ARYAN Mining & Trading Corporation Pvt. Ltd.
(Formerly Aryan Mining & Trading Corporation Ltd.)
CIN : U13100WB1936PTC008817

Ref. No: 954/ AMTC/MoEF&CC/EC/18-19 Dated 29th November 2018

Member Secretary,
Expert Appraisal Committee, (Non-Coal Mining)
IA Division,
Ministry of Environment, Forests & Climate Change,
Vayu-305, Indira Paryavaran Bhawan,
Jorbagh Road, Lodhi Road, New Delhi-110003

Sub: Proposal on "Narayanposi Iron &Mn Ore Mines (349.254 Ha), M/s Aryan Mining & Trading Corporation Pvt. Ltd. for expansion of Iron ore production from 3.0 MTPA to 6.0MTPA (ROM), existing 0.036 MTPA Manganese ore production and setting up of 2.0 MTPA Beneficiation Plant along with Crusher & Screen plants within the mine lease area located in the villages of Koira, Kashira and Kathamala RF, Tehesil Koira, district Sundargarh, Odisha. **File No: J-11015/288/2008-IA-II(M) – Regarding submission of Additional details sought.**

Ref.: Additional Information sought on dated 28.11.2018 on our online proposal no- IA/OR/MIN/41936/2016

Dear Sir,

With reference to the above cited subject, we are herewith submitting the point wise compliance for the Additional Details Sought by MoEF& CC, Govt. of India on dated 28.11.2018 **(attached as Appendix –I)**.

With the above submission we request you to kindly consider our proposal in the upcoming agenda towards recommendation for Environmental Clearance.

Thanking You.

Yours truly,

For Aryan Mining & Trading Corporation Pvt. Ltd.

29/11/2018

General Manager (Geology &Envt.)

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Appendix - I

(i) *The Committee observed that the mine lease is valid only upto 31.03.2020 and the PP has proposed the enhancement of Iron ore from 3 Million TPA to 6 Million TPA and establishment of beneficiation plant with capacity of 2 Million TPA within the mine 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.*

Reply 1: The mine is already well developed and can be expanded immediately after obtaining Environmental Clearance from MoEF& CC and Consent to Operate from State Pollution control board.

The month wise production with other details on expansion is attached as Annexure-1

(ii) The Committee noted that the PP has used the ISCST model for predication of impact of the project on the air quality of the area. Air Quality modelling along with incremental ground level concentration were measured and the predicted incremental concentrations ranged from <0.5 to 5.0 micro gram per cubic meter for PM10, <0.5 to 2.5 micro gram per cubic meter for PM2.5, <0.5 micro gram per cubic meter for SO_2, <0.5 to 5.8 micro gram per cubic meter for NOx, <05 to 4.5 micro gram per cubic meter for CO. The Committee is of the view the PP needs to submit the detailed parameters used in the model as PP has proposed the enhancement of iron ore from 3 Million TPA to 6 Million TPA, however, the incremental ground level concentrations seems less. In view of the above PP needs to redone the Modelling 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.

Reply 2 : Revised Air quality modelling and Ground level concentration predication is carried out for mining and allied activities within the lease area including the ore transportation from the stack yard and also due to mineral transportation outside the lease area and are given in Annexure – 2. Details of parameters used in this model, emission sources, emission rate, results of the Peak GLC's for various environmental parameters without & with control measures are given in this report.

From the model it could be seen that the predicted maximum incremental GLC after expansion, for PM10 within the lease area (A1) is expected to be 8 μg/m³, in the nearby AAQ monitoring locations namely Kashira village (A2) & Koira village (A5) are 6 μg/m³& 6.5 μg/m³ respectively whereas at away places from the active source, the values are getting reduced due to wind dispersion and distance effects.

(iii) PP needs to submit the schedule for the installation of beneficiation Plant as the mine lease is valid up to only 31.03 2020.

Reply 3: Schedule for installation of Beneficiation plant is given in Annexure - 3.

(iv) The Committee observed that the flow Sheet of the beneficiation plant submitted is not adequate and PP needs to submit the detailed flow sheet of Beneficiation plant along with mass / water balance.

Reply 4: Detailed flow sheet of beneficiation plant along with water balance and material balance is given in Annexure - 4.

(v) The Committee observed that the details of Court cases with present status w.r.t. EC and CTO violations has to be submitted along with documentary proof.

Reply 5: Details of court cases with respect to status of EC & status of violation of CTO along with documentary proof are given in Annexure – 5.

(vi) The Ministry has earlier asked the State Government vide letter dated 31.01.2011 to initiate the action against PP under the section 19 of E (P) Act, 1986 w.r.t earlier violations. The actions are not available in the project file. In view of this PP/State Government needs to submit the details of actions to the Ministry's letter dated 31.01.2011 need to be submitted.

Reply 6:

a. **EP Case filed before the court of SDJM, Bonai by the Collector, Sundargarh vide case no. 43/2013.**
b. **Interim stay order passed by the Hon'ble High Court of Odisha, dated 31.10.2014.**
c. **The matter already discussed in common cause and as per the order of the judgement made by the Hon'ble Supreme Court 02.08.2017 in the matter of W.P.(C) 114/2014, dated, DDM, Koira has raised the demand under section 21(5) of MMDR Act, 1957 on EC and FC violations and the same has been complied.**
d. **It is anticipated that the case will be disposed accordingly.**
e. **Besides the above details provided for past EC violation, there is no increase in production by the Lessee in the existing environmental clearance i.e. 3.0 MTPA iron ore & 0.036 MTPA Mn ore.**
   The details are provided in Annexure - 5

(vii) The Occupational Health Surveillance report needs to be submitted by the PP.

Reply 7: Details of occupational health and safety management system implemented by AMTC along with health surveillance report is given as Annexure -6

(viii) The committee has deliberated the point wise compliance of Environmental Clearance. The reports inter- alia mentioned that the project authority has complied or are in Process of complying with the conditions stipulated by the Ministry. The certain information/action plan have been

sought on the following points-

(i) It is required to increase the green belt area by planting more plants during ongoing monsoon period and also put stress to achieve optimum plantation density i.e. 2500 plant per ha in plantation are/non-plantation area including safety zone.

(ii) It is required to clean the all rain water harvesting structure, pit before and after the monsoon,

(iii) It is required to maintained the garland drain, settling tank etc, all around the OB area etc, on regular basis. 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,

Reply 8: Subsequent to inspection of Regional office of MoEF& CC, AMTC has prepared action plan as desired by the inspection officer and the same was submitted to their office. Its details are given in Annexure-7.

(ix) The PP needs to implement the recommendations and necessary arrangement to be made to arrest "zero dust is-suspension".

Reply – 9 ***NH-215 passes through the lease area and is under four lanning. The road is being constructed as per the IRC guidelines with proper drainage system with fencing & plantation. Apart from that 200m concrete road has been made from the exit gate towards stack yard.***

For the effective dust suppression in haulage road fixed - auto water sprinkling arrangement system installed for 2.4 Km. Further additional 3.0 KM length has been proposed. Also 4 numbers of mobile water tankers engaged for sprinkling on the mine benches, mine haul road, loading and unloading and transfer points. Additional 1 no water tanker is proposed for expansion.

We have also proposed to use additives towards effective dust suppression on the mines haulage road. This will further help towards reduction in water consumption. The application will be with due conducting the experiment on availability of certified additives.

On the dispatch road i.e. on NH-215 sweeping is under practice in the purview of our area. Further vacuum cleaning will be adopted as per the instruction from Authorities.

After all whatever the instructions or recommendations will come from MoEF&CC/State Govt. of Odisha, we will abide by it.

(x) 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 6 Million TPA, therefore, SOTM 1 may be applicable to this project and the Ore transport mode should be 100% by private railway siding ore conveyor belt up to public railway siding or pipe line for captive mines and 70% for non-captive mines. In this context PP submitted that they abide the SOTM system as a when guideline form by the Government of Odisha in this regard. The Committee ask the PP to submit the development on the SOTM, if any, made by the Government of Odisha.

Reply –10: ***The first meeting was conducted by all the Govt. respective departments on dated 21.06.2018 under chairmanship of Chief Secretary, Odisha. All the recommendations of NEERI towards its implementation were vividly discussed among team.***

In the meeting it has been decided to form District level Committees for the implementation of Suggested Ore Transport Mode (SOTM) under the chairmanship of District Collectors to decide on the modalities for implementation. It is also decided that, Constraints, if any, in implementation of such recommendations may be reported by the DLC's to the Steel & Mines department.

In the meeting recommendation with regard to new railway lines and railway sidings was forwarded to the Ministry of Railway/Railway Board through Commerce & Transport Department for appropriate action.

On the basis of above, a meeting was conducted by Collector Sundargarh on dated 03.07.2018 with all lessees regarding safe transportation and prevention of pollution of minerals during transportation from mining area to main road and railway sidings.
Annexure - 8

(xi) The PP needs to resubmit action plans on the recommendations of the carrying capacity study.

Reply 11: ***Action plans on the recommendations of the carrying capacity is attached as Annexure - 9***

(Xii) The PP needs to resubmit 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.

Reply 12: Towards water management & reduce in water consumption PP has adopted & will adopt following measures:

a) The proposed beneficiation plant process is totally closed circuit with zero effluent discharge. Nearly 95-97% water can be recovered from the circuit & will recirculate in the circuit.

b) **Rainwater harvesting.**

AMTC has already implemented different RWH measures towards augmentation of the ground water recharge with implementation of Settling ponds, settling pits, Check dams, check weirs, garland drains, diverting the mines run off water to the mines pits.

A detailed mines surface run off and rain Water Harvesting Potential study was carried out by engaging KRG Rain Water Foundation, Chennai in consultation with CGWB, Bhubaneswar. For the study area, it has been calculated that there will be generation of 756339.30 m^3 mines run off considering an average annual rainfall of 1,269 mm within a time span of 120 days of monsoon and its details are given below:

COMPONENT WISE ANNUAL RAIN WATER HARVESTING POTENTIAL

Type of Runoff Catchment Area	**Effective Area (m^2)**	**Runoff Coefficients**	**Volume (m^3)**
Roof Top Area	400	0.75	381
Road & Paved Area	136600	0.50	86673
Green Belt	3491100	0.05	221510
Mine Quarry	3673800	0.05	233102
Ore/ Waste Dump	47250	0.05	2998
Barren Land	1668050	0.10	211675
TOTAL	**9017200**		**756339**

The following methods of water harvesting are carried out:

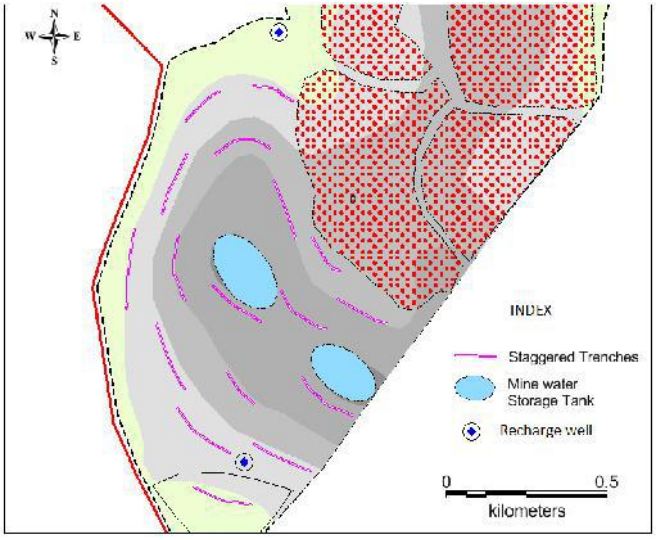
- Rain water harvesting from roof tops of buildings and other super structures for storage. The roof top rainwater is collected and channelized to the recharge well in the camp area, which will recharge groundwater during rainy season.

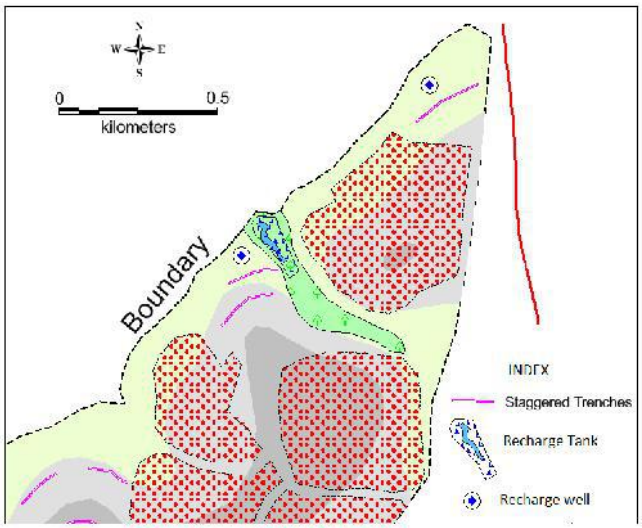
- Suitable storm water drainage system along the roads is provided to collect storm water effectively. The surface runoff collected in the storm water drains are channelized through a series of settling cum percolation ponds before discharged.

- Based on the calculation 756339 CUM mines surface run off is generated from the dumps, stack yards & quarry area, out of which 70% of the surface run off of the dump, stack yard areas quantity is being channelized to the mines pit through surface run-off management structures within the mine itself by guiding the run-off through garland drains of the mine.
- And balance quantity is finally diverted to the percolation cum de-siltation ponds, etc. by proper channels i.e. garland drains, check weirs, check dams, settling pits/ponds & de-silting structures to check the silt carry over into the nearby water bodies.
- In the entire area, where ever possibility of wash off, flow of sediments etc. is anticipated, retaining wall, garland drain, check dam and settling cum percolation ponds have been provided based on the recommendation of the KRG study.
- Staggered trenches of 2m*1m dimension are and will be constructed along the contours so that during sudden storm, good amount of runoff can be harvested which will maintain adequate soil moisture content.
- For effective harvesting of rainwater from the valley in the northern part of the lease area, a recharge tank with overflow system is already provided.
- Four recharge wells comprising 2 each in the northern and southern part were planned of which 2 are already constructed.

- Map showing the rain water harvesting structures separately for southern part and northern part are shown below:

SOUTHERN PART OF THE LEASE AREANORTHERNPART OF THE LEASE AREA





Besides, de-siltation of the following village ponds around the ML area is also undertaken towards rain water harvesting purposes after each monsoon.

Sl.No	DESCRIPTION	CAPACITY IN CUM
1	KASHIRA POND -1	8100
2	KASHIRA POND -2	92400
3	KASHIRA POND -3	13200
5	TUKUTOLA POND -1	43160

Apart from that two settling cum percolation ponds have been proposed i.e. near dump-1 in the year 2018-19 which will be completed on or before February 2019 and near dump-3 in the year 2019-20.

GROUNDWATER RECHARGE WELL AT AMTC CAMP AREA

ROOFTOP RAINWATER CHANNEL

RAIN WATER HARVESTING CUM PERCOLATION POND NEAR MN Q-5

c) **Use of Additives**

We have also proposed to use additives towards effective dust suppression on the mines haulage road. This will further help towards reduction in water consumption. The application will be with due conducting the experiment on availability of certified additives.

Annexure - 1

Calendar planning of the proposed production capacity

YEAR	Month	Quantity(MT)
2019-20	April	606818
	May	606818
	June	606818
	July	381818
	August	381818
	September	381818
	October	606818
	November	606818
	December	606818
	January	606818
	February	606818
	Total	6000000

CALANDER YEAR PRODUCTION PROPOSAL(2019-20)

Total Maximum Excavation as proposed in the approved Mining Plan **per annum**	**Total Excavation per day**
ROM	**ROM**
6.0 Mil	**0.02 Mil.T (20000 T)**
Note : The production will be under taken on pro-rata basis to facilitate the implementation of FMCP	

Existing production : 3.0 MTPA of Iron ore & 0.036 MTPA of Manganese ore

Proposed production : 6.0 MTPA of Iron ore & 0.036 MTPA of Manganese ore

Net Increase : 3.0 MTPA of Iron ore

The mine is being operated on 3 shift basis

S.NO	Description	Existing	Proposed (Expansion)	Net Increase	Remarks
1	Iron ore quantity	3.0 MTPA	6.0 MTPA	3.0 MTPA	
	Manganese quantity	0.036 MTPA	0.036 MTPA	Nil	
2	Drilling				
	a) Drilling meterage per annum	69120 m/Annum	138240 m/Annum	69120 m/Annum	
	b) Drilling meterage per day	231 m / day	461 m/day	231 m / day	
	c) No:of Drill machines required	1 drill machine (100 mm dia) (30 m/Hr)	2 drill machines (100 mm dia) (30 m/Hr)	1 drill machine (100 mm dia) (30 m/Hr)	DP 1100 (sandvik make)
3	Blasting				
	Explosive requirement per annum	300 TPA	600 TPA		
	Explosive requirement per day	1 TPA	2 TPA		Blasting is normally conducted thrice a week
4	Excavation and loading machinery	3 (EX – 400 4.3 Cu.m)	5 (EX – 400 4.3 Cu.m)	2 (EX – 400 4.3 Cu.m)	Excavator Tata Hitachi make
5	Hauling machinery (Dumpers /Tippers)	9 (Volvo Make) 40 T Capacity)	18 (Volvo Make) 40 T Capacity)	9 (Volvo Make) 40 T Capacity)	Volvo make dumpers

EXCAVATION DETAILS FOR 2019-20

Drilling Parameters	Iron Ore Zone
Burden	3.0m
Spacing	3.5m
Bench height	9m
Output / hole	3.0 x 3.5 x 9 = 94.5m^3 or 283.5T
Mineral reject drilling (10%)	0.9m
Depth of the hole including sub grade drilling	9 + 0.9 = 9.9 m
Drill diameter	100mm
Drilling speed	30m /hr.
Working hours in a shift	8
Number of shifts per day	3
Annual working days	300
Expected utilization	80%
Operating efficiency	80%
Meters to be drilled/ drill / annum	30 x 8 x 3 x 300 x 80% x 80% =138240 m
Meters to be drilled / day	461 /day
Meters to be drilled / Hr	28.8 / hr

❖ **Drilling machines required**

Item	Fe-Ore Zone
Volume of excavation during 2019-20	= 6593559 MT
Volume to be loosened through drilling and blasting	= 6593559 x 70% = 4615491T
Annual requirement of holes	= 4615491 / 283= 16309 Nos.
Meterage of drilling required	= 16309 x 9.9= 161460
No. of drills required to be in operation	= 161460 /138240 = 1.16 say 2 Nos

Note : The production will be under taken on pro-rata basis to facilitate the implementation of FMCP

BLASTING:

About 70% of the total production will be blasted. The proposed mining will have 9.0m bench height for iron ore. Drilling will be done for blast hole by 100mm dia DTH in iron ore zone. These holes will be drilled in staggered pattern with burden and spacing of 3.0m and 3.5m respectively. No secondary blasting will be done. Rock breaker will be utilized for the purpose.

Powder factor

A powder factor of 7 tonne of saleable ore per Kg explosive is considered for estimating explosive requirement. However, this may suitably be changed depending upon the type of ore and other site conditions.

TYPE OF EXPLOSIVE TO BE USED:

Blasting will be initiated by detonator & NONEL and safety fuse. The calculation is however made as follows:

Explosive requirement for the year (2019-20)

		Iron ore zone
Max Annual Excavation during 2019 – 20	**=**	**6593559 T**
Production to be obtained from blasting	**=**	**6593559 x 70% = 4615491T**
Powder factor	**=**	**7.0t / kg**
Explosive requirement per annum	**=**	**4615491 / 7**
	=	**659355 Kgs or 659.355 TPA**
Explosive requirement per month		**54946 kgs or 54.946 TPD**
Explosive requirement per day		**2198 kgs per day or 2.198 TPD**

Excavation and Loading: Run-off-mine iron ore will be excavated & loaded in the 40T dumpers by 4.3m^3 capacity excavators. The detailed calculation is as follows:

❖ Excavation parameters

Bucket Capacity	= 4.3 m^3
Bucket fill factor	= 0.9
Swelling volume	= 40%
Swell factor	= 100/(100+40) = 0.71
Excavator cycle time at 90^0 swing	= 35 sec.
Seconds in an hour	= 3600
No. of working hour in a shift	8
No. of shift to be worked in a day	3
No, of working days in a year	300
Availability	= 70%
Operating efficiency	= 60%
Volume can be handled / excavator/annum	= 4.3 x 0.9 x 0.71 x 3600 x 8 x 3 x 300 x 70% x 70% / (40x1) = 872449cum
Quantity to be handled/annum	= 6593559 T or 2197853 cum
Quantity to be handled / day	21979 TPD
Quantity to be handled/ Hr	1221 TPH
No. of excavator proposed	=2197853/ 872449 =2.52 say 3 nos. Standby : 2Nos Total : 5Nos

HAULAGE & TRANSPORT EQUIPMENT FOR ORE, WASTE & MINERAL REJECTS:

Waste will be dumped and R.O.M ore will be transported to the crushing / screening / manual processing site for sizing. However, shovel dumper matching calculation has been made as follows:

- **Dumper / Tipper Parameters**

Parameters	**Iron Ore Zone**
Truck Capacity	40 T
Average bucket capacity	3 m^3
Bucket fill factor	0.9
Swell factor	0.71
Tonnage factor	3 T/m^3
Tonnes per pass	4.3 x 0.9 x 0.71 x 3 = 8.2431 T
No. of passes	Tonnage rating of tipper/tons per pass = 40/ 8.2431 = 4.85, say 5 passes

- **Dumper / Tippers requirement**

Loading time	5 x 35= 175 sec.
Lead	2 km
Load travel time	(3600 x 2)/10= 720 sec.
Dumping time	60 sec.
Empty travel time	(3600 x 2)/15= 480 sec.
Spotting time	60sec.
Dumper cycle time	175+720+60+480+60 = 1495 sec
Number of rear dump trucks required /shovel	=Cycle time/(loading + spotting time) = 1495/ (175+60)= 1535/ 235 = 6.36 say 6.0
Number of excavators	3
Number of Dumpers required in all total	3 x 6 = 18

1.0 AIR QUALITY MODELING:

Air quality modeling and Ground level concentration predication is done for mining and allied activities within the lease area including ore transportation from mineral stack and also due to mineral transportation outside the lease area. Its details are given below:

1.1 . WITHIN THE MINE LEASE AREA:

1.1.1 PRODUCTION PARTICULARS:

For modeling prediction to know the GLC at worst scenario, maximum production is considered. Maximum Iron & Manganese ore production & developments are considered. Its details are given below:

S.no	Particulars (MTPA)	Existing	After expansion	Additional Iron ore & existing Mn ore
1	**Iron:**			
	ROM Ore & waste Removal	**3.644**	**7.052**	**3.409**
2	**Manganese:**			
	ROM Ore & waste Removal		**0.288***	**0.288**
			Total	**3.697**

* Since the production from the manganese pit during baseline monitoring period was less, for modeling entire ore & waste removal is considered under additional production to know the worst scenario.

1.1.2 ADDITIONAL DAILY PRODUCTION PARTICULARS:

Sl.no	Particulars of activity	Iron (Additional) (A)	Manganese (existing) (B)	Total(A+B)
A	Material excavated in TPA (300 days/year)	**3408546**	**287990**	**3696536**
B	No of days in a year	300	300	300
C	Material excavated in TPD **(A/B)**	11361	960	12321
D	Operating hours per day	18	18	18
E	Add. Material excavated in TPH **(C/D)**	631.1	53.3	684.4

1.1.3 EMISSION SOURCES:

Pollution source type from the activities of Narayanposhi Iron & Manganese Ore Mines along with crushing & screening plant and beneficiation plant operation are as follows:

ACTIVITY	SOURCE TYPE
A. Drilling	Point
B. Excavation of ore & Waste	Open pit
C. ROM Ore & Waste transportation	Line
D. Crushing & Screening	Area
E. Beneficiation Plant	Area
F. Ore Transportation from stack yard	Line

Quantification of particulate emissions has been carried out by the emission factor technique. Emission factor is a statistical average of the rate at which a pollutant is released during an activity. This factor when multiplied by the level of that activity in a given situation will give the overall effect. Fugitive emissions (PM_{10} & $PM_{2.5}$) have been predicted by using standard equations given in **"Indian Mine and Engineering Journal" and Compilation of Air Pollutant Emission Factors, EPA Publication No. AP-42 – Guidance on Emission factors on mining industry**.

