore.</p> <p>(ii) Monitoring of air quality at four station including one CAAQMS (SPM, PM10, PM2.5, SO2, NOx and CO) locations in the core zone is being done and the same will continue in future.</p> <p>(iii) Environmental Monitoring in buffer zone is being carried out by SPCB accredited laboratory.</p> <p>(iv) Vehicles as well as heavy machineries are regularly monitored and their emission conforms prescribed limit. Only PUCV vehicles are allowed to ply within ML area.</p>

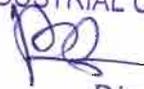
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<p>carried out by SPCB or through NABET accredited agency. In addition, air quality parameters (SPM, PM10, PM2.5, SO2, NOx and CO) shall be regularly monitored at locations of nearest human habitation including schools and other public amenities located nearest to source of the dust generation as applicable. Further, 11 continuous air quality monitoring systems may be installed in Joda and Koira regions and one in Baripada/Rairangpur region. (iv) Emissions from vehicles as well as heavy machinery should be kept under control and regularly monitored. Measures should be taken for regular maintenance of vehicles used in mining operations and in transportation of mineral. (v) The vehicles shall be covered with a tarpaulin and should not be overloaded. Further possibility of using closed container trucks should be explored for direct to destination movement of Iron Ore. Air quality monitoring at one location should also be carried out along the transport route within the mine (periodically, near truck entry and exit gate). Responsibility: <b>Individual Mine Lease Holders and SPCB.</b></p>	<p>(v) All the trucks carrying iron ore to outside the mining lease area are properly covered with tarpaulin. No overloading is permitted.</p>
<p>23 Noise and Vibration Related: (i) Blasting operation should be carried out only during daytime. Controlled blasting such as Nonel, should be practiced. The mitigation measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented. (ii) Appropriate measures (detailed in Section 5.4) should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs/muffs. (iii) Noise levels should be monitored regularly (on weekly basis) near the</p>	<p>Being Complied.</p> <p>(i) Blasting operation is being carried out in day time. Controlled blasting such as Nonel is being used for blasting. Rock breakers are being used to avoid blasting there by reducing vibration and fly rocks.</p> <p>(ii) All the HEMM are put to conditional monitoring for</p>

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<p>major sources of noise generation within the core zone. Further, date, time and distance of measurement should also be indicated with the noise levels in the report. The data should be used to map the noise generation from different activities and efforts should be made to maintain the noise levels with the acceptable limits of CPCB (CPCB, 2000) (iv) Similarly, vibration at various sensitive locations should be monitored at least once in month, and mapped for any significant changes due to successive mining operations. Responsibility: Individual Mine Lease Holders.</p>	<p>reduction of noise level.</p> <p>(iii) Workers engaged in the noise prone area have been provided with ear plugs/ ear muff/ Driver operate their vehicles from vehicle cabin to minimize the impact of noise. The noise level are being regularly monitored and maintained below 85 d BA.</p> <p>iv. Vibration monitoring shall be done in the mine.</p>
<p>24 Water/Wastewater Related: (i) In general, the mining operations should be restricted to above ground water table and it should not intersect groundwater table. However, if enough resources are estimated below the ground water table, the same may be explored after conducting detailed geological studies by GSI and hydro-geological studies by CGWB or NIH or institute of national repute, and ensuring that no damage to the land stability/ water aquifer system shall happen. The details/ outcome of such study may be reflected/incorporated in the EIA/EMP report of the mine appropriately. (ii) Natural watercourse and/or water resources should not be obstructed due to any mining operations. Regular monitoring of the flow rate of the springs and perennial nallas should be carried out and records should be maintained.</p> <p>Further, regular monitoring of water quality of nallas and river passing thorough the mine lease area (upstream and downstream locations) should be carried out on monthly basis. (iii) Regular</p>	<p>(i)At present mining operation is at an RL of 512 m. which is proposed to touch RL of 501m up to the plan period of 2018-19 and at an RL 483 m up to plan period 2019-20. As the ground water table is at an RL of 502m, the mine working will intersect the ground water table. A detailed "Hydro Geological study Report" has been prepared by Indian Institute of Technology (ISM) Dhanbad for the same. Online application has been submitted to CGWA on 14.11.2018 for issue of NOC to Abstract Ground Water.</p> <p>(ii)There is no natural water course present within the lease area. Regular monitoring of flow rate of Karo river is being monitored and records are maintained. Monthly monitoring of upstream and downstream of Karo river which is flowing at a distance of 0.30 Km from the lease is being monitored as per CPCB standard. (iii)&amp; (iv) &amp; (v)</p>

For BONAI INDUSTRIAL CO. LTD.