Activity	**Equation**
A. Drilling	0.6kg/hole
B. Excavation of Waste & Ore	23.6 kg/hr particulate matter for every 1000 Tonnes per hour material handling
C. Ore & Waste transportation	0.2 kg/vehicle/km.
D. Crushing & Screening Plant	
• Primary crushing & associated works	0.009 lb/ton
• Screening & associated works	0.0087 lb/ton
E. Beneficiation Plant	
• Unloading & associated works	0.004 lb/ton
F. Ore transportation from stack yard	0.2 kg/vehicle/km.

Based on the above formula, emission for various activities are estimated and given below:

A. Drilling:

Particulars of activity	**Iron (Additional) (A)**	**Manganese (existing) (B)**	**Total (A+B)**
Maximum no of holes required per day	60	66	126
Dust emission due to drilling	**36 kg/day or 2.0 kg/hr or 0.55 g/sec**	**39.6 kg/day or 2.2 kg/hr or 0.61 g/sec**	**75.6 kg/day or 4.2 kg/hr or 1.16 g/sec**

B. Excavation of Waste & Ore:

Core zone: Additional Dust emission due to excavation after expansion

Dust emission (DE): Pa x 23.6 / Wd x Wh x 1000

Pa = Annual Excavation in Tonnes

Wd = No. of days of operation in a year

Wh = Effective working hrs in a day

Particulars of activity	Iron (Additional) (A)	Manganese (existing) (B)	Total(A+B)
Material excavated in TPA (300 days/year)	**3408546**	**287990.02**	**3696536.02**
Material excavated in TPD	11361	960	14468
Material excavated in TPH (18 hr/day)	631.1	53.3	684.4
Dust emission kg/hr due to excavation	**14.9 kg/hr or say 4.14 g/sec**	**1.26 kg/hr or say 0.35 g/sec**	**16.15 kg/hr or say 4.49 g/sec**

C. Ore & Waste transportation:

Dust emission from the transport vehicles plying for the movement of ore & waste are estimated using the empirical value of 0.2 kg/vehicle/km.

DT = Tv x 0.2 x d

DT = Dust emission in kg/hr

Tv = No. of transport vehicles plying in one hour

Particulars of activity	Iron (Additional) (A)	Manganese (existing) (B)	Total (A+B)
Material excavated in TPH	631.1	53.3	684.4
Dumper/Tipper (Ore & Waste) in T	40	10	50
Avg Lead distance in the mine	2.0 km	0.5 km	-
Maximum no of Trips per hour	16 Trips/hr	5 Trips/hr	21 Trips/hr
Dust emission due to transport	**6.4 kg/hr or 1.78 g/sec**	**0.5 kg/hr or 0.14 g/sec**	**6.9 kg/hr or 1.92 g/sec**

D. Crushing plant : 0.32 g/sec

Screening plant : 0.31 g/sec

Calculation based on : Primary crushing & associated works 0.009 lb/ton

Screening & associated works 0.0087 lb/ton

E. Beneficiation Plant : 0.19 g/sec

Calculation based on: Unloading & associated works 0.004 lb/ton

F. Additional Ore transportation from stack yard:

Sl.no	Particulars of activity	Iron ore (Additional) (A)
A	Additional Material to be transported in TPA	3000000
B	No of days in a year	300
C	Add. Daily Material to be transported in TPD **(A/B)**	10000
D	Transport hours per day	20
E	Add. hourly Material to be transported in TPH **(C/D)**	500
F	Truck capacity in **T**	20
G	**Additional no of truck Trips per hour**	**25 Trips/hr**
H	**Average lead**	**1.5**
I	**Dust emission due to transport**	**7.5 kg/hr or 2.08g/sec**

SO_2 emission is calculated based on the hourly fuel consumption of each equipment and the quality of the fuel as provided by the fuel supplier.

NO_x emission is calculated based on the Engine power and the corresponding NO_X emission standard for heavy duty diesel engines as provided by the manufacturer.

CO emission is calculated based on the Engine power and the corresponding CO emission standard for heavy duty diesel engines as provided by the manufacturer.

1.1.4 Source wise Emission rate :

Based on the above, the expected emission rate due to various operations in this project without control measures & with control measures area calculated. Without control measures represents the worst scenario in which the SO2, NOX & CO are calculated for the maximum sulphur permissible limit in fuel, maximum engine power, continuous working of all the equipments including standby etc. However, in actual operations, due to reduced sulphur content of the fuel supplied, normal working conditions and its corresponding engine power, intermittent / reduced equipment operations and proper maintenance of equipments, the emission rate are expected to be less.

WITHOUT CONTROL MEASURES:

EMISSION RATE IN g/sec					
ACTIVITIES/POLLUTANTS	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**NO_X**	**CO**
Drilling	1.167	0.548	0.001	0.373	0.112
Excavation	4.488	2.109	0.004	1.467	0.440
Transportation	1.920	0.894	0.004	5.050	1.515
Crushing & Screening	0.630	0.300	0.003	0.727	0.218
Beneficiation Plant	0.190	0.090	-	-	-
Ore transport from stack	2.080	0.957	0.003	3.788	1.136
Total	**10.475**	**4.898**	**0.015**	**11.405**	**3.421**

WITH CONTROL MEASURES:

EMISSION RATE IN g/sec					
ACTIVITIES/POLLUTANTS	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**NO_X**	**CO**
Drilling	0.292	0.131	-	-	-
Excavation	1.122	0.516	-	-	-
Transportation	0.475	0.214	-	-	-
Crushing & Screening	0.158	0.071	-	-	-
Beneficiation Plant	0.048	0.021	-	-	-
Ore transport from stack	0.520	0.239	-	-	-
Total	**2.615**	**1.192**	-	-	-

The model simulations are done for the air pollutant arising from the mining operations, namely PM_{10}, $PM_{2.5}$, SO_2, NO_X & CO. **Ground Level Concentration (GLC)** have been computed using hourly meteorological data for 2 scenarios namely without control measures & with control measures. The study details are as follows:

Prediction of impacts on air environment has been carried out using mathematical model based on a steady state Gaussian plume dispersion model designed for area sources for short term. In the present case, **ISCST (Industrial Source Complex-Short Term ISC-3) model – AERMOD view** has been used to predict the impacts.

1.1.5 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:

$$x = \frac{Q_A K}{2\pi U_s} \int_{x\sigma_y\sigma z}^{\infty} VD \int_{y\sigma_y}^{\infty} \exp\left[-0.5 \frac{y^2}{\sigma_y^2}\right] dy\, dx$$

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)
Us = mean wind speed at release height

1.1.5.1 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).

The vertical term without deposition effects is given by:

$$V = (1 + \gamma)\left[\exp\left(-\frac{He^2}{2\sigma_z^2}\right) + \sum_{i=1}^{\infty} \gamma^{n-1} \exp\left(-\frac{(2n\,Hm - He)^2}{2\sigma_z^2}\right) + \exp\left(-\frac{(2n\,Hm + He)^2}{2\sigma_z^2}\right)\right]$$

where,

H = effective release height of emissions (plume rise + physical stack height)

Hm = Mixing height

γ = 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 (γ = 1). For number of sources more than one simulation is done for each individual source and then added. In order to calculate σ_y and σ_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) **(4)**

y = (X(R) - X(S)) Cos (WD) - (Y(R) - Y(S)) Sin (WD) **(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.

1.1.6.2 DISPERSION COEFFICIENTS:

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

σ_y = 465.11628 (x) tan (TH)

where,

TH = 0.017453293 [c-d ln (x)]

In the above equations down wind distance `x' is in kilometers and coefficients `c' and `d' are listed in **Table No - 1**. The equation used to calculate σ_z is of the form:

$\sigma_y = ax^b$

wheredown wind distance x is in kilometers and σ_z is in meters. The coefficients `a' and `b' are given in **Table No - 2.**

Table No- 1

COEFFICIENTS USED TO CALCULATE LATERAL VIRTUAL DISTANCES

	$\pm_y = \frac{\pm_{y0}^{l/q}}{P}$	
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

Table No- 2

PARAMETERS USED TO CALCULATE PASQUILL-GIFFORD VERTICAL DISPERSION COEFFICIENT ($\pm_z$)

$\pm_z$ (meters) = ax^b (x in km)			
Pasquill Stability Category	**x (km)**	**A**	**B**
A*	<0.10	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*	<0.20	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
E	<0.10	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	<0.20	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 σ_z exceed 5000 m, σ_z is set to 5000 m.

** σ_z is equal to 5000 m.

1.1.5.3 METEOROLOGICAL CONDITIONS USED IN PREDICTIONS:

The hourly meteorological data has been generated at the site for Winter Season (December 2017 – February 2018).and the same has been used in the predictions. The hourly wind speed, temperature, direction and stabilities have been used.

1.1.5.4 ATMOSPHERIC STABILITY

Many alternative models are developed by different authors to relate σ_y and σ_z with downwind distance under different atmospheric stability conditions. “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 inTable **No- 3** below:

Table No- 3

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

1.1.6. GLC RESULTS:

The results of the Peak GLC’s for various environmental parameters without & with control measures are given below:

S. No	Parameters	Peak incremental GL concentration µg/m^3	
		Without control	With control
1	PM_{10}	42.6	10.24
2	$PM_{2.5}$	20.6	4.69
3	SO_2	0.06	-
4	NO_X	40.2	-
5	CO	23.1	-

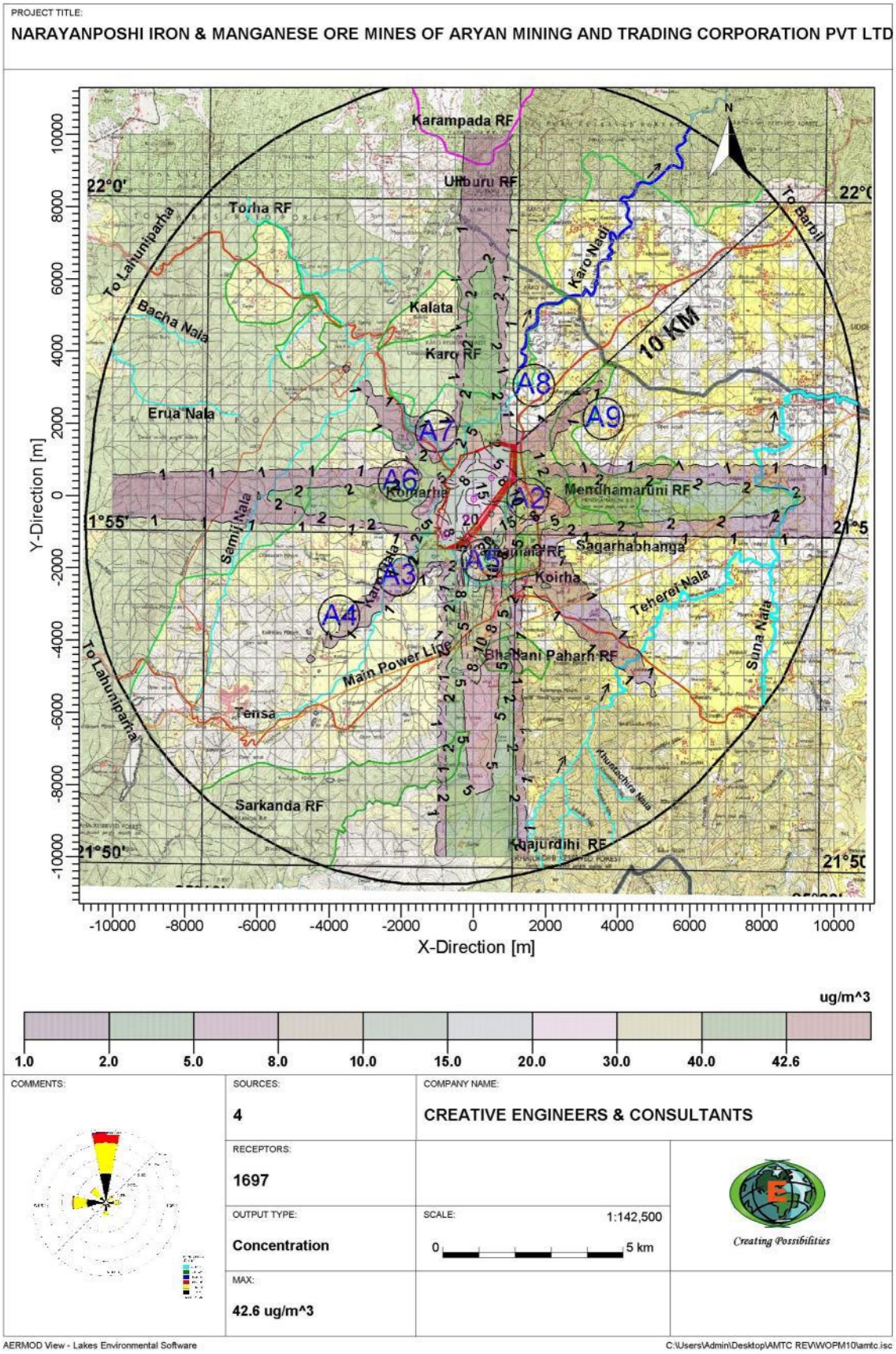
The Isopleths of PM_{10}, $PM_{2.5}$, SO_2, NO_X & CO concentrations for without & with control measures scenario have been drawn and these are given in **Figure No – 1A –to 1E and 2A- 2B**.

It is observed that the peak incremental concentration for PM_{10}, $PM_{2.5}$, SO_2, NO_X & CO is occurring very near the source only. At away places from the active source, the values are getting reduced due to wind dispersion and distance effects.

However, various mitigative measures will be strictly enforced in this project during working and the GLC values will be brought down.