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monitoring of ground water level and its quality should be carried out within the mine lease area by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring should be carried out on monthly basis. (iv) In order to optimize water requirement, suitable conservation measures to augment ground water resources in the area should be undertaken in consultation with Central Ground Water Board (CGWB). (v) Suitable rainwater harvesting measures on long term basis should be planned and implemented in consultation with CGWB, to recharge the ground water source. Further, CGWB can prepare a comprehensive plan for the whole region. (vi) Appropriate mitigation measures (viz. ETP, STP, garland drains, retaining walls, collection of runoff etc.) should be taken to prevent pollution of nearby river/other water bodies. Water quality monitoring study should be conducted by State Pollution Control Board to ensure quality of surface and ground water sources on regular basis. The study can be conducted through NABL/ NABET approved water testing laboratory. However, the report should be vetted by SPCB. (vii) Industrial wastewater (workshop and wastewater from the mine) should be properly collected, treated in ETP so as to conform to the discharge standards applicable. (viii) Oil and grease trap should be installed before discharge of workshop effluents. Further, sewage treatment plant should be installed for the employees/colony, wherever applicable. (ix) Mine lease holder should ensure that no silt originating due to mining activity is transported in the surface

Piezometer has been installed inside the mining lease and hourly data of ground water level is recorded and maintained. A rain water harvesting structure of 16,485 m<sup>3</sup> capacity has been developed by collecting runoff water from strategic point in the mine during rainy season. Besides settling tanks in strategic locations have been constructed which also recharge the ground water as well used for water sprinkling purpose in non rainy days.

(vi) & (vii) Karo River is located around 0.3 km at NW direction of the mine lease boundary. All the mining activities have been concentrated at the SE and SW directions of the lease except one OB dump which is located towards northern side of the lease. The total run off from the mine is collected from six different outlets based on the existing run off slope and gradient. The runoff from the western side of the lease is diverted to an existing quarry i.e. Top-2 pit. Run off from the South and SE sides is diverted to another pit viz., Boundary pit. Run off from NE & NW side is collected through garland drain of 2,000 m length at series of settling tanks of capacity 1440 m<sup>3</sup>, 1140m<sup>3</sup>, 504m<sup>3</sup>, 504m<sup>3</sup>, 210m<sup>3</sup> and its overflow is then collected in the rain water harvesting structure of capacity 16,485 m<sup>3</sup>.

One STP of 100 KLD has been constructed in the colony area.

(viii) There is no workshop present inside

water course or any other water body. Appropriate measures for prevention and control of soil erosion and management of silt should be undertaken. Quantity of silt/soil generated should be measured on regular basis for its better utilization. (x) Erosion from dumps site should be protected by providing geo-textile matting or other suitable material, and thick plantation of native trees and Shrubs should be carried out at the dump slopes. Further, dumps should be protected by retaining walls. (xi) Trenches / garland drain should be constructed at the foot of dumps to arrest silt from being carried to water bodies. Adequate number of check dams should be constructed across seasonal/perennial nallas (if any) flowing through the mine lease areas and silt be arrested. De-silting at regular intervals should be carried out and quantity should be recorded for its better utilization, after proper soil quality analysis. (xii) The water so collected in the reservoir within the mine should be utilized for the sprinkling on hauls roads, green belt development etc. (xiii) There should be zero waste water discharge from the mine. Based on actual water withdrawal and consumption/ utilization in different activities, water balance diagram should be prepared on monthly basis, and efforts should be made to optimize consumption of water per ton of ore production in successive years. Responsibility: Individual Mine Lease Holders, SPCB and CGWB.

the lease hence no ETP has been constructed. .

(ix) As described above adequate surface run off management system has been made inside the lease area to make the mine zero discharge. In addition to this, Dumps are covered with coir mat and grass seedling has been broadcasted and plantation has been done. Toe of the dumps are fully surrounded with Retaining wall, garland drain terminating to settling tank. There is no silt load from the mine to the near by surface water body. Further, massive plantation has been done in safety zone, vacant area for control of soil erosion.

(x) As described above dumps are covered with geo textile matting and thick plantation has been made on dump slope along with broadcasting of grass seed.

(xi) & (xii) As described above retaining wall, garland drain and terminating to the settling tanks have been made at the toe of the dumps. No seasonal or perennial nalla is passing through the lease.

(xiii) There is no process waste water discharge from the mine. There is a well laid run off water management plan developed for control of surface run off during monsoon. The same is described above.

Mining process as such does not require water. Water balance diagram is being made for water required for environment

For BONAI INDUSTRIAL CO. LTD.

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		management purpose including water sprinkling on haul road and plantation.
25	<p>Land/Soil/ Overburden Related (i) The top soil should temporarily be stored at earmarked site(s) only and it should not be kept unutilized for long (not more than 3 years or as per provisions mentioned in the mine plan/ scheme). The topsoil should be used for land reclamation and plantation appropriately. (ii) Fodder plots should be developed in the non-mineralised area In lieu of use of grazing land, if any. (iii) Over burden/ low grade ore should be stacked at earmarked dump site(s) only and should not be kept active for long period. The dump height should be decided on case to case basis, depending on the size of mine and quantity of waste material generated. However, slope stability study should be conducted for larger heights, as per IBM approved mine plan and DGMS guidelines. The OB dump should be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas, use of geo textiles should be undertaken for stabilization of the dump. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Proper records should be maintained regarding species, their growth, area coverage etc.</p> <p>(iv) Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from mine operation, soil, OB and mineral dumps. The water so collected can be utilized for watering the mine area, roads, green belt development etc. The drains should be regularly de-silted, particularly after monsoon and</p>	<p>Being done and it will continue as per the approved Mining Plan/Scheme.</p> <p>(i)There is no top soil generation at present as mining is restricted already broken up area.</p> <p>(ii)There is no grazing land at present</p> <p>(iii)OB dumps are being stacked at earmarked site and re handling will be done as per approved mining plan.</p> <p>Dumps are suitably terraced at suitable height</p> <p>Coir matting, broad casting of grass seedling and plantation is being done over dump slope. Species selected are as per the guidelines of Regional office of the MoEF.</p> <p>The plantation details are regularly submitted to the regional office of the MoEF , Bhubaneswar on six monthly basis.</p> <p>(iv)Catch drain, retaining wall, garland drain terminating to the settling tanks have been made on the toe of the dumps. Water collected in these tanks are utilised for road sprinkling during non rainy days. The dimension of garland drain, retaining wall is fixed as per approved mining plan.</p>

For BONAI INDUSTRIAL CO. LTD.



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<p>should be maintained properly. Appropriate documents should be maintained. Garland drain of appropriate Size, gradient and length should be constructed for mine pit, soil. OB and mineral dumps and sump capacity should be designed with appropriate safety margin based on long term rainfall data. Sump capacity should be provided for adequate retention period to allow proper settling of silt material. Sedimentation pits should be constructed at the Corners of the garland drains and desilted at regular intervals. (v) Backfilling should be done as per approved mining plan/scheme. There should be no OB dumps outside the mine lease area. The backfilled area should be afforested, aiming to restore the normal ground level. Monitoring and management of rehabilitated areas should continue till the vegetation is established and becomes self-generating. (vi) Hazardous waste such as, waste oil, lubricants, resin, and coal tar etc. should be disposed off as per provisions of Hazardous Waste Management Rules, 2016, as amended from time to time. Responsibility: Individual Mine Lease Holders.</p>	<p>(v) Back filling is being done as per approved mining plan. Since non of the quarry has been fully matured for back filling, full scale back filling has not yet been commenced.</p> <p>There is no OB dump out side of the mine lease area.</p> <p>(vi) Hazardous waste such as used lubricant is being sold to authorised recycler and authorisation has been obtained from the State pollution Control board, Odisha for disposal of the same.</p>
<p>26 Ecology/Biodiversity (Flora-Fauna) Related: (i) As per the Red List of luck (International Union for Conservation of Nature), six floral species and 21 faunal species have been reported to be under threatened, vulnerable &amp; endangered category. Protection of these floral and faunal species should be taken by the State Forest &amp; Wildlife Department on priority, particularly in the mining zones, If any. (ii) The mines falling within 5-10 km of the Karo-Karampada Elephant corridor buffer need to take precautionary measures during</p>	<p>No threatened, vulnerable &amp; endangered species of flora fauna is reported in the mine lease. However, a site specific conservation plan has been approved by the State Forest Dept. which is being implemented. Further for implementation of Regional Wildlife Management Plan for Sundargarh and Keonjhar district of Odisha as directed by the State Govt., we deposited (Rs. 31,75,765/- with the State Government. For site specific</p>

For BONAI INDUSTRIAL CO. LTD.