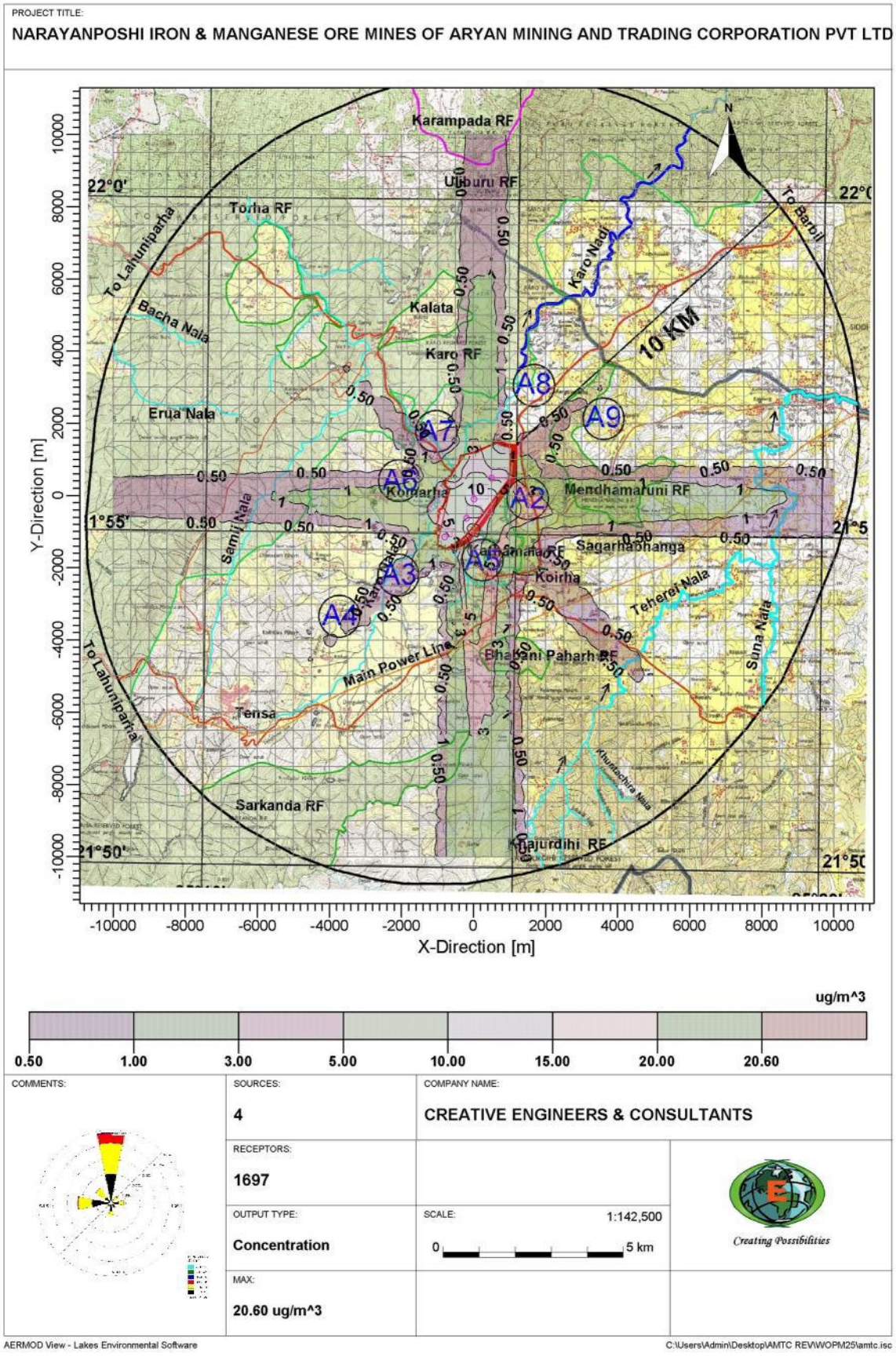
ISOPLETH OF GLC PREDICTION FOR PM_{10} WITHOUT CONTROL MEASURES

Figure No – 1A



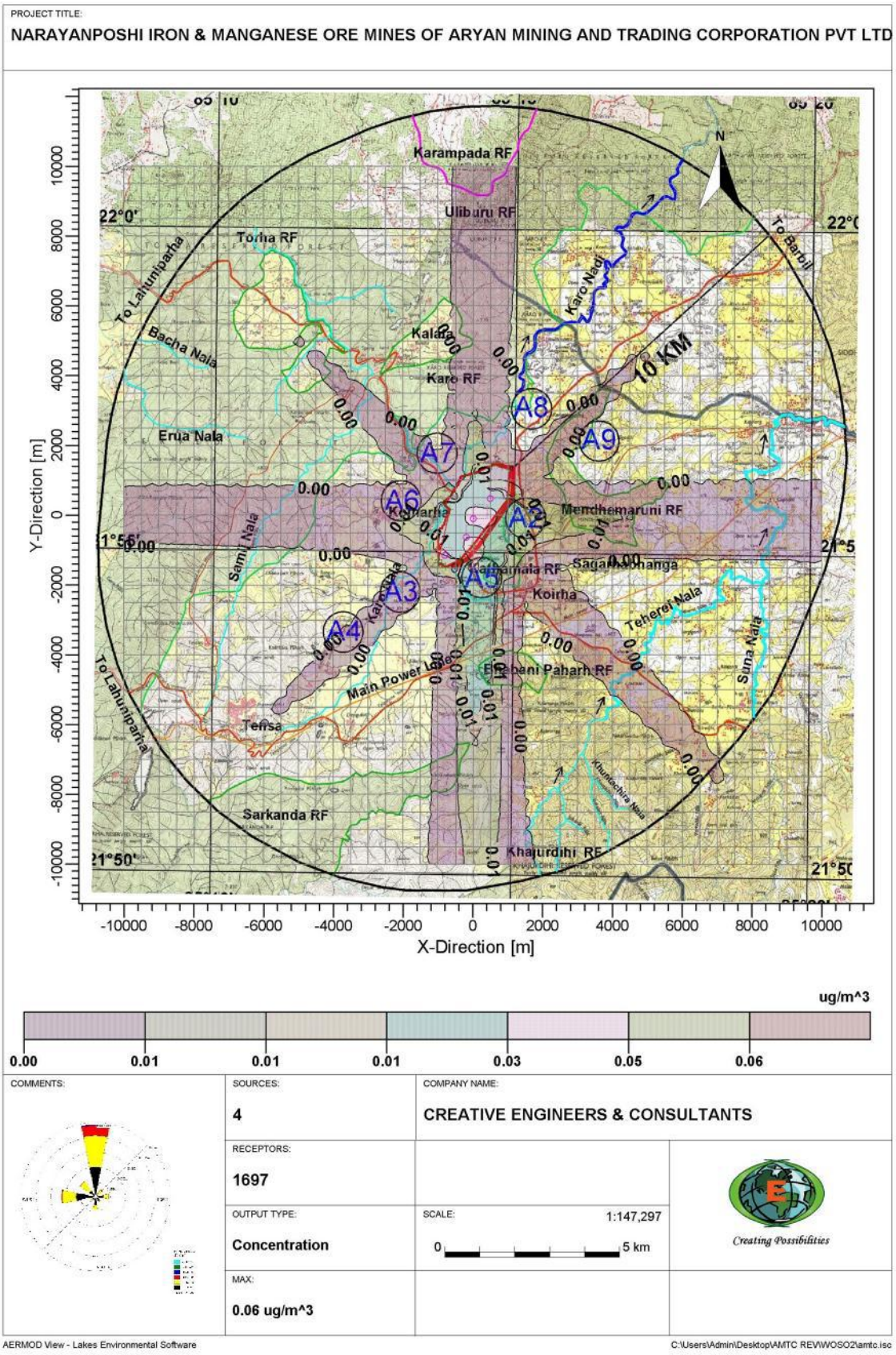
ISOPLETH OF GLC PREDICTION FOR $PM_{2.5}$ WITHOUT CONTROL MEASURES

Figure No – 1B



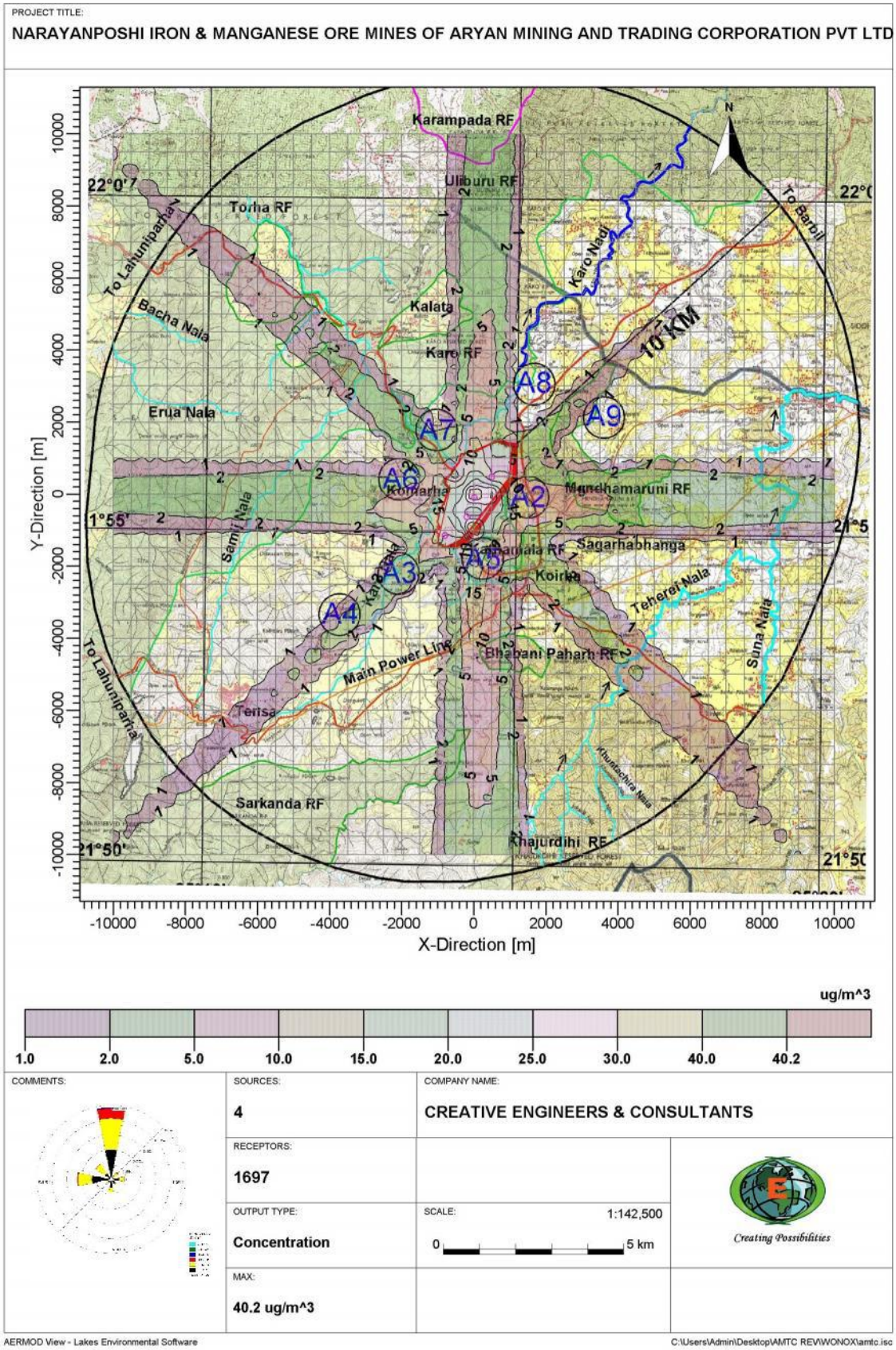
ISOPLETH OF GLC PREDICTION FOR SO_2 WITHOUT CONTROL MEASURES

Figure No – 1C

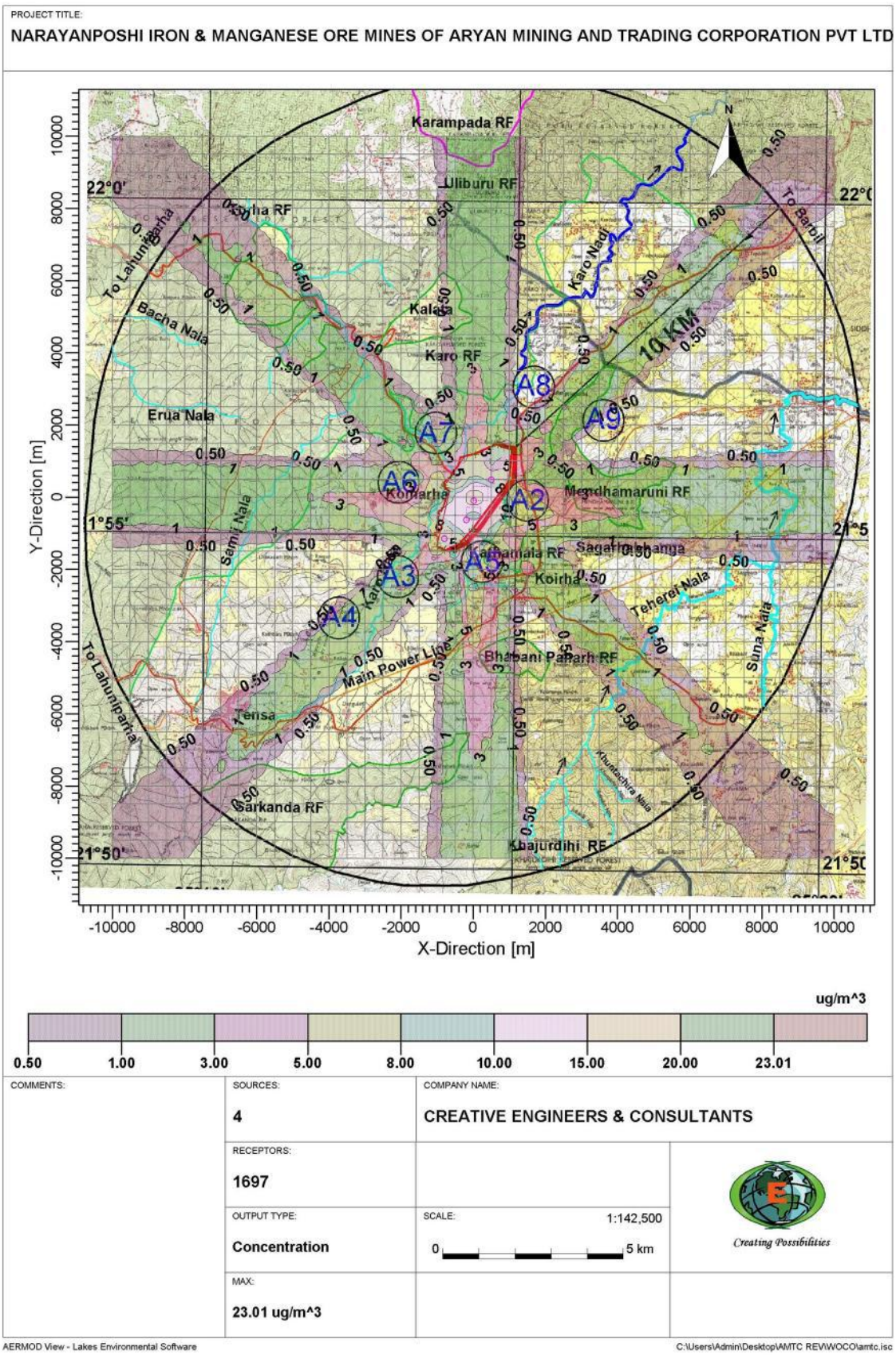


ISOPLETH OF GLC PREDICTION FOR NO_X -WITHOUT CONTROL MEASURES

Figure No – 1D

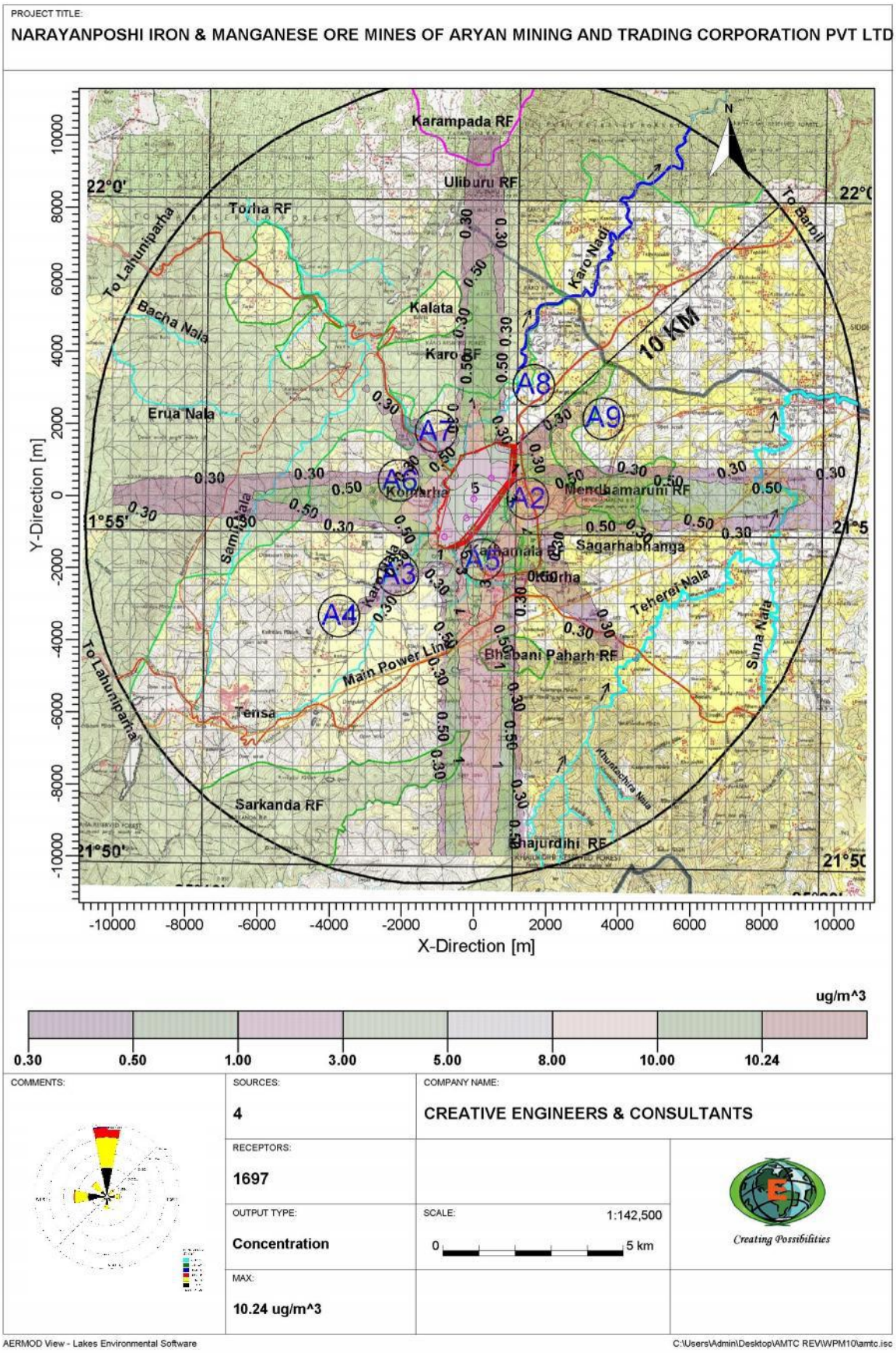


ISOPLETH OF GLC PREDICTION FOR CO -WITHOUT CONTROL MEASURES **Figure No 1 – E**



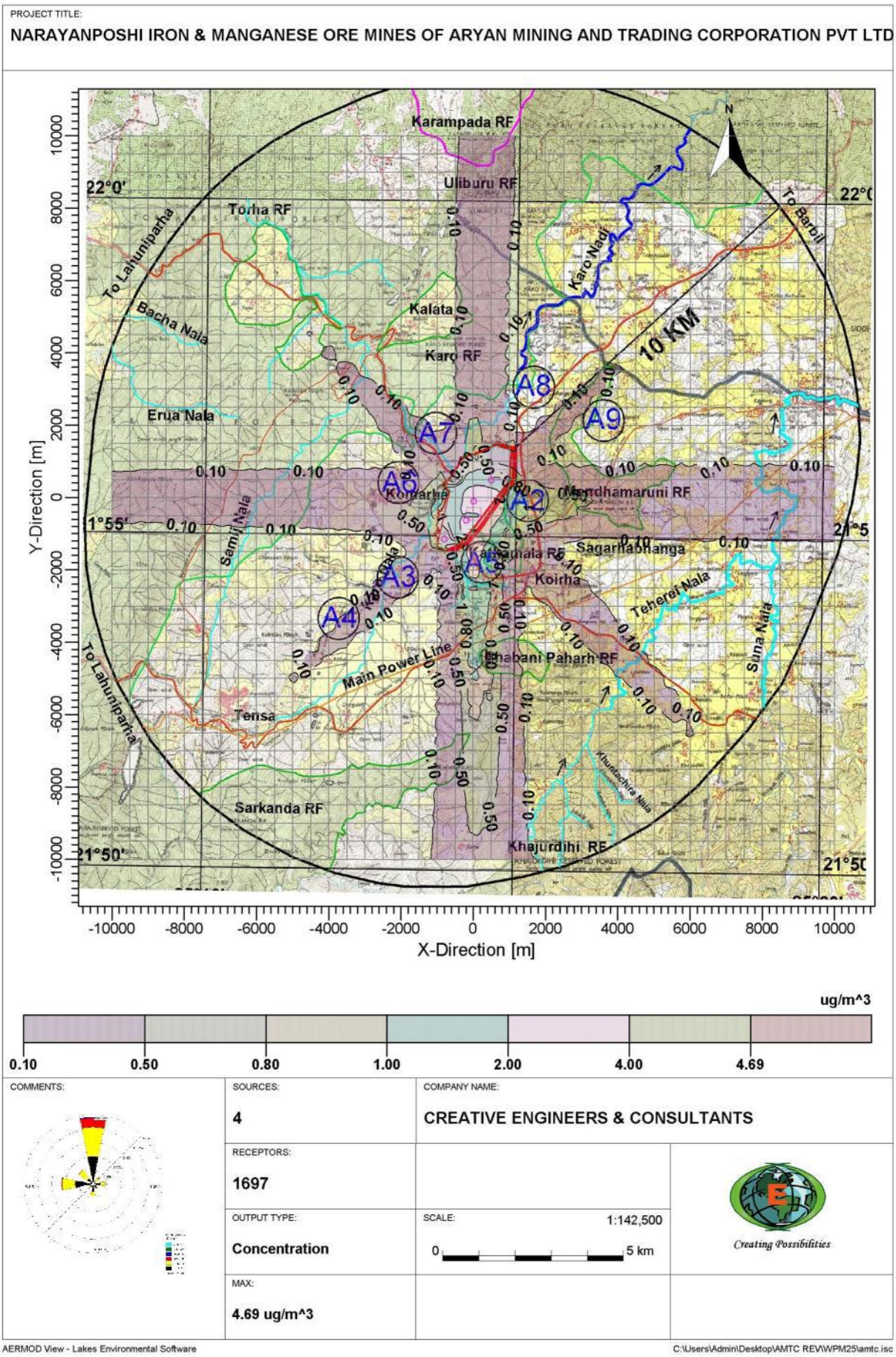
ISOPLETH OF GLC PREDICTION FOR PM_{10} - WITH CONTROL MEASURES

Figure No – 2A



ISOPLETH OF GLC PREDICTION FOR $PM_{2.5}$ - WITH CONTROL MEASURES

Figure No – 2B



1.2 OUTSIDE THE MINE LEASE AREA:

Impact on air quality due to transportation of additional ore by road outside the lease area is assessed with computer dispersion modelling and its details are given below:

Sl.no	Particulars of activity	Iron ore (Additional) (A)
A	Additional Material to be transported in TPA	3000000
B	No of days in a year	300
C	Add. Daily Material to be transported in TPD **(A/B)**	10000
D	Transport hours per day	20
E	Add. hourly Material to be transported in TPH **(C/D)**	500
F	Truck capacity in **T**	20
	Additional no of truck Trips per hour	**25 Trips/hr**

These additional 25 trucks per hour will be distributed in three different roads as given below:

- ✓ About 10 trucks per hour in the road via kalta on the north west side.
- ✓ About 8 trucks per hour in the road towards Barbil on the north eastern side.
- ✓ About 7 trucks per hour in the road via Tensa on the south west side.

EMISSION RATE:

Dust emission from the transport vehicles plying for the movement of additional truck is estimated using the empirical value of 0.2 kg/vehicle/km.

DT = Tv x 0.2 x d

DT = Dust emission in kg/hr

Tv = No. of transport vehicles plying in one hour

Emission rate in 3 different routes are as follows:

Sl.no	Route	Additional trucks per hour	Emission considering both sides		
			in Kg/hr per km	Without (In grams /sec per km)	With (In grams /sec per km)
1	**In the road via Kalta**	**10**	**4**	**1.12**	**0.28**
2	**In the road towards Barbil**	**8**	**3.2**	**0.88**	**0.22**
3	**in the road via Tensa**	**7**	**2.8**	**0.78**	**0.20**

ISCST (Industrial Source Complex-Short Term ISC-3) model using line source has been used to predict the impacts.

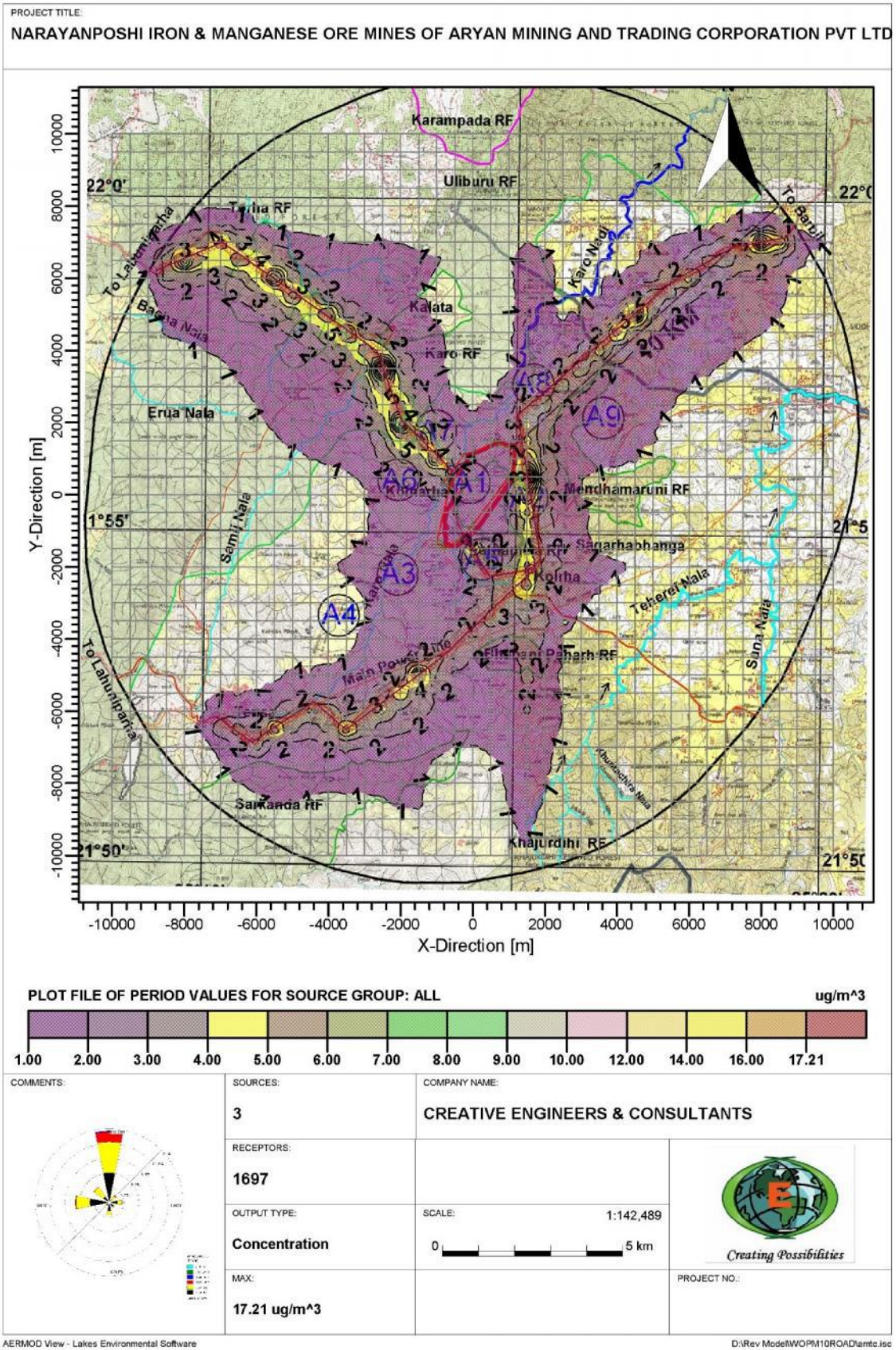
The results of the Peak GLC's for various environmental parameters due to additional mineral transportation from this lease are given below:

S. No	Parameters	Peak incremental concentration µg/m^3	
		Without control	With control
1	PM_{10}	17.21	4.31
2	$PM_{2.5}$	8.02	1.96
3	SO_2	0.002	-
4	NO_X	3.73	-
5	CO	1.18	-

The Isopleths of PM_{10}, $PM_{2.5,}$ SO_2, NO_X & CO concentrations due to transportation of additional mineral are given in **Figure No – 3 A to 3 G.**

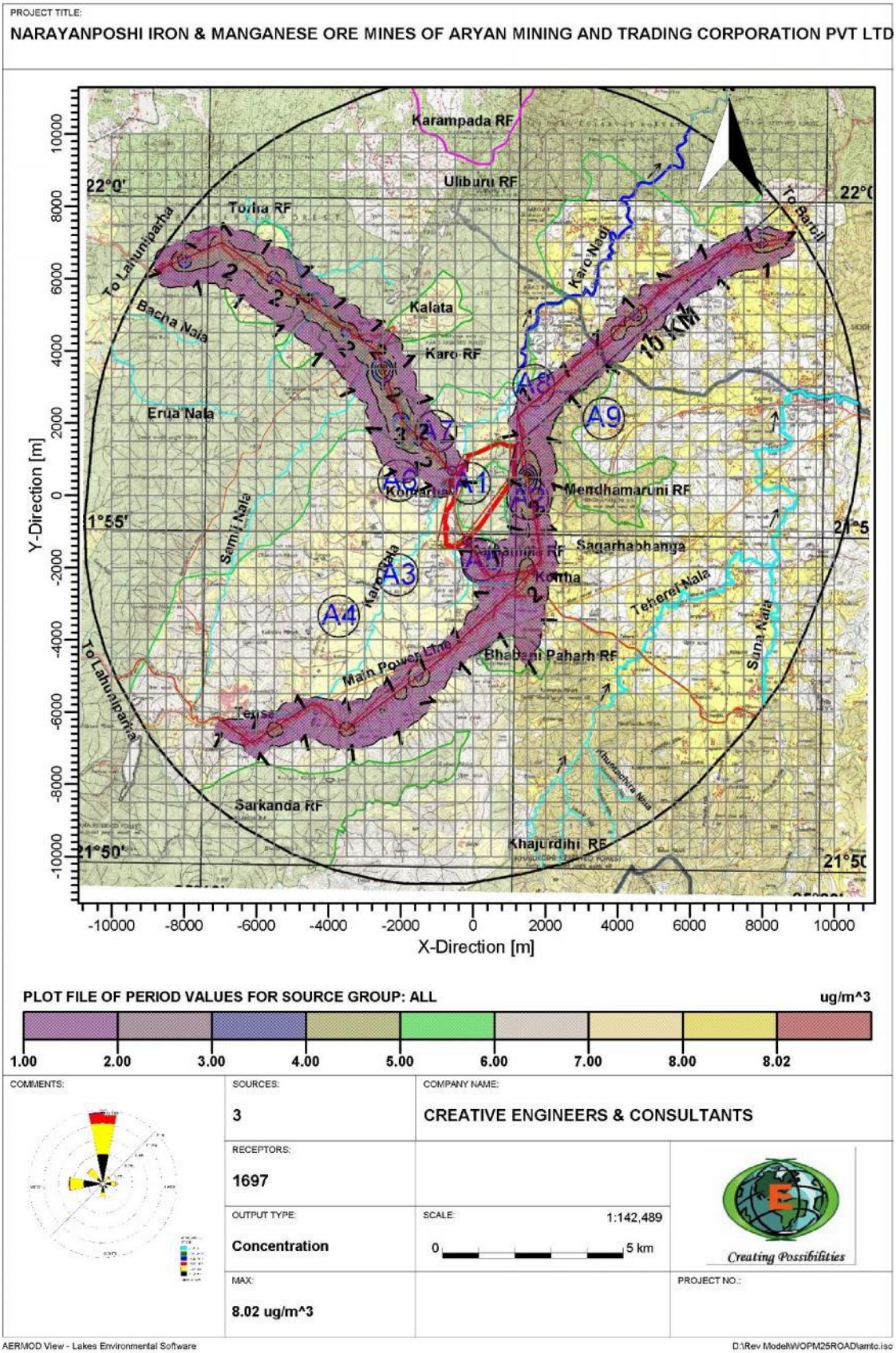
ISOPLETH OF GLC PREDICTION FOR PM_{10} - WITHOUT CONTROL MEASURES DUE TO TRANSPORTATION OUTSIDE THE LEASE

Figure No – 3A



ISOPLETH OF GLC PREDICTION FOR $PM_{2.5}$ WITHOUT CONTROL MEASURES DUE TO TRANSPORTATION OUTSIDE THE LEASE

Figure No – 3B



ISOPLETH OF GLC PREDICTION FOR SO_2 WITHOUT CONTROL MEASURES DUE TO TRANSPORTATION OUTSIDE THE LEASE

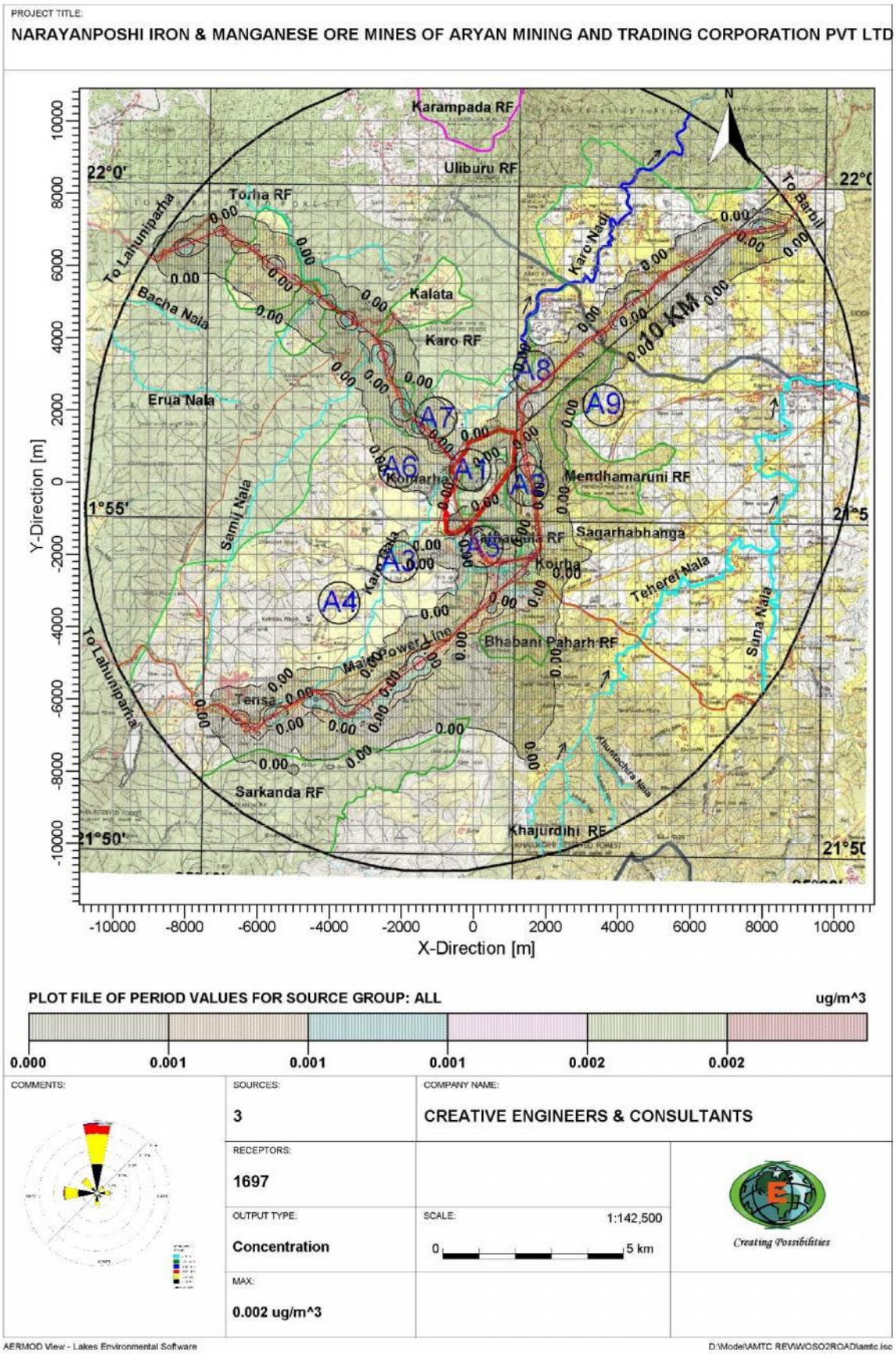
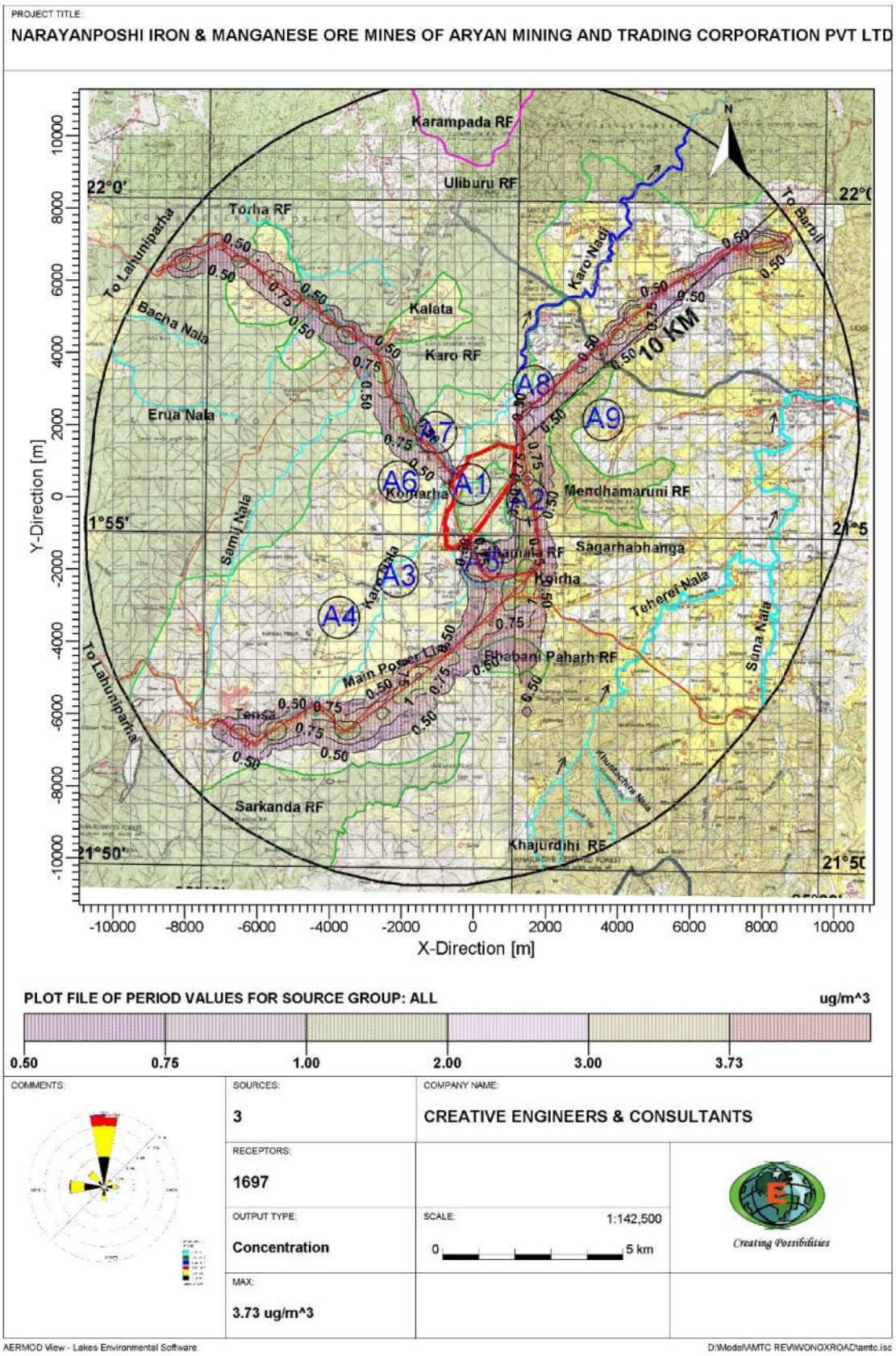
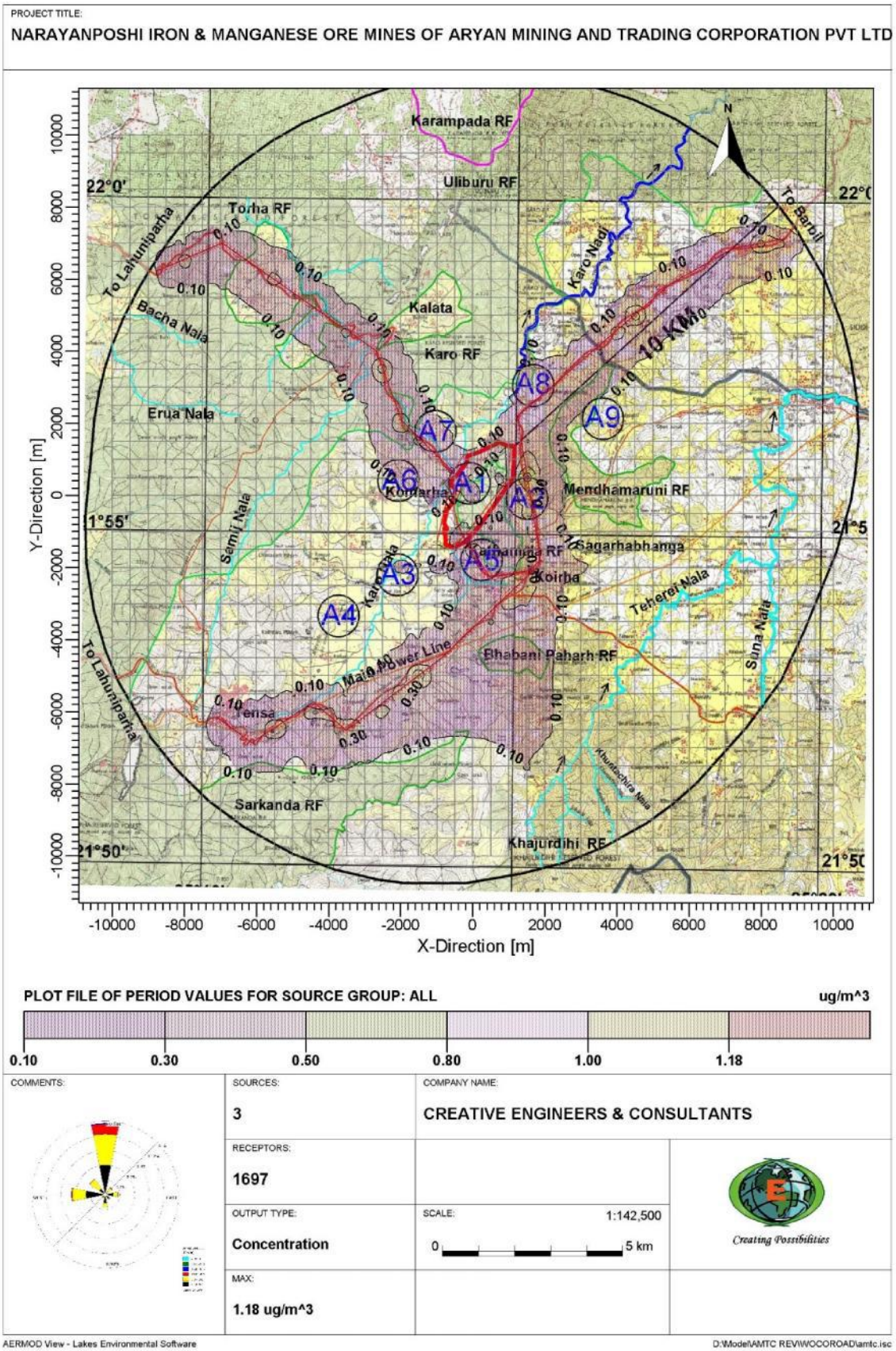


Figure No – 3D

ISOPLETH OF GLC PREDICTION FOR NO_X WITHOUT CONTROL MEASURES DUE TO TRANSPORTATION OUTSIDE THE LEASE



ISOPLETH OF GLC PREDICTION FOR CO WITHOUT CONTROL MEASURES DUE TO TRANSPORTATION OUTSIDE THE LEASE



ISOPLETH OF GLC PREDICTION FOR PM_{10} - WITH CONTROL MEASURES DUE TO TRANSPORTATION OUTSIDE THE LEASE

Figure No – 3F

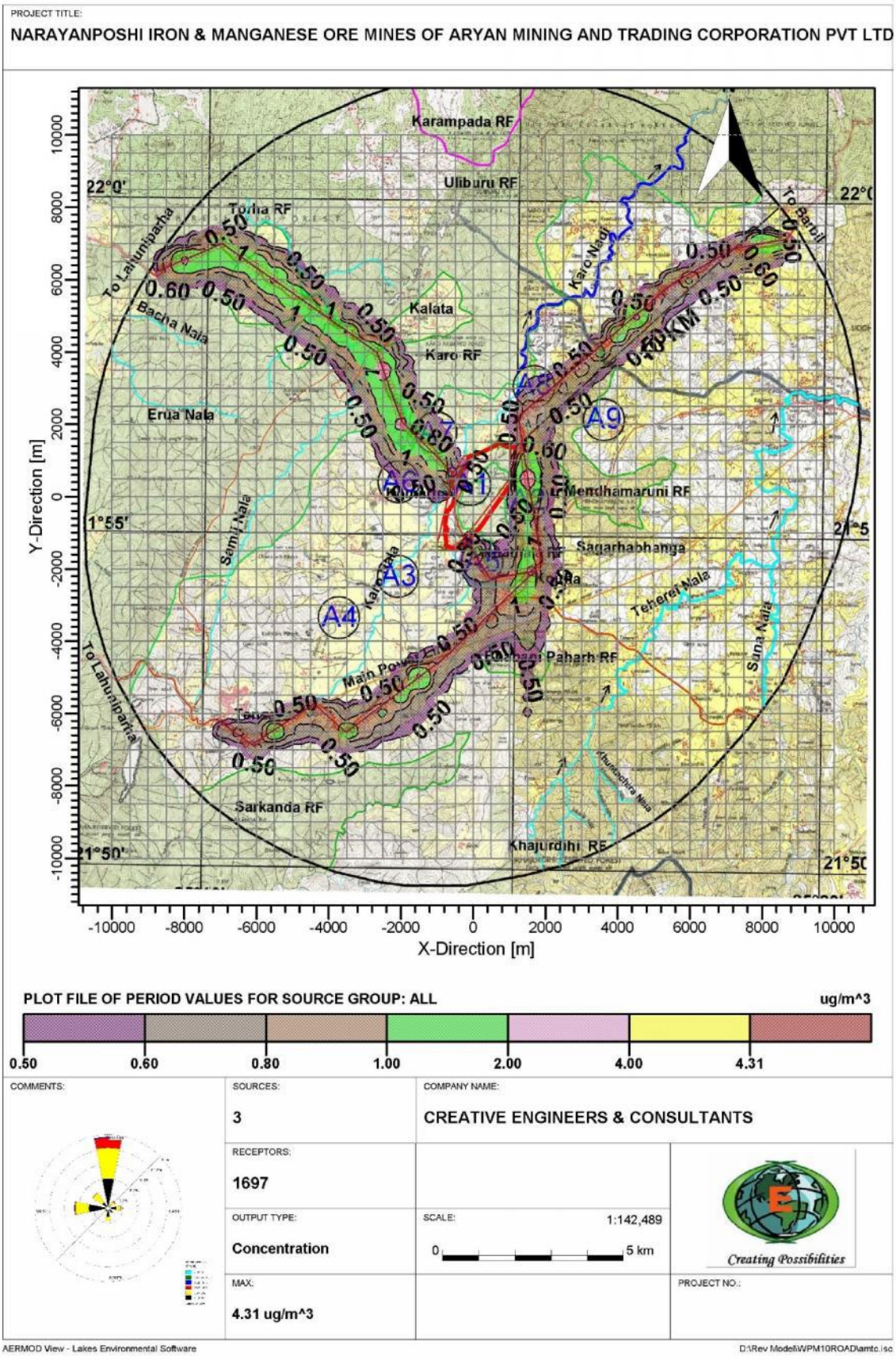
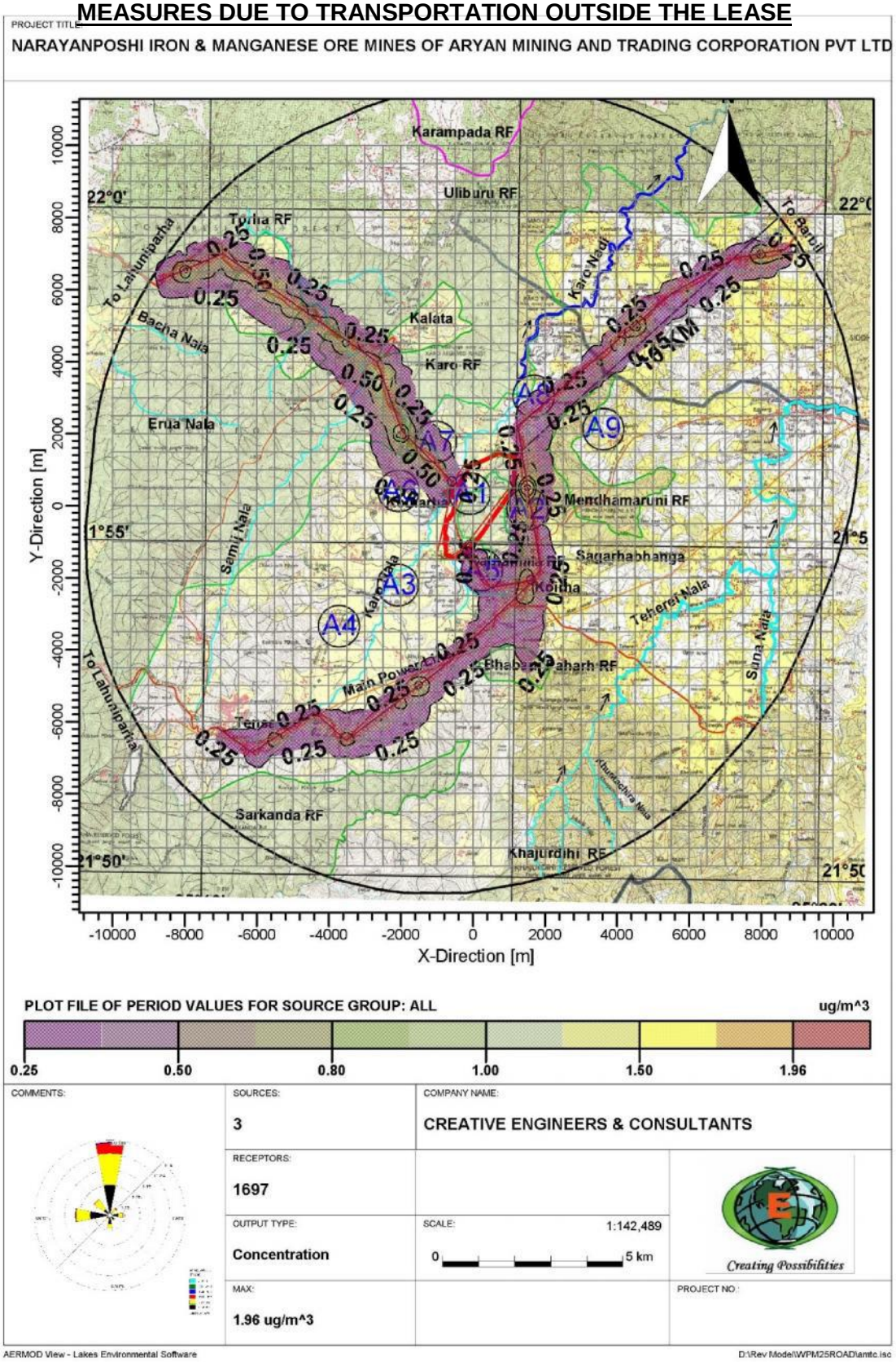


Figure No – 3G

ISOPLETH OF GLC PREDICTION FOR $PM_{2.5}$ - WITH CONTROL MEASURES DUE TO TRANSPORTATION OUTSIDE THE LEASE



1.3 PREDICTED AMBIENT AIR QUALITY:

The post project Concentrations of PM_{10}, $PM_{2.5}$, SO_2, NO_X & CO (GLC) (base line + incremental) due to additional mine production after adopting necessary control measures in the mines is given in **Table No – 1 to 5.**

Table No - 1

CONCENTRATIONS OF PM_{10} AFTER PROJECT IMPLEMENTATION

S. No	Location	Background concentration of PM_{10} («g/m^3)	Predicted incremental concentration of PM_{10} («g/m^3)		Post project concentration («g/m^3)	CPCB limits («g/m^3)
			Due to additional mine production	Due to additional mineral transportation		
1	A1-Mine lease area	71.2	7.0	1.0	79.2	**100**
2	A2-Kashira	76.7	4.0	2.0	82.7	
3	A3-Nuagaon	63.9	<0.5	<0.5	64.9	
4	A4- Bandal	68.2	<0.5	<0.5	69.2	
5	A5-Koira	84.7	5.0	1.5	91.2	
6	A6-Komando	78.5	<0.5	1.0	80.0	
7	A7-Kusumdihi	81.5	<0.5	1.0	83.0	
8	A8-Sagasahi	61.5	<0.5	1.0	63.0	
9	A9-Rengalbeda	78.4	<0.5	<0.5	79.4	

Table No - 2

CONCENTRATIONS OF $PM_{2.5}$ AFTER PROJECT IMPLEMENTATION

S. No	Location	Background concentration of $PM_{2.5}$ («g/m^3)	Predicted incremental concentration of $PM_{2.5}$ («g/m^3)		Post project concentration («g/m^3)	CPCB limits («g/m^3)
			Due to additional mine production	Due to additional mineral transportation		
1	A1-Mine lease area	36.4	3.0	1.0	40.4	60
2	A2-Kashira	34.9	2.0	1.5	38.4	
3	A3-Nuagaon	32.7	<0.5	<0.5	33.7	
4	A4- Bandal	36.4	<0.5	<0.5	37.4	
5	A5-Koira	45.7	2.5	1.0	49.2	
6	A6-Komando	41.2	<0.5	<0.5	42.2	
7	A7-Kusumdihi	41.4	<0.5	<0.5	42.4	
8	A8-Sagasahi	27.7	<0.5	<0.5	28.7	
9	A9-Rengalbeda	37.3	<0.5	<0.5	38.3	

Table No - 3

CONCENTRATIONS OF SO_2 AFTER PROJECT IMPLEMENTATION

S. No	Location	Background concentration of SO_2 («g/m^3)	Predicted incremental concentration of SO_2 («g/m^3)		Post project concentration («g/m^3)	CPCB limits («g/m^3)
			Due to additional mine production	Due to additional mineral transportation		
1	A1-Mine lease area	5.1	<0.5	<0.5	6.1	**80**
2	A2-Kashira	6.2	<0.5	<0.5	7.2	
3	A3-Nuagaon	4.4	<0.5	<0.5	5.4	
4	A4- Bandal	4.9	<0.5	<0.5	5.9	
5	A5-Koira	7.6	<0.5	<0.5	8.6	
6	A6-Komando	6.8	<0.5	<0.5	7.8	
7	A7-Kusumdihi	7.1	<0.5	<0.5	8.1	
8	A8-Sagasahi	4.8	<0.5	<0.5	5.8	
9	A9-Rengalbeda	5.6	<0.5	<0.5	6.6	

Table No - 4

CONCENTRATIONS OF NOx AFTER PROJECT IMPLEMENTATION

S. No	Location	Background concentration of NO_X («g/m^3)	Predicted incremental concentration of NO_X («g/m^3)		Post project concentration («g/m^3)	CPCB limits («g/m^3)
			Due to additional mine production	Due to additional mineral transportation		
1	A1-Mine lease area	12.8	12.0	<0.5	25.3	**80**
2	A2-Kashira	13.5	8.0	1.5	23.0	
3	A3-Nuagaon	11.9	2.0	<0.5	14.4	
4	A4- Bandal	11.5	1.0	<0.5	13.0	
5	A5-Koira	18.6	10.0	1.0	29.6	
6	A6-Komando	14.1	1.5	<0.5	16.1	
7	A7-Kusumdihi	15.2	1.5	<0.5	17.2	
8	A8-Sagasahi	9.6	<0.5	<0.5	10.6	
9	A9-Rengalbeda	13.2	<0.5	<0.5	14.2	

Table No - 5

CONCENTRATIONS OF CO AFTER PROJECT IMPLEMENTATION

S. No	Location	Background concentration of CO («g/m^3)	Predicted incremental concentration of CO («g/m^3)		Post project concentration («g/m^3)	CPCB Limits («g/m^3)
			Due to additional mine production	Due to additional mineral transportation		
1	A1-Mine lease area	<1144	7.0	<0.5	<1151.5	**4000**
2	A2-Kashira	<1144	4.5	<0.5	<1149.0	
3	A3-Nuagaon	<1144	1.5	<0.5	<1146.0	
4	A4- Bandal	<1144	1.0	<0.5	<1145.5	
5	A5-Koira	<1144	5.0	<0.5	<1149.5	
6	A6-Komando	<1144	2.0	<0.5	<1146.5	
7	A7-Kusumdihi	<1144	1.0	<0.5	<1145.5	
8	A8-Sagasahi	<1144	<0.5	<0.5	<1145.0	
9	A9-Rengalbeda	<1144	<0.5	<0.5	<1145.0	

From the model it could be seen that the predicted maximum incremental GLC after expansion, for PM10 within the lease area (A1) is expected to be 8 µg/m3, in the nearby AAQ monitoring locations namely Kashira village(A2) & Koira village (A5) are 6 µg/m3 & 6.5 µg/m3 respectively whereas at away places from the active source, the values are getting reduced due to wind dispersion and distance effects.

From the study it can be seen that the resultant cumulative concentrations due to additional mining and mineral transportation due to expansion with baseline figures after adopting necessary mitigative measures are within the prescribed NAAQ limits.