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mining activities. The forest and existing elephant corridor routes are to be protected and conserved. Improvement of habitat by providing food, water and space for the elephants is required to be ensured to avoid Man-Elephant conflicts. Though as per the records of State Forest Department, movement of elephants in the Karo-Karampada elephant corridor within 10 km distance from the mines In Joda and Koira is not observed, the Forest Department shall further record and ensure that elephant's movement is not affected due to mining activities. (iii) All precautionary measures should be taken during mining operation for conservation and protection of endangered fauna namely elephant, sloth bear etc. spotted in the study area. Action plan for conservation of flora and fauna should be prepared and implemented in consultation with the State Forest and Wildlife Department within the mine lease area, whereas outside the mine lease area, the same should be maintained by State Forest Department. (iv) Afforestation is to be done by using local and mixed species saplings within and outside the mining lease area. The reclamation and afforestation is to be done in such a manner like exploring the growth of fruit bearing trees which will attract the fauna and thus maintaining the biodiversity of the area. As afforestation done so far is very less, forest department needs to Identify adequate land and do afforestation by Involving local people in a time bound manner. (v) Green belt development carried out by mines should be monitored regularly in every season and parameters like area under vegetation/plantation, type of plantation, type of tree species /grass

conservation plan we have deposited Rs. 91,00,000 for implementation of the site specific plan in the buffer zone. Further we have already spent Rs.75, 02,309/- against a budgetary provision of 32 lakhs . We have also already prepared species specific conservation plan for peacock & Indian python reported in the buffer zone and the same has been submitted along with the report.

For BONAI INDUSTRIAL CO. LTD.



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species/scrubs etc., distance between the plants and survival rate should be recorded. (vi) Green belt is an important sink of air pollutants including noise. Development of green cover in mining area will not only help reducing air and noise pollution but also will improve the ecological conditions and prevent soil erosion to a greater extent. Further, selection of tree species for green belt should constitute dust removal/dust capturing plants since plants can act as efficient biological filters removing significant amounts of particulate pollution. Thus, the identified native trees in the mine area may be encouraged for plantation. Tree species having small leaf area, dense hair on leaf surface (rough surface), deep channels on leaves should be included for plantation. (vii) Vetiver plantation on inactive dumps may be encouraged as the grass species has high strength of anchoring besides medicinal value. (viii) Details of compensatory afforestation done should be recorded and documented by respective forest divisions, and State Forest Department should present mine-wise annual status, along with expenditure details. (Ix) Similarly, Wildlife Department is also required to record and document annual status of wildlife in the region and should identify the need for wildlife management on regional level. (x) Maintenance of the ecology of the region is prime responsibility of the State Forest and Wildlife Department. They need to periodically review the status and identify the need for further improvement in the region. The required expenditure may be met from the funds already collected In the form of compensatory

For BONAI INDUSTRIAL CO. LTD.