For preservation of environment in this mine strict enforcement of management schemes and regular air quality monitoring will be undertaken for taking corrective actions, as needed. **By adopting the effective implementation of all the mitigative measures no adverse impact on Ambient Air quality due to the mining operation in this lease area is expected.**

* * * * * * * *

Annexure - 3

Tentative Project Schedule for 2 MTPA Iron Ore Beneficiation Plant Installation for Nayayanposhi Iron and Mn Mines of Aryan Mining and Trading Corporation Pvt. Ltd.

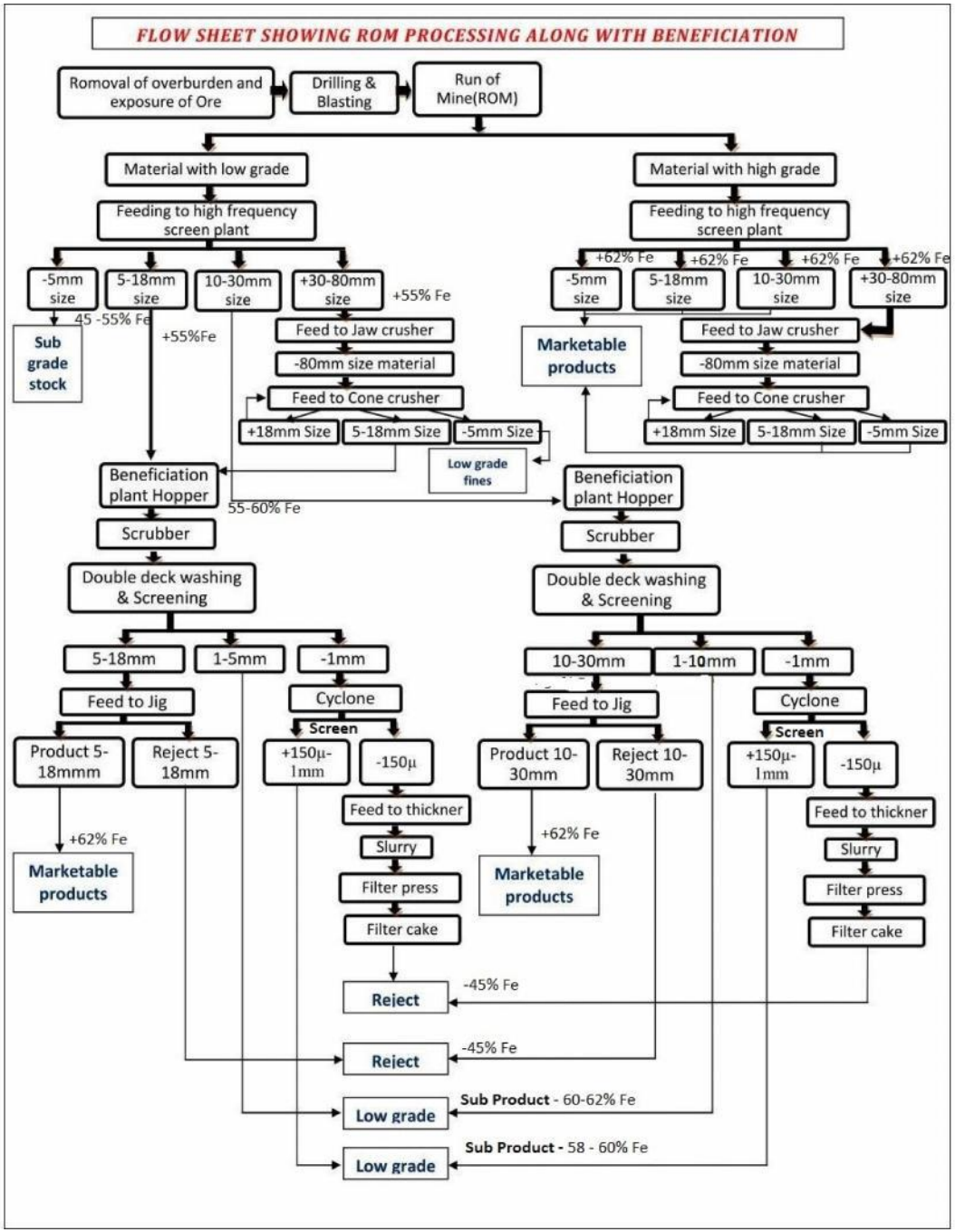
Sl.NO	Activity	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14
A	**Total Project Schedule**														
1	**Civil Works**														
1. 1	**Civil Works for feed hopper building**														
a	Earth Excavation														
b	PCC & RCC														
c	Backfilling & Finishing works														
1.2	**Civil Works for Scrubber building**														
a	Earth Excavation														
b	PCC & RCC														
c	Backfilling & Finishing works														
1.3	**Civil Works for Jig Building**														
a	Earth Excavation														
b	PCC & RCC														
c	Backfilling & Finishing works														
1.4	**Civil Works for Filter Press building & Thickeners**														
a	Earth Excavation														
b	PCC & RCC														
c	Backfilling & Finishing works														
1.5	**Civil works for transformer & Other miscellenous**														
2	**Dismantling Work at Source**														
a	Dismantling, loading & dispatch of Scrubber and its associate equipments														
b	Dismantling, loading & dispatch of Screens and its associate equipments														
c	Dismantling, loading & dispatch of Hopper & scrubber building structures														
d	Dismantling, loading & dispatchof Jigs and its associated equipments														
e	Dismantling, loading & dispatch of Jig building structures														
f	Dismantling, loading & dispatch of Thickener & Filter Press														
g	Dismantling, loading & dispatch of Filter press buildings														
h	Dismantling, Loading & dispatch of transformer slurry pipeline, Conveyors & Utilities etc.														
3	**Erection of structural & Machineries**														
a	Erection of Hopper & Scrubber building structures														
b	Erection of Scrubber, Screens and its associated equipments														
c	Erection of Jig building structures														
d	Erection of Jig and its associated equipments														
e	Erection of Filter Press building structures														
f	Erection of Thickener & Press filter equipments														
g	Erection of Slurry Pipelines, Conveyors,& utilities etc.														
h	Installation of transformer & Other electrics														
Ready for Commissioning															

For Allmineral Asia

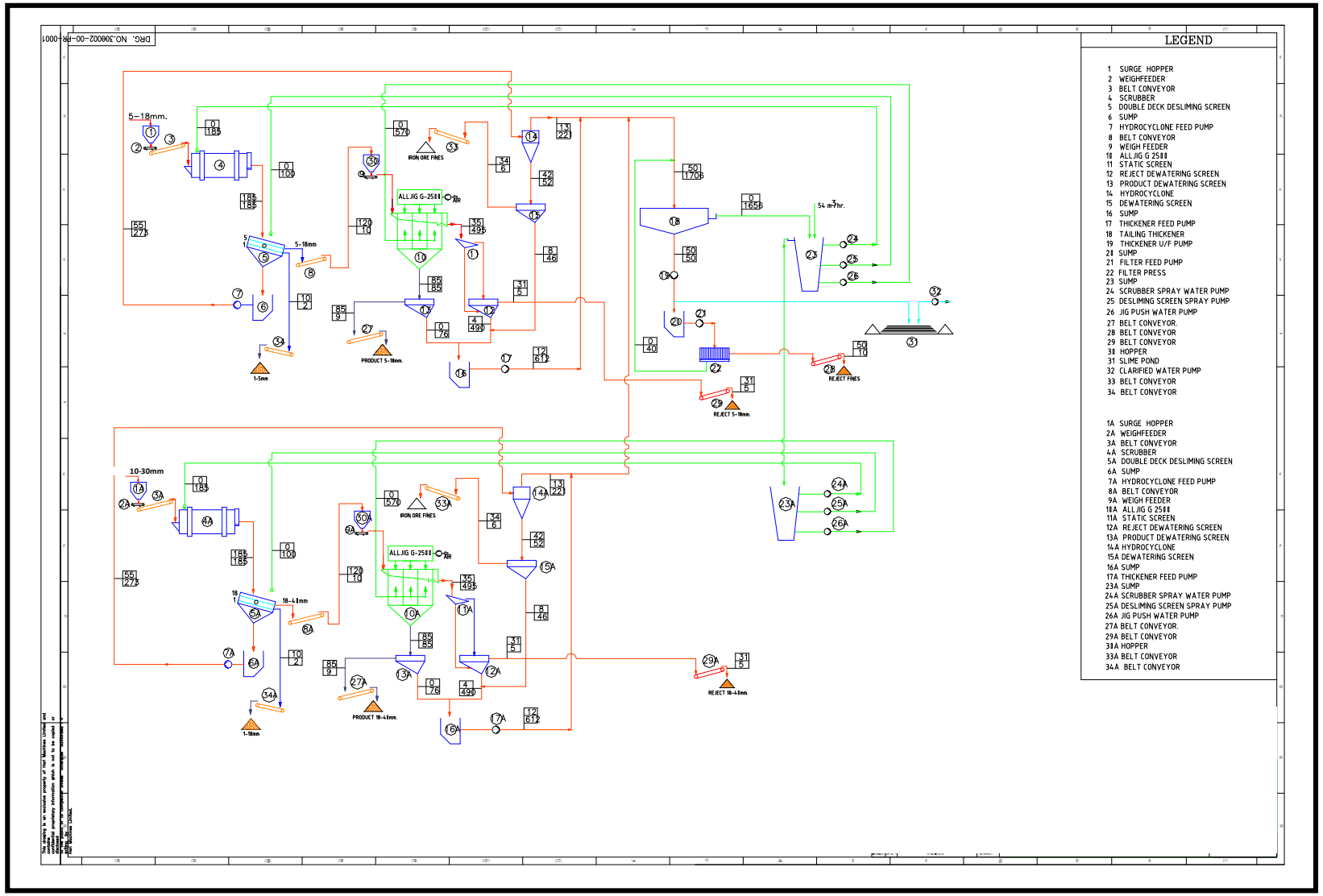
Rajkumar - Process Engineer

Note:
Engineering, Survey & Soil test investigation etc. activities will be completed in advance.

Annexure - 4


FLOW SHEET SHOWING ROM PROCESSING ALONG WITH BENEFICIATION
Romoval of overburden and exposure of Ore
Drilling & Blasting
Run of Mine(ROM)
Material with low grade
Material with high grade
Feeding to high frequency screen plant
Feeding to high frequency screen plant
-5mm size
5-18mm size
10-30mm size
+30-80mm size
+55% Fe
45 -55% Fe
+55%Fe
Sub grade stock
Feed to Jaw crusher
-80mm size material
Feed to Cone crusher
+18mm Size
5-18mm Size
-5mm Size
Low grade fines
+62% Fe
+62% Fe
+62% Fe
+62% Fe
-5mm size
5-18mm size
10-30mm size
+30-80mm size
Marketable products
Feed to Jaw crusher
-80mm size material
Feed to Cone crusher
+18mm Size
5-18mm Size
-5mm Size
Beneficiation plant Hopper
55-60% Fe
Beneficiation plant Hopper
Scrubber
Scrubber
Double deck washing & Screening
Double deck washing & Screening
5-18mm
1-5mm
-1mm
10-30mm
1-10mm
-1mm
Feed to Jig
Cyclone
Feed to Jig
Cyclone
Screen
Screen
Product 5-18mmm
Reject 5-18mm
+150µ-1mm
-150µ
Product 10-30mm
Reject 10-30mm
+150µ-1mm
-150µ
Feed to thickner
Feed to thickner
Slurry
Slurry
Filter press
Filter press
Filter cake
Filter cake
+62% Fe
Marketable products
+62% Fe
Marketable products
Reject
-45% Fe
Reject
-45% Fe
Low grade
Sub Product - 60-62% Fe
Low grade
Sub Product - 58 - 60% Fe

FLOW SHEET FOR 2x185 TPH IRON ORE BENEFICIATION PLANT WITH MASS & WATER BALANCE



❖ **Over-all this proposed process is totally closed circuit with zero effluent discharge, nearly 95-97% water can be recovered from the circuit. Resultant, make up of fresh water to the tune of 54 m3/hr will be added.**

Annexure -5

DETAILS OF COURT CASES OF NARAYANPOSHI IRON & MN MINES,
M/s. ARYAN MINING & TRADING CORP. PVT. LTD.

1. **EP ACT CASE:**
    a. EP Case filed before the court of SDJM, Bonai by the Collector, Sundargarh vide case no. 43/2013. 5 **Annexure – 5 A**
    b. Interim stay order passed by the Hon'ble High Court of Odisha, dated 31.10.2014. **Annexure – 5 B**
    c. The matter already discussed in common cause and as per the order of the judgement made by the Hon'ble Supreme Court 02.08.2017 in the matter of W.P.(C) 114/2014, dated, DDM, Koira has raised the demand under section 21(5) of MMDR Act, 1957 on EC and FC violations and the same has been complied.
    d. It is anticipated that the case will be disposed accordingly.
    e. Besides the above details provided for past EC violation, there is no increase in production by the Lessee in the existing environmental clearance i.e. 3.0 MTPA iron ore & 0.036 MTPA Mn ore.

2. **CTO & MP COMPENSATION DEMAND:**
    a. Revision petition filed before the Ministry of Mines, Govt. of India against the notice served by DDM, Koira, Odisha vide no. 5542/Mines, dated 26.09.2017 for excess production of approved limit under Mining Plan and Consent to Operate in pursuance to judgement made by the Hon'ble Supreme Court vide case no. 114/2014, dated 02.08.2017. **Annexure – 5 C**

    b. Hearing made on 27.12.2017 and the RA directed the State Govt. not to take any cohesive action to recover the amount specified in the impugned orders. **Annexure – 5 D**

    c. Further Hearing held on 30.10.2018 & the order was reserved and finally disposed as per the order dated 26.11.2018. The Revision Authority set-aside the state govt. order and directed the State Govt. to hear the matter afresh and pass a detailed and reasoned order. **Annexure – 5 E**

Annexure - 5A

IN THE COURT OF THE SUB-DIVISIONAL JUDICIAL MAGISTRATE,
BONAI

2 (c) C. Case No. 43 / 2013

Government of India, Ministry of Environment and Forest,
Represented through the Collector, Sundargarh,
Smt.Roopa Roshan Sahoo,I.A.S being authorized by
the Central Government in S O No.394(E) and so also
vide letter No.19759/F&E,dated.21.10.2012
of Govt. of Odisha .....Complainant.

Versus

1. P.K.Saraf (Director & Nominated owner)
Narayanposi Manganese Mines of A.M & T.C (P) Limited.
At present residing at Aryan House, 8th Floor, PI-Hide Lane, Kolkata
55/1 Lake Road, Kolkata (West Bengal) .....Accused Person.

Petition under Section 15 of Environment (Protection) Act, 1986.

The complainant above named do hereby filed complain against the above named accused person who was violated the provisions of Environmental (Protection) Act, 1986.

1. The name, age and other description of the complainant :-

Government of India, Ministry of Environment and Forest, Represented through the Collector, Sundargarh, Smt.Roopa Roshan Sahoo,I.A.S being authorized by the Central Government in S O No.394(E) and so also vide letter No.19759/F&E,dated.21.10.2012 of Govt. of Odisha.

Cont..P/2

Public Prosecutor
Sundargarh Distric

COLLECTOR
SUNDARGARH

2. The name, age and other description of accused person :-
   P.K.Saraf (Director & Nominated owner)
   Narayanposi Manganese Mines of A.M & T.C (P) Limited.
   At present residing at Aryan Housc, 8th Floor, PI-Hide Lane, Kolkata
   55/1 Lake Road, Kolkata (West Bengal)

3. The date, time and place of occurrence:-

   The Narayanposi Manganese Mines of A.M & T.C (P) Limited, Narayanposi, Koira, District- Sundargarh had enhanced Manganese ore from 2000-01 to 2006-07 without obtaining the requisite prior environmental clearance from the Ministry as was required under Environmental Impact Assessment (EIA) Notification 2006.

4. The list of witnesses with addresses :-
   (i) Deputy Director of Mines, Koira, At/P.O/P.S- Koira, District- Sundargarh.
   (ii) Regional Officer, State Pollution Control Board, Rourkela, AT/PO/PS- Rourkela, District- Sundargarh.
   (iii) Deputy Collector, Mining, Collectorate, Sundargarh.

5. Nature of offence with section of statute :-

   Violation of the provision of Environment (Protection) Act, 1986 and the accused persons and required to be prosecuted under section 15 of Environment (Protection) Act, 1986.

6. Whether any information was given at the Police Station and if so, the action taken thereon:- Not applicable.

7. Whether any previous complaint regarding the same occurrence was filed, and if so, the name of the Court and the date and manner of disposal of the same :- Not applicable.

Cont..P/3

COURT FEE ONE RUPEE

Public Prosecutor
Sundargarh Distric

COLLECTOR
SUNDARGARH

8. Facts of the case:-

The above named accused person is the true owner of Narayanposi Manganese Mines of A.M & T.C (P) Limited located in village. Narayanposi, Koira under Koira Tehsil of Sundargarh district and within the jurisdiction of this Court.

It has come to the notice of Government of India, Ministry of Environment & Forest that said mining project had taken production from 2000-2001 to 2006-2007 without obtaining the requisite prior environmental clearance from the Ministry as was required under Environmental Impact Assessment (EIA) Notification 2006 which is a mandatory provision to operate the mines. This amounts to violation of provisions of Environment (Protection) Act, 1986. The intervening period during which the project was operating without environmental clearance would be treated as period of violation.

The Government of Odisha in Forest and Environment Department had instructed the Collector, Sundargarh vide their letter No. 19759/F&E dated 21.10.2012 to take legal action against the said mines as there was production from the said mines during the year 2000-2001 to 2006-2007 without obtaining the environmental clearance from the Ministry as required under provisions of Environment (Protection) Act, 1986 and thereby violating the provisions of the Act.

That, the accused persons operated mines without complying the procedural safeguard which is hazardous to the environment for which the general public of the area affected at a large as well as the Government losses huge revenue for which the accused persons is liable to be prosecute.

That, the accused persons has committed the above offence and the Complainant is being authorized by the Central Government vide the Notification S.O No. 394 (E) and file this case against the accused persons which is a Cognizable offence U/S 19 (a) of the Environment (Protection) Act, 1986.

Cont...P/4

Public Prosecutor
Sundargarh Distric

COLLECTOR
SUNDARGARH

9. Prayer :

Therefore the complainant prays that your honorable be please to take Cognizance of the offence against accused person as per Sec. 200 (a) of the Cr.P.C after perusal of the complaint petition and the documents enclosed with this petition and summon may be issued to the accused persons for his appearance as per law and after hearing the court be pleased to convict him U/S 15 of the Environment (Protection) Act, 1986.

10. Documents, if any relied upon by the complainant :

(i) Copy of letter No. 19759/F&E dated 21.10.2012 of Govt.of Odisha, Forest & Environment Department, Bhubaneswar.

(ii) Copy of Notification SO 394 of Central Government.

Public Prosecutor,
Sundargarh.
Public Prosecutor
Sundargarh District

Complainant.
COLLECTOR
SUNDARGARH

VERIFICATION

I, Smt. Roopa Roshan Sahoo, I.A.S, at present working as Collector, Sundargarh, P.O/P.S/District- Sundargarh State- Odisha do hereby solemnly affirm and verify that the contents of this petition from para 1 to 10 are true to the best of my knowledge and I sign this verification on this _____ day of April,2013.

Public Prosecutor,
Sundargarh.
Public Prosecutor
Sundargarh District

Complainant.
COLLECTOR
SUNDARGARH

CERTIFICATE

This is to certify that the complainant has not filed any other complaint case against the above accused persons in any other court.

Public Prosecutor,
Sundargarh.
Public Prosecutor
Sundargarh District

Complainant.
COLLECTOR
SUNDARGARH

IN THE HON'BLE HIGH COURT OF ORISSA, CUTTACK
(CRIMINAL MISCELLANEOUS JURISDICTION)

Crl. M.P. No. 1237 OF 2014

Code No. 0921 W

In the matter of:

An application under Articles 226 & 227 of the Constitution of India.

AND

In the matter of:

Environment (Protection) Act, 1986 and Rules made thereunder.

AND

In the matter of:

An application challenging the initiation of criminal proceedings i.e. 2 (C) CC No. 43 of 2013 pending in the Court of Learned Sub-Divisional Judicial Magistrate, Bonai.

AND

In the matter of:

An application challenging the order dated 06.12.2013 passed by the Learned Sub-Divisional Judicial Magistrate, Bonai taking Cognizance under Section 15 of the Environment (Protection) Act, 1986.

AND

P. K. MOHANTY
NOTARY CUTTACK TOWN

In the matter of:

Pradeep Kumar Saraf, aged about 57 years, (Director & Nominated Owner) Narayanposi Manganese Mines of A.M.T.C (P) Ltd S/o. Nathmal Saraf At present residing at 55/1, Lake Road, Kolkata (West Bengal)

... **Petitioners**

-Versus-

1. State of Odisha, represented through Principal Secretary, Department of Forest & Environment, Odisha Secretariat, Sachivalaya Marg, Bhubaneswar, District-Khurda.

2. The Government of India, Ministry of Environment and Forest, represented by Secretary, Ministry of Environment & Forests, Paryavaran Bhavan, CGO Complex, Lodhi Road, New Delhi - 110 003.

3. Government of India, Ministry of Environment and Forest, Represented through the Collector, Sundergarh, Smt. Roopa Roshan Sahoo, I.A.S being authorized by the Central Government in S.O. No. 394 (E) and so also vide letter No. 19759/F&E, dated 21.10.2012 of Government of Orissa.

6pp —

[O. H. C.-98]

Sl. No. of Order	Date of Order	ORDER WITH SIGNATURE	Office note as to action (if any), taken on Order

CRLMP No.1237 of 2014

02. 31.10.2014 Let one extra copy be served on learned counsel for the State appearing for the opposite party no.1 and two copies be served on learned A.S.G. appearing for Union of India by Monday (03.11.2014) to enable them to obtain instructions in the matter.

Put up this matter on 08.12.2014.

Sd/- S. C. Parija. J

Misc. Case No.326 of 2014

03. 31.10.2014 In the interim, further proceeding in 2(C) C.C.No.43 of 2013, pending in the Court of learned S.D.J.M., Bonai shall remain stayed till the next date.

Issue urgent certified copy as per rules.

Sd/- S. C. Parija. J

mp

1

OFFICE OF THE DEPUTY DIRECTOR OF MINES, KOIRA CIRCLE

KOIRA, DIST- SUNDARGARH

No. 5542 **/Mines , Dt. 26.09.2017**

NOTICE

To

M/s Aryan Mining & Trading Corporation(P) Ltd.,
Narayanposhi Iron & Mn. Ore Mines,
Koira , Dist: Sundargarh.

Whereas, it has been observed that **M/s Aryan Mining & Trading Corporation(P) Ltd.**, the mining lease holder of **Narayanposhi Iron & Mn. Ore Mines** over an area of 349.254 Ha. has undertaken production of Iron Ore from the above referred mining lease hold area in violation of Forest Conservation Act, 1980 during the period from 07.01.1998 to 31.03.2011

2. And Whereas pursuant to the interim order dt.16.05.2014 of Hon'ble Supreme Court in the matter of W.P.(C) No.114 of 2014 Common Cause vrs. Union of India and others, the CEC has submitted its final report on dt.16.10.2014 before the Hon'ble Supreme Court. In the said report the CEC under Para 24 has indicated that the annual production of iron and manganese during the years 2000-01 to 2010-2011 has been reconciled with the concerned lessees. The details of year wise production of **Iron. Ore** in the **Narayanposhi Iron & Mn. Ore Mines** mining leasehold area along with the approved limits of production under Mining Plan and Consent to Operate, the excess production there in without lawful authority (excluding the production in respect of violation of Forest Conservation Act, 1980 covered under the notice vide letter No.**5498dated 25.09.2017** and that in respect of production without / beyond the approved limit under Environmental Clearance as covered under demand notice vide letter No.**5072**dated **02.09.2017**, price of mineral and the notional value of total quantities of **Iron ore** produced without / beyond the lower of the above approved limits of production by you during the years 2000-01 to 2010-11 is annexed herewith. The price of minerals per tonne is as rationalized by the CEC in the calculation of production without / in excess of EC and as taken into consideration by the Hon'ble Supreme Court in the judgment dt.02.08.2017 in the matter of W.P. (C) 114/2014.

3. And Whereas the Hon'ble Supreme Court in its judgement dated 2.8.2017 in the W.P.(C)No.114 of 2014 has observed under para 128 that

"*. . . . . the holder of a mining lease is required to adhere to the terms of the mining scheme, the mining plan and the mining lease as well as the statutes such as the ERPA, the FCA, the Water (Prevention and Control of Pollution) Act, 1974 and the Air*

(Prevention and Control of Pollution) Act, 1981. If any mining operation is conducted in violation of any of these

requirements, then that mining operation is illegal or unlawful. Any extraction of a mineral through an illegal or unlawful mining operation would become illegally or unlawfully extracted mineral".

4. And Whereas, the Hon'ble Supreme Court in the said judgement has further observed under Para 150 that

"In our opinion, Section 21(5) of the MMDR Act is applicable when any person raises, without any lawful authority, any mineral from any land. In the event, the State Government is entitled to recover from such person the mineral so raised or where the mineral has already been disposed of, the price thereof as compensation. The words 'any land' are not confined to the mining leaser area. As far as the mining lease area is concerned, extraction of a mineral over and above what is permissible under the mining plan or under the EC undoubtedly attracts the provisions of Section 21(5) of the MMDR Act being extraction without lawful authority. . . . . "

5. Now, therefore, considering the above excess production as production without lawful authority, you are hereby noticed to show cause as to why you shall not be directed to pay a sum of Rs.**27,74,49,940.59 (Rupees twenty seven crores seventy four lakhs forty nine thousand nine hundred fourty and paise fifty nine)** only, being the price thereof towards compensation under Section 21(5) of MMDR Act, 1957 for production in excess of the lower of the approved limits under Mining plan and Consent to operate, in pursuance to the judgement dt.02.08.2017 of Hon'ble Supreme Court in the matter of W.P. (C) No.114/14 Common Cause vrs Union of India and Others.

You are further noticed that your reply, if any, to the above show cause notice should be submitted within 10 days of the date of issue of this notice. In case, you desire to be heard in the matter, you may appear in person or through your authorised representative on **10.10.2017 at 10.30 A.M.** in the office of the undersigned. You may further note that there would be no further hearing on this matter after **10.10.2017** and action as deemed proper will be taken as per the existing provisions of law.

26/9/2017

DEPUTY DIRECTOR OF MINES, KOIRA

Memo No. 5543 **/ Mines,dt.26.09.2017**

Copy forwarded to the Director of Mines ,Odisha, Bhubaneswar for favour of kind information and necessary action with reference to Directorate of Mines Letter No8666/DM,dt.25.09.2017.

26/9/2017

DEPUTY DIRECTOR OF MINES, KOIRA

Circle :- Koira

Name of the Lessee :M/s.AMTC						Name of the Lease Narayanpusi Iron & Mn Mines					Area in Hects:-349.254	
Sl. No.	Mineral	Year of Production	Production in MT	Permissible production under EC as per CEC in MT	Excess Production under EC as per CEC in MT	Production in violation of FC Act,1980	Permissible limit under Mining Plan/Scheme of Mining in MT	Permissible limit under Consent to operate in MT	Lower of the Permissible limit under MP & CTO in MT	Extra Excess Prod in violation of MP/CTO	Rate as per IBM (₹/ M.T)	Compensation Assesse (₹)-MP/CTO
1	2	3	4	5	6	7	8	9	10	11	12	13
1	Iron	2000-01	9799	0	9799	0	22722	30000	22722	0	230.43	0
-2	Iron	2001-02	16702	0	16702	0	23294	30000	23294	0	241.05	0
3	Iron	2002-03	17600	0	17600	0	25251	30000	25251	0	300.33	0
4	Iron	2003-04	52920	0	52920	0	415772	30000	30000	0	487.81	0
5	Iron	2004-05	65081	0	65081	0	497147	30000	30000	0	562.41	0
6	Iron	2005-06	89336	0	89336	0	540547	0	0	0	690.93	0
7	Iron	2006-07	66823	0	66823	0	552741	0	0	0	749	0
8	Iron	2007-08	285882	600000	0	0	573531	30000	30000	255882	1082.91	277097176.6
9	Iron	2008-09	1098384	600000	498384	0	2501100	600000	600000	0	1317.21	0
10	Iron	2009-10	1100630	600000	500630	0	3050040	600000	600000	0	1184.33	0
11	Iron	2010-11	599375	305000	0	0	4000360	600000	600000	0	1982.29	0
Total												277097176.6

26/9/2017
Deputy Director of Mines
Koira, Dist Sundargarh

Name of the Lessee: M/s.AMTC Iind						Name of the Lease : Narayanpusi Iron & Mn Mines				Area in Hects- 349.254		
Sl. No.	Mineral	Year of Production	Production in MT	Permissible production under EC as per CEC in MT	Excess Production under EC as per CEC in MT	Production in violation of FC Act,1980	Permissible limit under Mining Plan/Scheme of Mining in MT	Permissible limit under Consent to operate in MT	Lower of the Permissible limit under MP & CTO in MT	Extra Excess Prod in violation of MP/CTO	Rate as per IBM (₹/ M.T)	Compensation Assessed (₹)- MP/CTO
1	2	3	4	5	6	7	8	9	10	11	12	13
1	Mn.	2000-01	0.00	107.68	0.00	0.00	0.00	9000.00	0.00	0.00	946.71	0.00
2	Mn.	2001-02	0.00	107.68	0.00	0.00	0.00	9000.00	0.00	0.00	1124.58	0.00
3	Mn.	2002-03	1110.00	107.68	1002.32	0.00	0.00	9000.00	0.00	107.68	1125.10	121150.77
4	Mn.	2003-04	182.00	107.68	74.32	0.00	7488.00	9000.00	7488.00	0.00	1329.93	0.00
5	Mn.	2004-05	749.00	107.68	641.32	0.00	8686.00	9000.00	8686.00	0.00	1544.02	0.00
6	Mn.	2005-06	1100.00	107.68	992.32	0.00	8611.00	0.00	0.00	107.68	2150.94	231613.22
7	Mn.	2006-07	0.00	107.68	0.00	0.00	8736.00	0.00	0.00	0.00	2036.98	0.00
8	Mn.	2007-08	0.00	7800.00	0.00	0.00	8736.00	9000.00	8736.00	0.00	3225.19	0.00
9	Mn.	2008-09	1529.00	7800.00	0.00	0.00	33540.00	7800.00	7800.00	0.00	3766.25	0.00
10	Mn.	2009-10	1505.00	7800.00	0.00	0.00	36140.00	7800.00	7800.00	0.00	3576.93	0.00
11	Mn.	2010-11	2728.00	10150.00	0.00	0.00	18096.00	7800.00	7800.00	0.00	5801.46	0.00
TOTAL												352763.99

S.B.Behera
26/9/2017
Deputy Director of Mines
Koira, Dist Sundargarh

REGISTERED

Government of India
Ministry of Mines
****

No. 22/(68)/2017/RC-I

New Delhi, dated 28/12/2017

To,
The Secretary
Department of Steel & Mines
Govt. of Orissa
BHUBANESWAR-751001, ODISHA

Sub: Revision Application dated 21/12/2017 filed by M/S ARYAN MINING & TRADING CORPORATION PVT. LTD. relating to PENALTY UNDER SECTION 21 (5) OF MMDR ACT for Iron Ore, Manganese Ore over an area of 349.254 Hectare in village NARAYANPOSHI district SUNDARGARH

Sir,

I am directed to enclose herewith a copy of the above mentioned Revision Application dated filed against the State Government Order dated 24/10/2017

2. It is requested that parawise comments of the State Government on the revision application may be sent (in triplicate) within three months from the date of this communication, simultaneously endorsing a copy of the comments to the petitioner under registered post so as to enable him to give his counter comments on the comments, if any, (in triplicate) to the Central Government within one month from the date of receipt of the comments of the State Government. In case, the comments of the State Government are not received within the above mentioned period, it will be presumed that the State Government have no comments to offer and the case will be decided by the Central Government, based on the records available without waiting for the comments of the State Government.

3. Kindly acknowledge the receipt of this letter.

Yours faithfully,

(SANDEEP KUMAR)
SECTION OFFICER
Tel-No.-011-23384070

Encl: As above

Copy for information to:-

M/S ARYAN MINING & TRADING CORPORATION PVT. LTD.
P1, HIDE LANE, 8TH FLOOR, ARYAN HOUSE,
KOLKATA-700073

SPPED POST

Government of India
Ministry of Mines
(Revision Cell)

Shastri Bhawan,
Dr. Rajendra Prasad Road,
New Delhi, the 28th December, 2017

Revision Application No.22/(53)/2017/RC-I & 26 others (list enclosed).

To

The Secretary,
Department of Steel and Mines,
Government of Odisha,
Bhubaneswar-751001,
Odisha

Sub:- Revision Applications under Rule 35 of the Minerals (other than Atomic & Hydro Carbons Energy Minerals) Concession Rules, 2016.

Sir,

I am directed to refer to the above subject and to forward herewith certify copy of the proceeding dated 27.12.2017 passed by Revisionary Authority in the Central Government u/s 30 of MMDR Act, 1957 in this regard for the Revision Applications filed by various Revisionists against the orders of the State Government of Odisha. The list of the Revisionists is enclosed.

Yours faithfully,

28/12/2017

(Sandeep Kumar)
Section Officer
Tel:-011-23384070

Encl: Copy of the Proceeding (pp:01-06)

Copy to:- (As per list enclosed).

Annexure:-

S.No	RA No.	Name of the Revisionist	Revisionists Address
1	22/53/2017/RC-I	M/s Rungta Sons Pvt. Ltd.	R/O 8a, Express Tower, 42a Shakespeare Sarani, Kolkata-700017, West Bengal,
2	22/54/2017/RC-I	M/s Rungta Sons Pvt. Ltd.	R/O 8a, Express Tower, 42a Shakespeare Sarani, Kolkata-700017, West Bengal,
3	22/55/2017/RC-I	M/s Mangilall Rungta	Rungta House, Chaibasa, Distt. West Singhbhum, Jharkhand,
4	22/56/2017/RC-I	M/s M G Mohanty	2/A, Forest Park, Bhubaneswar-751009, Odisha,
5	22/58/2017/RC-I	M/s Tata Steel Limited	Office At Bombay House, 24 Homi Modi Street, Mumbai-400001, Maharasthra,
6	22/59/2017/RC-I	M/s Tata Steel Limited	Office At Bombay House, 24 Homi Modi Street, Mumbai-400001, Maharasthra,
7	22/60/2017/RC-I	M/s Tata Steel Limited	Office At Bombay House, 24 Homi Modi Street, Mumbai-400001, Maharasthra,
8	22/61/2017/RC-I	M/s Tata Steel Limited	Office At Bombay House, 24 Homi Modi Street, Mumbai-400001, Maharasthra,
9	22/62/2017/RC-I	M/s Tata Steel Limited	Office At Bombay House, 24 Homi Modi Street, Mumbai-400001, Maharasthra,
10	22/63/2017/RC-I	M/s Tata Steel Limited	Office At Bombay House, 24 Homi Modi Street, Mumbai-400001, Maharasthra,
11	22/64/2017/RC-I	M/s Tata Steel Limited	Office At Bombay House, 24 Homi Modi Street, Mumbai-400001, Maharasthra,
12	22/65/2017/RC-I	M/s Essel Mining & Industries Ltd.	18th Floor, Industry House,10-Camac Street, Kolkata-17, West Bengal,
13	22/66/2017/RC-I	M/s Essel Mining & Industries Ltd.	18th Floor, Industry House,10-Camac Street, Kolkata-17, West Bengal,
14	22/67/2017/RC-I	M/s Essel Mining & Industries Ltd.	18th Floor, Industry House,10-Camac Street, Kolkata-17, West

			Bengal,
15	22/68/2017/RC-I	M/s Aryan Mining & Trading Corporation Pvt. Ltd.	Aryan House, P-1, Hide Lane, 8th Floor, Kolkata-700073, West Bengal,
16	22/69/2017/RC-I	M/s Kalinga Mining Corporation	At-Samanta Niwas Sheikh Bazar, Cuttack-753008, Odisha,
17	22/71/2017/RC-I	Shri Satyajit Pradhan	Ga-75a, Niladri Vihar, Bhubaneswar, Odisha,
18	22/72/2017/RC-I	Shri Sunandan Pradhan	Tala Telenga Bazar, Cuttack, Odisha-753009
19	22/73/2017/RC-I	Sri Pawan Kumar Ahluwalia	P.B.No.3, Near MMTC Weigh Bridge, At/P.O. Barbil, Distt. Keonjhar-758035, Odisha,
20	22/74/2017/RC-I	Sri Kamaljeet Singh Ahluwalia	P.B.No.3, Near MMTC Weigh Bridge, At/P.O. Barbil, Distt. Keonjhar-758035, Odisha,
21	22/75/2017/RC-I	M/s Kaypee Enterprises	P.B.No.3, Near MMTC Weigh Bridge, At/P.O. Barbil, Distt. Keonjhar-758035, Odisha,
22	22/76/2017/RC-I	Sri Kamaljeet Singh Ahluwalia	P.B.No.3, Near MMTC Weigh Bridge, At/P.O. Barbil, Distt. Keonjhar-758035, Odisha,
23	22/77/2017/RC-I	Shri C.P.Sharma	Amla Tola, Chaibasa-833201, Distt. Singhbhum West, Jharkhand,
24	22/78/2017/RC-I	M/s Kanakdhara Mining & Minerals Pvt. Ltd.	Main Road, Barbil, Keonjhar, Odisha,
25	22/79/2017/RC-I	M/s Lal Traders & Agencies (P) Ltd.	7th Waterloo Street, 2nd Floor, Kolkata-700069, West Bengal,
26	22/80/2017/RC-I	M/s Ghanashyam Mishra & Sons(P) Ltd.	7th Waterloo Street, 2nd Floor, Kolkata-700069, West Bengal,
27	22/81/2017/RC-I	M/s Kalinga Mining Corporation.	At-Samanta Niwas Sheikh Bazar, Cuttack-753008, Odisha,

Date of Hearing: 27.12.2017

These Revision Applications have been filed challenging the orders passed by the State Government seeking to recover price of the mineral stated to have been produced without or in excess of the lower approved limit under the Mining Plan/Consent to Operate (CTO). The said demand has been sought to be levied under the provisions of Section 21 (5) of the Mines & Minerals (Development & Regulation) Act, 1957 in pursuance to the judgment dated 02.08.2017 of the Hon' ble Supreme Court in Writ Petition No. 114/2014 in Common Cause Vs. Union of India & Ors..

2. After receipt of the Revision Applications, Notices were issued to the State Government asking to submit their replies and to attend the hearing on 27.12.2017 at 11:00 hrs. No one appeared on behalf of the State Government. However, a written communication was received from the State Government of Odisha bearing No.10529/LC-05/2016 (Pt.) dated 23.12.2017 requesting two month time so as to enable the State Government to file the required replies in all the cases.

2.1 The State Government has further stated that they have not received copies of the Revision Applications as yet and no advocate has been engaged to conduct the case on behalf of the State Govt.

3. These Revision Applications were taken up and heard together as similar issue is involved in all 27 cases. The Counsels appearing on behalf of the Revisionists who were heard individually submitted that the Impugned Orders are illegal and contrary to the provisions of MMDR Act, 1957, the Water (Prevention and Control of Pollution) Act, 1974, The Air (Prevention and Control of Pollution) Act, 1981 and the judgement dated 02.08.2017 of the Hon'ble Supreme Court in the WP (C) No. 114/2017.

3.1 The learned Counsels appearing on behalf of the Revisionists submitted that the Revision Applications should be admitted as there is no delay in filing the Revision Applications and there is adequate merit in the revision applications which requires adjudication by the Revisionary Authority under section 30 of MMDR Act, 1957.

3.2 The learned Counsels further submitted that the consent to operate in any event is merely a consequential clearance to the Environmental Clearance. This is evident because in the absence of an Environmental Clearance, the consent to operate cannot be granted.

3.3 The learned Counsels further submitted that the impugned Orders are in violation of the principles of natural justice and is therefore *void ab initio* and a nullity in the eye of law from its very beginning. The learned Counsels stated that both the show cause notices and the impugned Orders are in a standard proforma and are therefore reflective of complete non-application of mind. The demands raised through the Impugned Orders are for alleged violations of MP/CTO pertaining to period more than 17 years old but the Revisionists were given barely 10 days to defend their position.

3.4 The learned counsels further pointed out that even the preliminary submissions raised by the lessees in their reply to the show-cause notice have not been considered and the Deputy Director of Mines has mechanically chosen to confirm the demand raised in the show-cause notices. It was further stated that the concerned DDM heard all the cases on a single day and disposed off the same which clearly establishes that it was only an empty formality.

4. The learned Counsels also referred to and relied upon the following observations of the Hon'ble Supreme Court made on 13.12.2017 in WP (C) No. 114/2017 (Common Cause vs. UOI & Ors.) :-

(i) However, we make it clear that if there is any demand raised by the State of Odisha with regard to non-compliance of consent to operate or mining plan threshold, the **mining lease holders are at liberty to challenge the demand in an appropriate forum.**

(ii) In case, the demands raised by the State of Odisha are paid by 31st December, 2017, the mining operations will not be stopped because of a challenge to non-compliance of the consent to operate/mining plan threshold.

5. I have carefully taken into consideration the submissions made by the learned Counsels appeared on behalf of the Revisionists. I have also taken into consideration the Impugned Orders wherein it is stipulated that the demand raised through the impugned Order is required to be paid on or before 31.12.2017. The learned Counsels appearing on behalf of the Revisionists have submitted that the impugned orders of the State Government are illegal and are in complete violation of the principles of natural justice, therefore, the Impugned Orders are required to be stayed till disposal of these RAs.

6. Having considered the submissions of the ld. Counsels, the Revision Applications are **admitted.** I have also considered the submissions of the learned Counsels regarding stay and in view of the fact that the State Government is also seeking one month's time to submit their reply, it would be in the interest of justice to stay the operation of the impugned Order till the next date of hearing.

7. All these Revision Applications are listed for hearing on **22.01.2018** at **2:30 PM.** Issue notices accordingly. The State Government is directed to submit their response/comments well in advance of the date of hearing with a copy to Revisionists so as to enable them to submit counter-reply, if any. In the meanwhile, the State Government shall not take any coercive measures to recover the amounts specified in the impugned orders.

Attested
12/2017

संदीप कुमार/SANDEEP KUMAR
अनुभाग अधिकारी/Section Officer
खान मंत्रालय/Ministry of Mines
भारत सरकार/Govt. of India
शास्त्री भवन/Shastri Bhawan
नई दिल्ली/New Delhi

(Niranjan K.Singh)
Joint Secretary &
Revisionary Authority

Annexure:-

S.No	RA No.	Revisionist	Advocate(s)/representative of Revisionists	Advocate(s) /representatives of the State Govt.	Impugned Order No./Date
1	22/53/2017/RC-I	M/s Rungta Sons Pvt. Ltd.	Shri Naveen Kumar, Advocate, Shri R.R.Swain, Advocate & Shri Nishi Kant Singh, Advocate	None	5256/Mines dated 23.10.2017
2	22/54/2017/RC-I	M/s Rungta Sons Pvt. Ltd.	Shri Naveen Kumar, Advocate, Shri R.R.Swain, Advocate & Shri Nishi Kant Singh, Advocate	None	5927/Mines dated 24.10.2017
3	22/55/2017/RC-I	M/s Mangilall Rungta	Shri Naveen Kumar, Advocate, Shri R.R.Swain, Advocate & Shri Nishi Kant Singh, Advocate	None	5222/Mines dated 23.10.2017
4	22/56/2017/RC-I	M/s M G Mohanty	Shri Biswajit Das, Advocate & Shri Mohit Sharma, Advocate	None	5974/Mines dated 24.10.2017
5	22/58/2017/RC-I	M/s Tata Steel Limited	Shri Ashok Parija, Sr. Advocate, Ms. Nandini Gore, Advocate, Ms. Tahira Kananjawala, Advocate, Ms. Sonia Nigam,Advocate & Shri Naveen Kumar, Advocate	None	5186/Mines dated 23.10.2017
6	22/59/2017/RC-I	M/s Tata Steel Limited	Shri Ashok Parija, Sr. Advocate, Ms. Nandini Gore, Advocate, Ms. Tahira Kananjawala, Advocate, Ms. Sonia Nigam,Advocate & Shri Naveen Kumar, Advocate	None	5182/Mines dated 23.10.2017
7	22/60/2017/RC-I	M/s Tata Steel Limited	Shri Ashok Parija, Sr. Advocate, Ms. Nandini Gore, Advocate, Ms. Tahira Kananjawala, Advocate, Ms. Sonia Nigam,Advocate & Shri Naveen Kumar, Advocate	None	5184/Mines dated 23.10.2017
8	22/61/2017/RC-I	M/s Tata Steel Limited	Shri Ashok Parija, Sr. Advocate, Ms. Nandini Gore, Advocate, Ms. Tahira Kananjawala, Advocate, Ms. Sonia Nigam,Advocate & Shri Naveen Kumar, Advocate	None	5190/Mines dated 23.10.2017

9	22/62/2017/RC-I	M/s Tata Steel Limited	Shri Ashok Parija, Sr. Advocate, Ms. Nandini Gore, Advocate, Ms. Tahira Kananjawala, Advocate, Ms. Sonia Nigam,Advocate & Shri Naveen Kumar, Advocate	None	5953/Mines dated 24.10.2017
10	22/63/2017/RC-I	M/s Tata Steel Limited	Shri Ashok Parija, Sr. Advocate, Ms. Nandini Gore, Advocate, Ms. Tahira Kananjawala, Advocate, Ms. Sonia Nigam,Advocate & Shri Naveen Kumar, Advocate	None	5188/Mines dated 23.10.2017
11	22/64/2017/RC-I	M/s Tata Steel Limited	Shri Ashok Parija, Sr. Advocate, Ms. Nandini Gore, Advocate, Ms. Tahira Kananjawala, Advocate, Ms. Sonia Nigam,Advocate & Shri Naveen Kumar, Advocate	None	5192/Mines dated 23.10.2017
12	22/65/2017/RC-I	M/s Essel Mining & Industries Ltd.	Shri Naveen Kumar, Advocate, Shri R.R.Swain, Advocate & Shri Nishi Kant Singh, Advocate	None	5228/Mines dated 23.10.2017
13	22/66/2017/RC-I	M/s Essel Mining & Industries Ltd.	Shri Naveen Kumar, Advocate, Shri R.R.Swain, Advocate & Shri Nishi Kant Singh, Advocate	None	5939/Mines dated 24.10.2017
14	22/67/2017/RC-I	M/s Essel Mining & Industries Ltd.	Shri Naveen Kumar, Advocate, Shri R.R.Swain, Advocate & Shri Nishi Kant Singh, Advocate	None	5230/Mines dated 23.10.2017
15	22/68/2017/RC-I	M/s Aryan Mining & Trading Corporation Pvt. Ltd.	Shri Naveen Kumar, Advocate & Shri Nishi Kant Singh, Advocate	None	6015/Mines dated 24.10.2017
16	22/69/2017/RC-I	M/s Kalinga Mining Corporation	Shri Naveen Kumar, Advocate & Shri Nishi Kant Singh, Advocate	None	5216/Mines dated 23.10.2017
17	22/71/2017/RC-I	Shri Satyajit Pradhan	Shri Naveen Kumar, Advocate & Shri Nishi Kant Singh, Advocate	None	5166/Mines dated 23.10.2017
18	22/72/2017/RC-I	Shri Sunandan Pradhan	Shri Naveen Kumar, Advocate & Shri Nishi Kant Singh, Advocate	None	5160/Mines dated 23.10.2017
19	22/73/2017/RC-I	Sri Pawan Kumar Ahluwalia	Shri L.Mahapatra, Advocate	None	6012/Mines dated 24.10.2017
20	22/74/2017/RC-I	Sri Kamaljeet Singh	Shri L.Mahapatra, Advocate	None	5238/Mines

		Ahluwalia			dated 23.10.2017
21	22/75/2017/RC-I	M/s Kaypee Enterprises	Shri L.Mahapatra, Advocate	None	5262/Mines dated 23.10.2017
22	22/76/2017/RC-I	Sri Kamaljeet Singh Ahluwalia	Shri L.Mahapatra, Advocate	None	5226/Mines dated 23.10.2017
23	22/77/2017/RC-I	Shri C.P.Sharma	Shri Pabitra K.Ray, Advocate & Shri Anil K. Sharma, Legal Head	None	5995/Mines dated 24.10.2017
24	22/78/2017/RC-I	M/s Kanakdhara Mining & Minerals Pvt. Ltd.	Shri Pabitra K.Ray, Advocate	None	5971/Mines dated 24.10.2017
25	22/79/2017/RC-I	M/s Lal Traders & Agencies (P) Ltd.	Shri Ashok K.Parija, Sr. Advocate, Shri Dhananjaya Mishra, Advocate, Shri R.M.Patnaik, Advocate & Shri Arnav Dash, Advocate	None	2938/Mines dated 09.11.2017
26	22/80/2017/RC-I	M/s Ghanashyam Mishra & Sons(P) Ltd.	Shri Ashok K.Parija, Sr. Advocate, Shri Dhananjaya Mishra, Advocate, Shri R.M.Patnaik, Advocate & Shri Arnav Dash, Advocate	None	2970/Mines dated 09.11.2017
27	22/81/2017/RC-I	M/s Kalinga Mining Corporation.	Shri Naveen Kumar, Advocate * Shri Nishi Kant Singh, Advocate	None	5220/Mines dated 23.10.2017

Attested

संदीप कुमार/SANDEEP KUMAR
अनुभाग अधिकारी/Section Officer
खान मंत्रालय/Ministry of Mines
भारत सरकार/Govt. of India
शास्त्री भवन/Shastri Bhawan
नई दिल्ली/New Delhi

Final Order No. 213/2018 to 266/2018
Dated: 26.11.2018

Revision Authority (Central Government) under Mines & Minerals (Development & Regulation) Act, 1957

M/s. Serajuddin and 53 other (Annexure A) **Revisionist/Petitioner**

Vs

State Government of Odisha **Respondent**

COMMON ORDER

[Under Section 30 of the Mines and Minerals (Development and Regulation) Act, 1957 (MMDR ACT) and Rule 26 of the Minerals (other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016 (MCR,2016]

These Revision Applications, involving similar issues have been considered together with the consent of learned Counsels for the parties as they had submitted that all the applications had been filed on the same lines except for the mining lease areas and amounts sought to be recovered. By way of this common order, I propose to dispose of these revision applications seeking to impugn the orders passed by the Government of Odisha raising demands under Section 21(5) of the Mines and Minerals (Development & Regulation) Act, 1957 ('MMDR' Act for short) for production of mineral Iron Ore/Manganese without/in excess of the limits approved under the Mining Plan (MP) and Consent to Operate (CTO). The prayers made in almost all Revision Applications are similar, i.e. to allow the Revision Applications and to set aside the impugned orders issued on behalf of the State of Odisha under section 21 (5) of the MMDR Act, 1957.