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	<p>afforestation and wildlife management. Further, additional fund, If required can be sought from DMF. Responsibility: Individual Mine Lease Holders and State Forest &amp; Wildlife Department.</p>	
27	<p>Socio-Economic Related: (I) Public interaction should be done on regular basis and social welfare activities should be done to meet the requirements of the local communities. Further, basic amenities and infrastructure facilities like education, medical, road, safe drinking water, sanitation, employment, skill development, training institute etc. should be developed to alleviate the quality of life of the people of the region. (ii) Land outees and land losers/affected people, if any, should be compensated and rehabilitated as per the national/state policy on Resettlement and Rehabilitation. (iii) The socio-economic development in the region should be focused and aligned with the guidelines/Initiatives of Govt. of India/ NITI Aayog / Hon'ble Prime Minister's Vision centring around prosperity, equality, justice, cleanliness, transparency, employment, respect to women, hope etc. This can be achieved by providing adequate and quality facilities for education, medical and developing skills In the people of the region. District administration In association with mine lease holders should plan for Samagra Vikas of these blocks well as other blocks of the district. While planning for different schemes In the region, the activities should be prioritized as per Pradan Mantri Khanij Kshetra Kalyan Yojna (PMKKKY), notified by Ministry of Mines, Govt. of India, vide letter no. 16/7/2017-M.VI (Part), dated September 16, 2015. Responsibility: District Administration and</p>	<p>(i)PRA technique is being used for participatory decision making on local area development y the CSR team of the mine. Basic amenities such as education, medical, road, safe drinking water, sanitation, employment &amp; skill development has already been addressed and actions has been done. This has been described in details in page no203 of the EIA/EMP report in item no 6.3.4. Further action to be taken in this regard is described on page 229 to 235 of the EIA &amp; EMP report.</p> <p>(ii)There is no R&amp; R issue in the mine.</p> <p>(iii)We shall extend our support to the Govt. in other socio - economic development programme.</p>

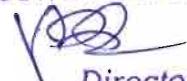
For BONAI INDUSTRIAL CO. LTD.

  
Director

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	Individual Mine Lease Holders.	
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For BONAI INDUSTRIAL CO. LTD.

  
*Director*

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**Road Transport Related:** (I) All the mine lease holders should follow the suggested ore transport mode (SOTM), based on its EC capacity within next 5 years. (ii) The mine lease holders should ensure construction of cement road of appropriate width from and to the entry and exit gate of the mine, as suggested in Chapter 10. Further. Maintenance of all the roads should be carried out as per the requirement to ensure dust free road transport. (iii) Transportation of ore should be done by covering the trucks with tarpaulin or other suitable mechanism so that no spillage of ore/dust takes place. Further. Air quality In terms of dust PM<sub>10</sub> should be monitored near the roads towards entry & exit gate on regular basis, and be maintained within the acceptable limits. Responsibility: Individual Mine Lease Holders and Dept. Of Steel & Mines.

(i) Nadidih Iron & Mn. Mines of M/s. Bonai Industrial Co. Ltd. is a non-captive mine having validity of lease period upto 31.03.2020. The ore produced from the mine is dispatched to different consumer industries through different public Railway sidings. The public Railway sidings are located at a far distance, the nearest being Barsuan at a distance of 38 km from the mine. It is not feasible to construct conveyor belt system for transport of iron ore from the mine to different Railway sidings due to problem in acquisition of private (including ST land), involvement of forest land, involvement of huge expenditures on this account as well as less availability of time since the mining lease period is valid upto 31.03.2020 only.

(ii) We shall construct cement concrete road from mine entrance and exit to the main road NH 215 with drainage system and green belt within one year. Maintenance of transporting road are carried on regularly.

(iii) Presently transporting is carried out by tarpaulin covering transporting vehicles and this will be continued in future too.

We are conducting ambient air quality near entry and exit point of the mine.

For BONAI INDUSTRIAL CO. LTD.

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Director

<p>29 Occupational Health Related: (I) Personnel working In dusty areas should wear protective respiratory devices and they should also be provided with adequate training and Information on safety and health aspects periodically. (ii) Occupational health surveillance program for all the employees/workers (including casual workers) should be undertaken periodically (on annual basis) to observe any changes due to exposure to dust, and corrective measures should be taken Immediately, if needed. (III) Occupational health and safety measures related awareness programs including Identification of work related health hazard, training on malaria, eradication, HIV and health effects on exposure to respirable minerals dust etc., should be carried out for all the workers on regular basis. A full time qualified doctor should be engaged for the purpose. Periodic monitoring (on 6 monthly basis) for exposure to respirable minerals dust on the workers should be conducted, and record should be maintained Including health record of all the workers. Review of impact of various health measures undertaken (at an Interval of 3 years or less) should be conducted followed by follow-up of actions, wherever required. Occupational health centre should be established near mine site Itself. Responsibility: Individual Mine Lease Holders and District Administration (District Medical Officer)</p>	<p>i) Personnel working in the mine are provided protective respiratory devices and are made educated on safety and health aspects periodically by in house training.</p> <p>ii) OHS programme of the workers are undertaken periodically by team of professional doctors engaged by the lessee.</p> <p>iii) A full time doctor along with para-medical staff is already employed.</p> <p>Iv) Initial medical examination and periodical medical examination is being conducted on regular basis. Periodical medical examination is carried out for all employees once in every five years and every three years for employees above the age of 45 years.</p>
<p>30 <b>Reporting of Environmental Sustainability Achievement:</b> All the mines should prepare annual environmental sustainability report (ESR), highlighting the efforts made towards environmental protection with respect to different</p>	<p>Annual environmental statement is being submitted to the Regional Office of MoEF&amp;CC and SPCB and also posted in Company's website</p>

For BONAI INDUSTRIAL CO. LTD.