2. The learned Counsels of the Petitioners referred to and relied upon the observation of the Hon'ble Supreme Court made on 13.12.2014 in WP (C) No.114/2017 (Common Cause vs. UoI & Others), which reads as under:

(i) *However, we make it clear that if there is any demand raised by the State of Odisha with regard to non-compliance of 'Consent to Operate' or 'Mining Plan' threshold, the mining lease holders are at liberty to challenge the demand in an appropriate forum.*

(ii) In case, the demands raised by the State of Odisha are paid by 31st December, 2017, the mining operations will not be stopped because of a challenge to non-compliance of the 'Consent to Operate'/ 'Mining Plan threshold'.

Hence, the Revision Applications have been filed to challenge the demand raised by the State of Odisha.

3. All the 54 Revision Applications were taken up together and heard on 9.10.2018. As the arguments remained inconclusive, the Revision Applications were heard again on 30.10.2018. A list of the counsels/representatives appearing on behalf of the parties on each of the days is annexed.

4. The background of the case as stated by and on behalf of the State Government and the submissions made by the learned Counsel, Ms. Kirti Mishra, appearing on behalf of the State Government is summarized below-

(i) Section 21 (5) of the MMDR Act, 1957 empowers the State Government to recover the mineral raised by any person without any lawful authority or the price thereof if the minerals have already been disposed of. Further, the State Government is also entitled to recover from such person, rent, royalty tax, as the case may be for the period during which such person occupied the land without any lawful authority.

(ii) That a person gets authority under the law to raise minerals by virtue of a mining lease but actual operation also requires sanction under other applicable legislations like the Environment Protection Act, 1986, the Air and Water Acts. Any mining operation conducted by a mining lease holder in absence of clearances under any of these statutes would render the raising of mineral unlawful/illegal. Further, conducting of mining operation without complying with the terms and conditions of such clearances would also be considered as unlawful. Therefore, if a lessee raises minerals without said clearances or in

violation of any of the terms and conditions, he would be said to have raised the minerals without lawful authority and becomes liable under section 21 (5) of the said Act.

(iii) That the Hon'ble Supreme Court in its judgment dated 02.08. 2017 in the matter of Common Cause vs. Union of India & Others has, while interpreting the provisions of section 21 (5) of the MMDR Act, 1957, observed that not only mining outside the lease area would amount to illegal mining activity but also mining activity within the lease area in contravention of the statutory clearances also amounts to illegal/unlawful mining activity attracting the provisions of section 21 (5) of the said Act. In this context, the State Government has referred to and relied upon the observations of the Hon'ble Supreme Court in the said judgment dated 02.08. 2017 made in the paragraphs 128, 139, 150, 153, 156, 186 and 225.

(iv) That according to the aforesaid decision of the Apex Court, Section 21 (5) is not only applicable with reference to violation of EC & FC but also for violation of limits prescribed under the MP/CTO as well and accordingly a lessee is liable to pay the price of the mineral produced in excess of the lower of the approved limit under the Mining Plan and Consent to Operate.

(v) That as the revisionists have raised minerals in excess of the lower of the approved limit of production under the Mining Plan and CTO during the year 2000-01 to 2010-11, therefore, the revisionists are liable for payment of compensation under the provisions of section 21 (5) of the MMDR Act and in view of the judgment of Hon'ble Supreme Court as stated above. The revisionists are liable to pay the compensation as demanded vide the impugned orders, being the price of the mineral produced without/in excess of the Mining Plan/CTO following the same principle as adopted by the Central Empowered Committee (CEC) while rationalizing the demand for violation of EC.

(vi) The State Government has also stated that pursuant to the interim order dated 16. 05. 2014 of the Hon'ble Supreme Court passed in WP No. 114/2014 in the case of Common Cause Vs. Union of India & others (hereinafter referred to as the Common Cause Case), the CEC in its final report submitted to the Apex

Court has stated that the annual production of iron ore and manganese during the years 2000-01 to 2010-11 has been reconciled with the concerned lessees. The price of minerals per ton was also rationalized by the CEC and accordingly the value of the mineral raised without/in excess of EC has been calculated.

5. Shri Ashok Parija, the learned Senior Advocate appearing on behalf of some revisionists broadly covered the issues to be dealt with and assailed the impugned orders on the following grounds:-

(i) The Impugned Order has been passed in violation of the principles of natural justice in as much as a perusal of the impugned orders would demonstrate that the submissions of the Revisionists made in its show-cause reply or made during the personal hearing, have not at all been considered. Thus, the impugned orders, being a non-speaking order, are a nullity in the eyes of law.

(ii) A perusal of the various impugned orders passed by the State Government would demonstrate that they are virtually identical, being pre-formatted/cyclo-styled orders, where only the amounts and details of the lessees have been changed. The same is indicative of non-application of mind.

(iii) The impugned orders have been passed in complete disregard to the judgment of the Hon'ble Supreme Court, especially observations made in paragraph 156, whereby the issue of excess production has been fully and comprehensively decided.

(iv) The State Government and the Revisionists were both parties before the Hon'ble Supreme Court and the directions passed in the said matter are applicable and fully binding on both. It is not now open to the State Government to re-agitate the issues which have already been decided by the Supreme Court. The State Govt. has no jurisdiction to split up or to divide or to add any part of the cause of action which was the subject matter of the Hon'ble Supreme Court's judgment dated 02.08.2017.

(v) The very period for which the present Impugned Orders have been passed was the subject matter of the judgment of the Hon'ble Supreme Court, and at paragraph 184, the Supreme Court has clearly held that only one set of compensation would be payable for the 'common period'.

(vi) The Revisionists have already discharged the demand raised by the State Government pursuant to the Hon'ble Supreme Court's judgment dated 02.08.2017. The present demands raised by the impugned orders is therefore, clearly over and above the earlier demand. Furthermore, no reasons have been assigned as to how the figures in the earlier demand were considered for working out the issue of 'overlap' or 'common period' as required in terms of para 184 of the judgment dated 02.08.2017.

(vii) The original demand raised by the State Government was in respect of EC/CTO/MP, and the CEC in its wisdom considered all three, and recommended that EC would be the most critical criteria for determination of excess production. The said rationalisation of the CEC has been expressly accepted and approved by the Hon'ble Supreme Court in its Judgment in paragraph 156.

(viii) That reliance placed by the State Government on Para -128 of the judgment dated 02.08.2017 of the Hon'ble Supreme Court is completely misplaced and out of context as the same are general statements/principles regarding broader scope and applicability of Section 21 (5) of the MMDR Act, 1957 and the same do not constitute operative portion of the judgment qua the parties to the case.

6. The learned Senior Counsel while elaborating the background of the issue at hand stated that initially the State of Odisha raised demand notice under Section 21(5) of MMDR Act, 1957 to the lessees for recovery of prices of iron and/or manganese mineral, which was produced and sold without/beyond Environmental Clearance and/or approved Mining Plan/Scheme of Mining and/or Consent to Operate. The amount for which the notices were issued adds upto Rs.61,705.70 crore (Para-43 of the final CEC report dated 16.10.2014). When the Revisionary Authority was approached, it granted a stay on 'combined/composite demand' in respect of

MP/CTO/EC and while these cases were pending before the Revisionary Authority, a PIL (Public Interest Litigation) was filed in the Hon'ble Supreme Court by an NGO in the name of '*Common Cause.'* In this PIL, the Hon'ble Apex Court vide an order directed the CEC to determine the compensation to be payable by these lessees w.r.t. CTO/MP/EC. The learned Senior Counsel further stated that the CEC, in its report dated 16.10.2014, was of the view that -- *"it may be appropriate that 30% of the notional value of the iron and manganese produced by each of the lessees without/in excess of the environmental clearances may be directed to be recovered from the concerned lessees and with the explicit understanding the concerned lessees as well as the officers will continue to be liable for action under the provisions of the respective Act"*

The Hon'ble Supreme Court agreed and accepted the recommendations of the CEC subject to one modification that instead of 30 %, compensation would be payable at 100 % of the price of the mineral, as rationalized by CEC. The Hon'ble Supreme Court has held as under:

Para-156

> *"Since the recommendation made by the CEC in this regard is not totally unreasonable, we accept that the compensation should be payable from 2000-01 onwards at 100% of the price of the mineral, as ratinalised by the CEC."*

7. The learned Senior Counsel appearing on behalf of the revisionists further submitted that based on the Final Report of the CEC dated 16.10.2014 (particularly Paras 20 (vi) and 21), which are reproduced below, the Hon'ble Supreme Court delivered its judgment dated 02.08.2017 wherein it accepted and affirmed the rationalization carried out by the CEC.

"Para-20 (vi)

> *"The Environmental Clearance is granted only after the mining plan has been approved. Thus, a mining lease with approved mining plan may not have environmental clearance. However, vice-versa is not possible. The environmental clearance is granted for annual production which is either equal to or less than the quantity stated in the approved mining plan. The consent*

to operate is granted only after the environmental clearance has been granted and is limited to quantity for which the environmental clearance has been granted."

Para-21

"The CEC, in the above background, is of the view that for the purpose of ascertaining the production without/beyond the above said statutory approvals namely, environmental clearance, approved mining plan/scheme of mining and 'Consent to Operate', it is the year-wise production vis-à-vis that permitted under the environmental clearance, which is the most critical and relevant criteria and the mining leases have accordingly been dealt within the subsequent part of the report."

8. The learned Senior Counsel in this context, referred to the following two paragraphs of the said judgment of the Hon'ble Supreme Court in the Common Cause case, wherein it has been held as under:

Para-154

"The issue now is with regard to the calculations made by the CEC with regard to the production of iron ore and manganese ore without or in excess of the EC and/or the Mining Plan as already mentioned above, the figures were not disputed (except by JSPL and SMPL). Therefore, only the application of the Figures requires consideration and so we do not need to examine each individual case. However, to understand and appreciate the manner in which the CEC has arrived at its figures, we may state that this has been specifically mentioned by the CEC in its report."

Para-225.

"The amount determined as due from all the mining lease holders should be deposited by them on or before 31st December, 2017. Subject to W. P.(C) No.114/2014 etc. and only after compliance with statutory requirements and full payment of compensation and other dues, the mining lease holders can re-start their mining operations."

9. It was further submitted that based on the Hon'ble Supreme Court's judgment, the earlier Revision Applications pending before this Revisionary Authority were disposed of vide order dated 14.08.2017 whereby it was agreed that the earlier demand had been rendered infructuous, and a new demand as agreed to before the CEC would be raised by the State Government in compliance of the judgment dated 02.08.2017.He further stated that in compliance of the directions of the Hon'ble Supreme Court to pay the demand raised on or before 31.12.2017 in order to restart their mining operations, most of the lessees have paid the amount raised towards compensation.

10. It was strenuously argued by the learned Senior Counsel that the Government of Odisha is seeking to raise the demand(s) by segregating each of the parameters i.e. EC, MP and CTO, which is in contravention of the Common Cause judgment. He further submitted that the Hon'ble Supreme Court in the said judgment has duly considered all the parameters including EC/FC/CTO/MP and the Hon'ble Supreme Court had deemed it fit to restrict the recovery of the compensation on account of minerals extracted in excess/without EC/FC only.

11. While relying upon the Common Cause judgment, he further contended that even in case of any overlap between the parameters being considered, only one set of compensation is payable by the mining lease holders to the State of Odisha. In this context, the learned senior counsel cited Para-184 of the *Common Cause* judgment, which states:

> *"To the extent of the overlap or the common period, obviously only one set of compensation is payable by the mining lease holder to the State of Odisha. We order accordingly. However, we make it clear that whatever payment has already been made by the mining lease holders towards NPV, additional NPV, or penal compensatory afforestation is neither adjustable nor refundable since that falls in a different category altogether."*

12. The learned Senior Counsel also contended that calculation sheet annexed to the impugned notices clearly shows that the demand pertaining to excess production in violation of MP/CTO is covered under permissible production limit in EC as per CEC as is evident from column 5. It was further submitted that the CTO in any event is a

consequential clearance to the EC. This is evident from the fact that in the absence of the EC, the consent to operate cannot be granted.

13. While other learned counsels appearing on behalf of the revisionists generally agreed with the arguments advanced by Shri Ashok K. Parija and reiterated the same, some other counsels, however, made additional submissions. Shri S.N. Mohanty, learned Senior Counsel for the lessees, drew my attention to the discrepancies in the calculation sheets appended with the impugned demand notices issued pursuant to the judgment of the Hon'ble Supreme Court. It was submitted that the State Government having already collected royalty computed on the basis of quantity of ore already extracted which is stated in column 5 of the Statement in Annexure to the Show Cause Notice and having removed the said quantity of ore from the lease area upon grant of transit permit, the State Government now cannot treat the said quantity as production without lawful authority and raise the demand to pay the price of ore as compensation with reference to provisions of Section 21 (5) of the MMDR Act.

14. In this context, it was further reiterated that EC and FC are mutually exclusive and hence, have been dealt with by the Hon'ble Supreme Court under separate heads whereas, MP/CTO/EC are not mutually exclusive as reflected in the report of CEC as well as the Hon'ble Supreme Court's judgment. The learned Senior Counsel emphasized that EC/MP/CTO have been considered together by CEC based on technical reasons as elaborated at Para- 20(vi) & 21 of its final report submitted to the Apex Court. The Environmental Clearance is a comprehensive document and it includes all the terms and conditions of CTO granted under Air (Prevention and Control of Pollution) Act and Water (Prevention and Control of Pollution) Act. The CTO is granted only after the EC has been granted and is limited to the annual production for which EC has been granted.

15. The learned Senior Counsel further submitted that the Hon'ble Supreme Court, while referring to EC and FC was mindful of overlapping and so dealt with them under separate heads. In this regard, the learned counsel cited Para-18 of the C*ommon Cause* judgment:

Para-18.

In its final report, CEC has dealt with the following ten topics:

(i) Production of iron ore and manganese ore without/in excess of the environment clearance/ Mining Plan/Consent to Operate.

(ii) Mining leases operated in violation of the Forest (Conservation) Act, 1980.

X X X X X

16. The learned Senior Counsel argued that the Hon'ble Supreme Court in its judgment under the head "Conclusions on the issues of mining without an EC or FC or both" has further clarified this issue in Para 186, which reads as below:

Para-186.

To avoid any misunderstanding, confusion or ambiguity, we make the following very clear.

(8) Any mining activity carried on after 7th January, 1998 without an FC amounts to illegal or unlawful mining in terms of the provisions of Section 21(5) of MMDR Act attracting 100% recovery of the price of the extracted mineral that is disposed of.

(9) In the event of any overlap, that is, illegal or unlawful mining without an FC or without an EC or without both would attract only 100% compensation and not 200% compensation. In other words, only one set of compensation would be payable by the mining lease holder.

17. Shri Raj Kumar Mehta, the learned counsel appearing on behalf of Odisha Mining Corporation Limited also supported the submissions made on behalf of the revisionists. He, however, pointed out that the Orissa Mining Corporation Ltd. has already deposited the impugned demand along with interest, but without prejudice to the rights and contentions in the Revision Application. It was submitted that the assertions and averments made on behalf of the Respondent State Government are misconceived, untenable and contained incorrect interpretation of the provisions of the relevant Acts and Rules governing the field.

18. On 30.10.2018, the day fixed for conclusion of arguments, Ms.Kirti Mishra, the learned counsel for the State Government, submitted that M/s Tata Steels Ltd., one of the revisionists, has made a representation to the State Government that the demand raised under FC has been wrongly calculated and that after enquiry, the demand raised against them has been revised. As similar mistakes concerning calculation of the demand in respect of FC may be there in other cases too, the State Government is willing to consider any representation submitted by the lessees concerning mistakes in calculation of the demand raised on account of violation of FC. If the demand on account of violation of FC is revised, there will be consequential revision of the demand raised vide the impugned orders. It was submitted that the State Government is willing to accommodate and calculate the demands afresh but only with respect to the FC and no other head. She further stated that error is bound to happen in calculation but it doesn't necessarily mean that calculation with respect to MP/CTO is also wrong. In view of this, it was proposed that these Revision cases may be remanded back so as to enable the State Government to consider any such representation submitted/to be submitted by the lessees.

19. The learned Counsels appearing on behalf of the revisionists agreed that the Revision Applications, involving same subject matter, may be remanded back as proposed, but the issues raised in the matter may be kept open. It was further argued that the State Government be directed to consider the submissions made by the revisionists and pass a reasoned order.

20. I have considered the submissions made by the learned counsels for the parties and have gone through the records. I have also gone through the impugned orders, whereby the revisionists have been asked to pay the compensation under Section 21(5) of MMDR Act, 1957 for production without/in excess of the Mining Plan & CTO. Taking into consideration the facts and circumstances of the matter and the submissions made before me during the course of hearing, it appears to me that the points raised by the lessees ought to have been considered and the reasoning to accept or reject the submissions must have been given by the State Authority. On perusal of the Show Cause Notices and the Impugned Orders raising the demand, it is apparent that the submissions advanced by the parties in their reply to the show

cause notices were not taken into consideration and the impugned orders were passed without recording the reasons.

21. In view of this, these Revision Applications are remanded to the State Government with the direction that the concerned Authority, not below the rank of Secretary or Director of Mines, shall hear the matters afresh and pass a detailed and reasoned order. These Revision Applications are disposed of accordingly.

(Niranjan K. Singh)
Joint Secretary &
Revisionary Authority

Annexure 'A'

S.No	RA No.	Revisionist	Advocate(s)/representative of Revisionists
1	22/20/2017/RC-I	M/s Serajuddin & Co.	Shri Ashok Kumar Parija, Sr. Advocate, Shri R.M.Patnaik, Advocate, Shri Dhananjaya Mishra, Advocate, Shri Arnav Dash, Advocate & Shri Avnish Kumar Sharma, Advocate
2	22/21/2017/RC-I	M/s Tarini Minerals Pvt. Ltd.,	Shri Ashok Kumar Parija, Sr. Advocate, Shri R.M.Patnaik, Advocate, Shri Dhananjaya Mishra, Advocate, Shri Arnav Dash, Advocate & Shri Avnish Kumar Sharma, Advocate
3	22/22/2017/RC-I	M/s Tarini Minerals	Shri Naveen Kumar, Advocate & Shri Prabhat Kumar Rai, Advocate
4	22/23/2017/RC-I	M/s Geetarani Mohanty	Shri Naveen Kumar, Advocate & Shri Prabhat Kumar Rai, Advocate
5	22/24/2017/RC-I	M/s S.N.Mohanty	Shri Sanjit Mohanty Sr. Advocate, Shri Naveen Kumar, Advocate, Shri R.R.Swain, Advocate, Shri Prabhat Kumar Rai, Advocate, Shri I. Acharya, Advocate & Shri S.P. Panda, Advocate
6	22/25/2017/RC-I	M/s S.N.Mohanty	Shri Sanjit Mohanty Sr. Advocate, Shri Naveen Kumar, Advocate, Shri R.R.Swain, Advocate, Shri Prabhat Kumar Rai, Advocate, Shri I. Acharya, Advocate & Shri S.P. Panda, Advocate
7	22/26/2017/RC-I	M/s Patnaik Minerals Pvt. Ltd.	Shri Naveen Kumar, Advocate & Shri Prabhat Kumar Rai, Advocate
8	22/27/2017/RC-I	M/s D.R.Patnaik	Shri Ashok Kumar Parija, Sr. Advocate, Shri R.M.Patnaik, Advocate, Shri Dhananjaya Mishra, Advocate, Shri Arnav Dash, Advocate & Shri Avnish Kumar Sharma, Advocate
9	22/28/2017/RC-I	M/s Khatau Narbheram & Co.	Shri Ashok Kumar Parija, Sr. Advocate, Shri R.M.Patnaik, Advocate, Shri Dhananjaya Mishra, Advocate, Shri Arnav

			Dash, Advocate & Shri Avnish Kumar Sharma, Advocate
10	22/29/2017/RC-I	Shri Kshirod Chandra Pradhan	Shri Sidharth Pradhan (authorized representative)
11	22/30/2017/RC-I	Shri Kshirod Chandra Pradhan	Shri Sidharth Pradhan (authorized representative)
12	22/31/2017/RC-I	Shri Kshirod Chandra Pradhan	Shri Sidharth Pradhan (authorized representative)
13	22/32/2017/RC-I	Shri Kshirod Chandra Pradhan	Shri Sidharth Pradhan (authorized representative)
14	22/33/2017/RC-I	Shri Kshirod Chandra Pradhan	Shri Sidharth Pradhan (authorized representative)
15	22/34/2017/RC-I	Shri Kshirod Chandra Pradhan	Shri Sidharth Pradhan (authorized representative)
16	22/35/2017/RC-I	Smt. Mala Roy & Others	Shri Sanjit Mohanty, Sr. Advocate, Shri Naveen Kumar, Advocate, Shri R.R.Swain, Advocate, Shri Aishwarya Kaushiq, Advocate, Ms. Anubha Singh, Advocate & Shri Prabhat Kumar Rai, Advocate
17	22/36/2017/RC-I	M/s Penguin Trading & Agencies Ltd.	Shri Naveen Kumar, Advocate, Shri S.P.Panda, Advocate & Shri Prabhat Kumar Rai, Advocate
18	22/37/2017/RC-I	M/s Gandhamardan Spong Iron(P) Ltd	Shri Sanjit Mohanty, Sr. Advocate, Shri Naveen Kumar, Advocate, Shri R.R.Swain, Advocate & Shri Prabhat Kumar Rai, Advocate
19	22/38/2017/RC-I	M/s H.G.Panda & ors.	Shri Naveen Kumar, Advocate & Shri Prabhat Kumar Rai, Advocate
20	22/45/2017/RC-I	M/s Odisha Mining Corporation Ltd.	Shri Sanjit Mohanty Sr. Advocate, Shri R. K. Mehta, Advocate, Shri R.Swain, Advocate, Shri I.Acharya, Advocate, Ms. Himanshi Andley, Advocate & Shri S.R. Patnaik, Advisor (legal)
21	22/46/2017/RC-I	M/s Odisha Mining Corporation Ltd.	Shri Sanjit Mohanty Sr. Advocate, Shri R. K. Mehta, Advocate, Shri R.Swain, Advocate, Shri I.Acharya, Advocate, Ms. Himanshi Andley, Advocate & Shri S.R. Patnaik, Advisor (legal)
22	22/47/2017/RC-I	M/s Odisha Mining Corporation Ltd.	Shri Sanjit Mohanty Sr. Advocate, Shri R. K. Mehta, Advocate, Shri R.Swain, Advocate, Shri I.Acharya,