  
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environmental components vis-a-vis. Production performance of the mine on monthly basis, The data collected as per EC & CTE/CTO conditions should be utilized to prepare the annual sustainability report. The mines performing high with effective environmental safeguards may be suitably recognized/rewarded, 'Star Rating Format' formulated by the Ministry of Mines along with environmental sustainability report may be used.

**31 Environmental Monitoring Requirements at**

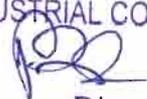
**Regional Level:** Apart from strict Compliance and monitoring by individual mine lease holder, there is a need for simultaneous monitoring in each of the regions by competent expert agencies under the guidance/supervision of concerned regulatory agency. Details of the studies required to be done on regular basis (continuously for 5 years) through responsible agency (organization of national/state repute) and time frame are suggested In Table.

Table: Suggested Environmental Monitoring Requirements and Action Plans at Regional level.

The data so generated for the region should be made available on the website of Department of Steel & Mines and also at MoEF&CC website, so that it can be effectively utilized by Individual Mine Lease Holders for preparing EIA/EMP reports. This will meet the requirement for separate one season baseline environmental quality data collection by the Individual proponents, if the mine proposed Is in the same study region. Further MoEF&CC (through EAC) can also utilize the data base available in

Annual environmental statement is being submitted to the Regional Office of MoEF&CC and SPCB and also posted in Company's website.

For BONAI INDUSTRIAL CO. LTD.



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	<p>evaluating the proposals for expansion of existing mines or new mines while granting ToR or EC to the mine. Taking an holistic view of the region. State Govt. of Odisha should bring out an integrated environmental sustainability report for each of the regions (mainly for Joda and Koira region) incorporating ESR of Individual mines and data collected in the region through various agencies, once in 5 years, to plan level of scientific and sustainable mining for the next 5 years.</p>	
<p>32</p>	<p><b>Institutional Mechanism for Implementation of Environmentally Sustainable Mining:</b> The present study is not a one-time study, but a process to ensure environmentally sustainable mining activities in the region on long term basis. Looking into the large-scale mining activities and long term perspective for mining vis-a-vis environmentally sustainable mining and upliftment of people of the region, there is a need to create an agency, who will integrate all the aspects relating to sustainable mining in the region on long term basis. It could be a SPV of Govt. of Odisha or a cell within the overall control and supervision of Dept. of Steel &amp; Mines, with members from IBM, GSI, OSPCB, MoEF&amp;CC-RO and other concerned Departments and Mine Owners (EZMA), District Administration. It is found that the strong database available for the region needs to be taken into account to map and establish environmental quality of the region on daily, monthly, seasonal and annual basis. Further, the efforts and initiatives of the mines towards environmental protection as well as upliftment of the people of the region are required to be integrated, and a systematic plan at the</p>	<p>Agreed.</p>

For BONAI INDUSTRIAL CO. LTD.



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block/regional level needs to be framed for the overall benefit of the local society, region, district, state and the country as a whole. It will be desirable to have proper environmental quality data management and analysis by NEERI or any other agency for next 5 years (six monthly compliance reports followed by field verification) ensuring sustainable mining practices in the region leading to an overall development of the region. District Mineral Funds should be utilized appropriately for various developmental activities/needs of the region. Further, an environmental sustainability report incorporating environmental status of region coupled with social upliftment may be brought out by SPCB or any other authorized agency on annual basis. This report can be used for supporting the regional EIA study, and also need for environmental quality monitoring by individual mine seeking environmental clearance for new mine/ expansion of mine, including public hearing. Since, outcome of the above study reports shall be in the overall interest of all the stakeholders (including local population) of the region, further planning for the region shall warrant cooperation and assistance of all the stakeholders (mine operators, industries, transporters, State & Central Government Offices, MoEF&CC, CPCB, SPCB, Dept. of Steel & Mines, IBM, IMD, NGOs and local people) in sharing the relevant data/information/ reports/documents etc. to continuously improve upon the environmentally sustainable development plan for economic growth in mining sector as well as for improvement in quality of life of the people of the region.

For BONAI INDUSTRIAL CO. LTD.



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Table: Allocation of Production to Different Mines for 5 Years (as per approved Mining Plan) \*\*

Mine Lease	EC Capacity (MTPA)	Suggested Annual Production (MT)				
		2016-17	2017-18	2018-19	2019-20	2020-21
		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
Mine 1	X1					
Mine 2	X2					
Mine 3	X3					
Mine n	X3					
Total	160+dX	105	129	153	177	201
Next year allocation = Average of EC Capacity and Last Year Production						

Table: Suggested Environmental Monitoring Requirements and Action Plans at Regional level\*\*\*

S.No.	Study Component/Action Plan	Responsibility	Monitoring and Reporting Time Frame (Approx.)
1	Environmental Quality Monitoring with respect to air, water, noise and soil quality in each region (Joda, Koira and Baripada/Rairangpur) as per specified frequency shall be done by a third party (preferably Govt.) and/or laboratory approved/recognized by NABET/CPCB/SPCB/MoEF&CC. All the water bodies (rivers, nallas, ponds etc.) shall be monitored. National/State level research/academic institutes may be involved initially for couple of years to streamline the activity. The report shall be brought out annually by June each year. The study shall be conducted in consultation with MoEF&CC - RO	SPCB	Continuous Annually
	Installation of online ambient air quality monitor for PM10, PM2.5, SOx and NOx within the mine having more than 3 MTPA EC Capacity	Respective Mine Lease Holders	Continuous Annually
	Installation of online ambient air quality monitor for PM10, PM2.5, SOx and NOx in the	SPCB	Continuous

For BONAI INDUSTRIAL CO. LTD.



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	Joda and Koira Region (total 11 location)		Annually
2.	Status of flora and fauna in each of the regions shall be assessed on annual basis. Changes, if any, taking place in the region shall be brought out clearly. The study shall be conducted in consultation with State Forest and Wildlife Department	State Forest & Wildlife Dept.	Annually in mining zone and once in 3 years in the region.
3	Socio-economic study incorporation developments taking place in each of the region, CSR initiatives made by the mining companies shall be conducted on annual basis. Further, micro level developmental needs shall be clearly brought out in the report for each region. The study shall be conducted in consultation with district administration.	Respective District Administration	Annually
4	A detailed hydro-geological study in each of the regions shall be conducted in an integrated manner in consultation with Regional Director, Central Ground Water Board. Accordingly, all project proponents shall implement suitable conservation measures to augment ground water resources in the area.	SPCB	Once in 2 years
5	The State Govt. shall ensure construction and maintenance of dust free common roads/appropriate rail network for transport of ore from mines to the consumer end.	Dept. of Steel & Mines	12 months for road network and 5-7 years for rail network
6	Construction and maintenance of dust free roads from respective mine to the main road	Respective Mine Lease Holders	Continuous-6 months
7.	Traffic/road inspection study addressing the condition of traffic/roads leading to different mines and connecting to different railway sidings shall be undertaken on annual basis. Further, detailed traffic study shall be undertaken on every 5 yearly basis to ensure adequacy of road/rail infrastructure in each of the regions. The study can be undertaken through national/state level research/academic institute (such as CSIR-CRRI, New Delhi)	Dept. of Steel & Mines	Continuous 6 months
8	Assessment of land use/land cover changes in each of the regions, with particular focus on	ORSAC	Annually

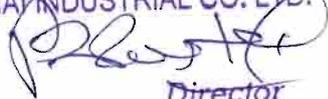
For BONAI INDUSTRIAL CO. LTD.



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Director

	mining areas, afforestation activities, variation in flow path of various water bodies etc. using remote sensing data		
9	R&D Studies for utilization of low-grade iron ore	Dept. of Steel & Mines through R&D / Academic Institutes	Up to 45% by 2020 and up to 40% by 2025

For BONAI INDUSTRIAL CO. LTD.  
  
 Director