			Advocate, Ms. Himanshi Andley, Advocate & Shri S.R. Patnaik, Advisor (legal)
23	22/48/2017/RC-I	M/s Odisha Mining Corporation Ltd.	Shri Sanjit Mohanty Sr. Advocate, Shri R. K. Mehta, Advocate, Shri R.Swain, Advocate, Shri I.Acharya, Advocate, Ms. Himanshi Andley, Advocate & Shri S.R. Patnaik, Advisor (legal)
24	22/49/2017/RC-I	M/s Odisha Mining Corporation Ltd.	Shri Sanjit Mohanty Sr. Advocate, Shri R. K. Mehta, Advocate, Shri R.Swain, Advocate, Shri I.Acharya, Advocate, Ms. Himanshi Andley, Advocate & Shri S.R. Patnaik, Advisor (legal)
25	22/50/2017/RC-I	M/s Odisha Mining Corporation Ltd.	Shri Sanjit Mohanty Sr. Advocate, Shri R. K. Mehta, Advocate, Shri R.Swain, Advocate, Shri I.Acharya, Advocate, Ms. Himanshi Andley, Advocate & Shri S.R. Patnaik, Advisor (legal)
26	22/51/2017/RC-I	M/s Odisha Mining Corporation Ltd.	Shri Sanjit Mohanty Sr. Advocate, Shri R. K. Mehta, Advocate, Shri R.Swain, Advocate, Shri I.Acharya, Advocate, Ms. Himanshi Andley, Advocate & Shri S.R. Patnaik, Advisor (legal)
27	22/52/2017/RC-I	M/s Odisha Mining Corporation Ltd.	Shri Sanjit Mohanty Sr. Advocate, Shri R. K. Mehta, Advocate, Shri R.Swain, Advocate, Shri I.Acharya, Advocate, Ms. Himanshi Andley, Advocate & Shri S.R. Patnaik, Advisor (legal)
28	22/53/2017/RC-I	M/s Rungta Sons Pvt. Ltd.	Shri Naveen Kumar, Advocate & Shri Prabhat Kumar Rai, Advocate
29	22/54/2017/RC-I	M/s Rungta Sons Pvt. Ltd.	Shri Naveen Kumar, Advocate & Shri Prabhat Kumar Rai, Advocate
30	22/55/2017/RC-I	M/s Mangilall Rungta	Shri Naveen Kumar, Advocate & Shri Prabhat Kumar Rai, Advocate
31	22/58/2017/RC-I	M/s Tata Steel Limited	Shri Ashok Parija, Sr. Advocate, Shri Gopal Jain, Sr. Advocate, Shri Naveen Kumar, Advocate,

			Shri Amar Dave, Advocate, Ms. Nandini Gore, Advocate, Ms. Sonia Nigam, Advocate, Shri Abhinay Sharma, Advocate, Ms. Neha Khandelwal, Advocate & Shri Jasvir Singh, Advocate
32	22/59/2017/RC-I	M/s Tata Steel Limited	Shri Ashok Parija, Sr. Advocate, Shri Gopal Jain, Sr. Advocate, Shri Naveen Kumar, Advocate, Shri Amar Dave, Advocate, Ms. Nandini Gore, Advocate, Ms. Sonia Nigam, Advocate, Shri Abhinay Sharma, Advocate, Ms. Neha Khandelwal, Advocate & Shri Jasvir Singh, Advocate
33	22/60/2017/RC-I	M/s Tata Steel Limited	Shri Ashok Parija, Sr. Advocate, Shri Gopal Jain, Sr. Advocate, Shri Naveen Kumar, Advocate, Shri Amar Dave, Advocate, Ms. Nandini Gore, Advocate, Ms. Sonia Nigam, Advocate, Shri Abhinay Sharma, Advocate, Ms. Neha Khandelwal, Advocate & Shri Jasvir Singh, Advocate
34	22/61/2017/RC-I	M/s Tata Steel Limited	Shri Ashok Parija, Sr. Advocate, Shri Gopal Jain, Sr. Advocate, Shri Naveen Kumar, Advocate, Shri Amar Dave, Advocate, Ms. Nandini Gore, Advocate, Ms. Sonia Nigam, Advocate, Shri Abhinay Sharma, Advocate, Ms. Neha Khandelwal, Advocate & Shri Jasvir Singh, Advocate
35	22/62/2017/RC-I	M/s Tata Steel Limited	Shri Ashok Parija, Sr. Advocate, Shri Gopal Jain, Sr. Advocate, Shri Naveen Kumar, Advocate, Shri Amar Dave, Advocate, Ms. Nandini Gore, Advocate, Ms. Sonia Nigam, Advocate, Shri Abhinay Sharma, Advocate, Ms. Neha Khandelwal, Advocate & Shri Jasvir Singh, Advocate
36	22/63/2017/RC-I	M/s Tata Steel Limited	Shri Ashok Parija, Sr. Advocate, Shri Gopal Jain, Sr. Advocate, Shri Naveen Kumar, Advocate, Shri Amar Dave, Advocate, Ms. Nandini Gore, Advocate, Ms. Sonia Nigam, Advocate, Shri Abhinay Sharma, Advocate, Ms. Neha Khandelwal, Advocate &

			Shri Jasvir Singh, Advocate
37	22/64/2017/RC-I	M/s Tata Steel Limited	Shri Ashok Parija, Sr. Advocate, Shri Gopal Jain, Sr. Advocate, Shri Naveen Kumar, Advocate, Shri Amar Dave, Advocate, Ms. Nandini Gore, Advocate, Ms. Sonia Nigam, Advocate, Shri Abhinay Sharma, Advocate, Ms. Neha Khandelwal, Advocate & Shri Jasvir Singh, Advocate
38	22/65/2017/RC-I	M/s Essel Mining & Industries Ltd.	Shri Sanjit Mohanty, Sr. Advocate, Shri Naveen Kumar, Advocate, Shri R.R.Swain, Advocate & Shri Prabhat Kumar Rai, Advocate
39	22/66/2017/RC-I	M/s Essel Mining & Industries Ltd.	Shri Sanjit Mohanty, Sr. Advocate, Shri Naveen Kumar, Advocate, Shri R.R.Swain, Advocate & Shri Prabhat Kumar Rai, Advocate
40	22/67/2017/RC-I	M/s Essel Mining & Industries Ltd.	Shri Sanjit Mohanty, Sr. Advocate, Shri Naveen Kumar, Advocate, Shri R.R.Swain, Advocate & Shri Prabhat Kumar Rai, Advocate
41	22/68/2017/RC-I	M/s Aryan Mining & Trading Corporation Pvt. Ltd.	Shri Naveen Kumar, Advocate & Shri Prabhat Kumar Rai, Advocate
42	22/69/2017/RC-I	M/s Kalinga Mining Corporation	Shri Naveen Kumar, Advocate, Shri Prabhat Kumar Rai, Advocate & Shri Ashok Mohanty (Partner)
43	22/71/2017/RC-I	Shri Satyajit Pradhan	Shri Naveen Kumar, Advocate & Shri Prabhat Kumar Rai, Advocate
44	22/72/2017/RC-I	Shri Sunandan Pradhan	Shri Naveen Kumar, Advocate & Shri Prabhat Kumar Rai, Advocate
45	22/73/2017/RC-I	Sri Pawan Kumar Ahluwalia	Shri Manas Mohapatra, Sr. Advocate, Shri L.Mohapatra, Advocate, Shri Shrey Kapoor, Advocate & Shri Prabhat Kumar Rai, Advocate
46	22/74/2017/RC-I	Sri Kamaljeet Singh Ahluwalia	Shri Manas Mohapatra, Sr. Advocate, Shri L.Mohapatra, Advocate, Shri Shrey Kapoor, Advocate & Shri Prabhat Kumar Rai, Advocate
47	22/75/2017/RC-I	M/s Kaypee Enterprises	Shri Manas Mohapatra, Sr. Advocate, Shri L.Mohapatra,

			Advocate, Shri Shrey Kapoor, Advocate & Shri Prabhat Kumar Rai, Advocate
48	22/76/2017/RC-I	Sri Kamaljeet Singh Ahluwalia	Shri Manas Mohapatra, Sr. Advocate, Shri L.Mohapatra, Advocate, Shri Shrey Kapoor, Advocate & Shri Prabhat Kumar Rai, Advocate
49	22/77/2017/RC-I	Shri C.P.Sharma	None
50	22/78/2017/RC-I	M/s Kanakdhara Mining & Minerals Pvt. Ltd.	None
51	22/79/2017/RC-I	M/s Lal Traders & Agencies (P) Ltd.	Shri Ashok Kumar Parija, Sr. Advocate, Shri R.M.Patnaik, Advocate, Shri Dhananjaya Mishra, Advocate, Shri Arnav Dash, Advocate & Shri Avnish K. Sharma, Advocate
52	22/80/2017/RC-I	M/s Ghanashyam Mishra & Sons(P) Ltd.	Shri Ashok Kumar Parija, Sr. Advocate, Shri R.M.Patnaik, Advocate, Shri Dhananjaya Mishra, Advocate, Shri Arnav Dash, Advocate & Shri Avnish K. Sharma, Advocate
53	22/81/2017/RC-I	M/s Kalinga Mining Corporation.	Shri Naveen Kumar, Advocate, Shri Prabhat Kumar Rai, Advocate & Shri Ashok Mohanty (Partner)
54	22/82/2017/RC-I	M/s Mideast Integrated Steel Ltd.	Shri Naveen Kumar, Advocate, Shri Prabhat Kumar Rai, Advocate & Shri R.R. Swain, Advocate

Annexure - 6

OCCUPATIONAL HEALTH SURVILLANCE STUDY

NARAYANPOSHI IRON & MN MINES

M/s. ARYAN MINING & TRADING CORPORATION LTD.

Koira, Sundergarh, Odisha

www.aryanmining.in

[This is the extract report of the Final EIA/EMP report which is mentioned in the Sec. 3.2 of Chapter 3, Sec. 4.9 of Chapter 4, Sec. 6.2.2 of Chapter 6, Sec. 9.4 of Chapter 9 & Sec. 10.4.9 of Chapter 10, Page no. A-257 of Annexures and also the extract of the additional study carried on Occupational Health Study by M/s UECC Pvt. Ltd, Bhubaneswar, Odisha]

1. Introduction:

Occupational health is an area concerned with health and welfare of the people engaged in every occupation irrespective of sex, religion, region, age etc. It is the prevention and maintenance of physical, mental and social well- being of workers in all occupations. Prevention among workers in their employment from risks resulting from the factors adverse to health and Placing and maintenance of the workers in an occupational environment adapted to his physical psychological equipment.

Therefore, certain laws, regulations, and provisions were made by the government of India time to time in order to promote OHS at work place and safeguard worker's health as well as worker's interest. These regulations were also amended time to time by the government as per the requirement of worker's benefit.

The company is complying all the rules & regulations and practicing best of its occupational health and safety management system with adoption of the international management system i.e. BS OHSAS 18001:2007. The company formulated the ISO policy and manual based on the international guidelines.

The Management System has been developed to accomplish the objectives set out in the Health and Safety Policies and compliance to OHSAS 18001:2007. It is oriented towards the provision and maintenance of a healthy, safe and sustainable work environment and satisfaction of the stake holders, in accordance with legislation, provision of adequate training to ensure competent staff and pro-actively reducing the risk of accidents or environmental issues.

The project also follows and certified with different international standards w.r.t. Occupational Health & Safety Management System – BS OHSAS 18001:2007, Quality Management System – ISO 9001:2015 and Environment Management System – ISO 14001:2015 standards.

ARYAN

OHSAS POLICY

We, at Aryan Mining & Trading Corporation Pvt. Ltd. are committed to achieve a hazard & accident free work place through :

✓Identifying hazards & risks associated with the Activities.

✓Periodical reviews to prevent injuries & protect the people from occupational ill Health ensuring Total Safety

✓Taking suitable measures to continually improve our OHSAS performance

✓Complying fully with all relevant legislations including needs of OHSAS & making the policy available to all Stakeholders

✓Improving competence through regular training, communication, evaluation and accountability

✓Reviewing our OHSAS policy periodically to ensure relevance and suitability

2nd March 2018

Rev. 2.0

(CFO & Company Secretary)

TCCPL

Certificate of Registration

This is to certify that

Aryan Mining & Trading Corporation Pvt. Ltd.
(Narayanposhi Iron & Manganese Ore Mines)
At/P.O. - Koira, Distt. - Sundargarh - 770048, Odisha, India

has been assessed and registered by TCCPL as conforming to the requirements of:

OHSAS 18001:2007
[Occupational Health & Safety Management System]

The Occupational Health & Safety Management System is applicable to:

Operation, Trading & Export of Iron & Manganese Ore Resulting from Mining Activities

Certificate No: OH-912303341 | Certificate issue date: 23-03-2018 | Certificate valid till: 22-03-2019

Managing Director

Accredited by **United Accreditation Foundation (UAF)** Full Member of IAF
3510, Colmar, Norfolk, VA 23509, United States of America (USA)
To check certification status: http://uafaccreditation.org

Trans Continental Certifications Pvt. Ltd.
www.tccplcertifications.com
To check certification status: http://uafaccreditation.org, www.tccplcertifications.com or write us at info@tccplcertifications.com
Certificate is the Property of TCCPL and shall be returned immediately when demanded
Lack of fulfilment of conditions set out for the issuance of this certificate and timely completion of periodic surveillance audit may render this certificate invalid

2. System of Detection of Occupational Diseases in Mines

In order to detect occupational diseases, the industry is conducting medical examinations and health surveillance of workers as per the provisions of Mines Act. The present efforts of mines management are concentrated on detection of silicosis and other notified diseases. The essential features of health surveillance programme are as follows;

(a) Initial Medical Examination of persons to be employed in mines.

(b) Periodic Medical Examination once every five years. General physical examination, chest radiographs, lung function tests and audiometry.
(c) Classification of chest radiographs of workers as per ILO Classification.
(d) Medical examination within one year of superannuation.
(e) Evaluation of all cases of suspected pneumoconiosis by Pneumoconiosis Medical Board.
(f) Maintenance of medical records till the person is in service and 10 years thereafter.

The cases of silicosis if any detected during health surveillance programme will be referred to Pneumoconiosis Medical Board of the mining companies for evaluation and certification. If certified, the case is notified to the enforcement authority and evaluated for disability and payment of compensation.

3. Occupational Health Hazard Identification

An occupational hazard are defined as any condition that may adversely affect the well-being or health of exposed persons. Recognition of hazards in any occupational activity involves characterization of the workplace by identifying hazardous agents and groups of workers potentially exposed to these hazards. The hazards might be of chemical, biological or physical origin.

3.1. Identification and Classification of Hazards

Occupational health investigation is to identify possible hazards, to evaluate existing risks at the workplace, to prove compliance with regulatory requirements, to evaluate control measures or to assess exposure with regard to an epidemiological survey. This article is restricted to programmes aimed at identification and classification of hazards at the workplace. Many models or techniques have been developed to identify and evaluate hazards in the working environment. They differ in complexity, from simple checklists, preliminary industrial hygiene surveys, job-exposure matrices and hazard and operability studies to job exposure profiles and work surveillance programmes.

Identification and classification of hazards can be divided into three basic elements: workplace characterization, exposure pattern and hazard evaluation. The elements of risks are shown Figure 4.1.

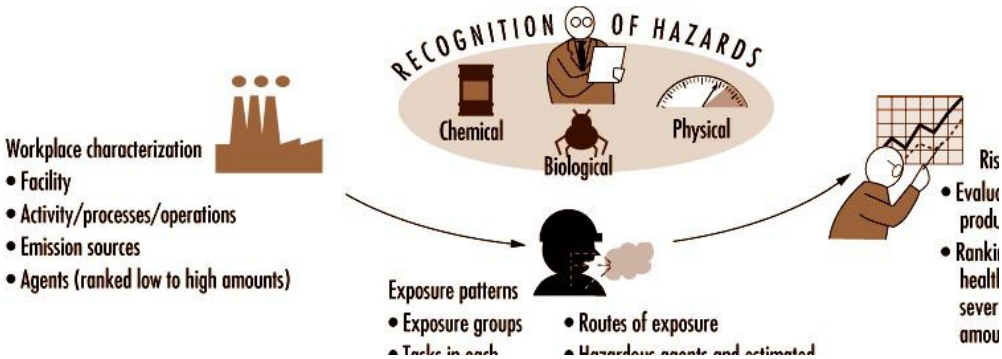


Figure 1 Elements of Risk Assessment

3.2. Workplace characterization

A workplace have different activities e.g., Mining, transportation, crushing, screening loading unloading, office buildings and emissions to the external environment and waste materials. At workplace different activities has localized to special areas such as departments or sections.

Facility locations, operations, emission sources and agents have grouped together in a systematic way to form recognizable units in the further analysis of potential exposure. In each unit, operations and agents should be grouped according to health effects of the agents and estimation of emitted amounts to the work environment.

3.3. Exposure patterns

The main exposure routes for chemical and biological agents are inhalation and dermal uptake or incidentally by ingestion. The exposure pattern depends on frequency of contact with the hazards, intensity of exposure and time of exposure. Working tasks have to be systematically examined. It is important not only to study work manuals but to look at what actually happens at the workplace. Workers might be directly exposed as a result of actually performing tasks, or be indirectly exposed because they are located in the same general area or location as the source of exposure. It might be necessary to start by focusing on working tasks with high potential to cause harm even if the exposure is of short duration. Non-routine and intermittent operations (e.g., maintenance, cleaning and changes in production cycles) have to be considered. Working tasks and situations might also vary throughout the year.

Within the same job title exposure or uptake might differ because some workers wear protective equipment and others do not. In large area, recognition of hazards or a qualitative hazard evaluation very seldom can be performed for every single worker. Therefore, workers with similar working tasks have to be classified in the same exposure group. Differences in working tasks, work techniques and work time will result in considerably different exposure and have to be considered.

Work processes, agents applied for that process/job or different tasks within a job title might be used, instead of the job title, to characterize groups with similar exposure. Within the groups, workers potentially exposed must be identified and classified according to hazardous agents, routes of exposure, health effects of the agents, frequency of contact with the hazards, intensity and time of exposure. Different exposure groups should be ranked according to hazardous agents and estimated exposure in order to determine workers at greatest risk.

3.4. Qualitative hazard evaluation

Possible health effects of chemical, biological and physical agents present at the workplace is based on an evaluation of available epidemiological, toxicological, clinical and environmental research.

Monitored data and records of measurements have studied. Within and between different exposure groups, workers should be ranked according to health effects of agents present and estimated exposure (e.g., from slight health effects and low exposure to severe health effects and estimated high exposure). Those with the highest ranks deserve highest priority. Before any prevention activities start it might be necessary to perform an exposure monitoring programme. All results have documented and easily attainable.

3.5. Occupational hazard associated with mining operation

3.5.1. Dust related diseases

The dust related diseases, mainly mine worker's silicosis, still remain the most important occupational lung diseases in mine workers.

Silicosis is caused by inhalation of dust that contains free crystalline silica. The mechanism of formation of silicosis has been known for hundreds of years.

Despite all efforts to prevent silicosis, it still afflicts workers in hazardous occupations in mining and quarrying. With its potential to cause progressive and permanent physical disability, silicosis continues to be one of the most important occupational diseases.

Recent research has found that silicosis is closely associated with tuberculosis and, together, silica dust, silicosis and Human Immunodeficiency Virus (HIV) have a multiplicative effect on the development of tuberculosis.

3.5.2. Manganese

Manganese plays an important role in a number of physiologic processes as a constituent of some enzymes and an activator of other enzymes. Manganese is a mineral and is nutritionally essential and potentially toxic to any living system. It functions as antioxidant. It helps in metabolism, bone development and wound healing. Low levels of manganese in blood are associated with osteoporosis, diabetes mellitus and epilepsy. The human body (adult) contains approximately ten to eleven milligrams (10-11mg) of manganese, most of which is found in the liver, bones, and kidneys. This trace element is a cofactor for a number of important enzymes and is actually required for various enzymatic reactions.

On the contrary, the excess manganese interferes with the absorption of dietary iron. Long-term exposure to excess levels may result in iron-deficiency anemia, chronic liver disease, metal fume fever, chemical pneumonia and Manganism. Thus Manganism classify as a Parkinson's syndrome.

Inhalation of dust is the major route of entry of Manganese to human beings. Inhaled particles are ingested after mucociliary clearance from the lungs. Prolonged inhalation may cause massive burns of the digestive tract, upper respiratory tract, lungs, central nervous system and circulatory collapse. Manganese in air and water has potentiality to cause serious and acute occupational health hazards.

The permissible exposure limit as per current OSHA standard is 5mg/m3 of air.

3.5.3. Iron

Iron ore consists mainly of iron oxides (magnetite (Fe_3O_4) and hematite (Fe_2O_3), the impurities present in it are : quartz, alumina, lime, magnesium, phosphorous, sulphur, sodium, calcium, titanium, vanadium, tin, cadmium etc. some of these substances are reddish brown solids with physical properties of incombustibility and insolubility in water which when inhaled results in different types of health problems. Exposure to iron ore dust particulates can cause metal fume fever in which the patient suffers with flu like illness. Metallic taste, fever and chills, chest tightness and cough are the symptoms of it. Prolonged and repeated contact may discolor the eyes causing permanent iron staining. Repeated exposure might cause changes which can be seen on chest X-ray. Silica being one of the major constituent of iron ore dust might cause silicosis and other related lung diseases such as irritation and lung cancer. Siderosis is caused due to iron ore dust inhaling which does not cause any symptoms but abnormality could be seen on X-ray. Pulmonary Siderosis is one kind of pneumoconiosis caused by the long term exposure (inhalation) of iron ore dust particulates.

According to OSHA the permissible exposure limit is 10 mg/m3 averaged over an 8- hour wok shift and 5 mg/m3 averaged over a 10- hour work shift as per NIOSH.

3.5.4. Noise

Hearing defects may be causes due to exposure to excess noise (above 90dB) during work in the long run in mining operations such as drilling, crushing, screening, blasting, etc.

- The disease is called Noise Induced Hearing Loss (NIHL) which does not affect the normal speech range initially. It affects the high frequency (above 4000 Hertz) at first and shifts to the speech frequency gradually.
- The person gradually becomes deaf; irritable, talks in a loud voice, develop sleeplessness and high blood pressure.
- The hearing impairment can be detected early by audiometric test.
- Hearing conservation program should be adopted in every mine in noisy areas to reduce noise hazard.

This program consists of noise measurement at the work place, control of noise level in the source, on the pathway and at the miner's ear level, use of ear protection (ear plugs and ear muff), periodic ear examination and audiometer, educating employees about noise hazard and job rotation to minimise exposure.

Below listed several factors that influence occupational hearing loss. These factors include the following;

1. Age of employee;
2. Pre-employment hearing impairment;
3. Diseases of the ear;
4. Sound pressure level of the noise;
5. Length of daily exposure;
6. Duration of employment;
7. Ambient conditions of the workplace;
8. Employee lifestyle outside the workplace.

3.5.5. Vibration hazards

Introduction of heavy earth moving machines has increased the hazards of whole body vibrations among operators.

Long term exposure to whole body vibrations is known to cause backache and other degenerative spinal disorders, joint, tendon or muscle inflammation or irritation, backache, etc.
HEMMs, Dozers, Loaders, Dumpers & Tippers, Excavators, and Shovels showed moderate to high health risks to operators due to whole body vibrations.

3.5.6. Poor Illumination

Poor illumination produces eyestrain and abnormal movement of the eyeball (nystagmus) among the mines, sometimes poor illumination causes accidents.

Therefore, it is necessary to keep the work area well lighted without shadows or glare. The miners should also wear goggles to protect their eyes.
Lighting standards at various work places are specified by DGMS, Dhanbad.

3.5.7. Ergonomic Hazards (Equation of Man & Machine-due to pose, posture while Working)

Hot humid work environment and mechanical problems during work lead to health impairment.

Most of the mines in our country uses various equipment, which are not designed for Indian workers. As a result, most of the miners, who have poor health condition, suffer from fatigue, back pain, and joint pain and work stress.
In addition to this, poor illumination, lack of ventilation. Hot and humid work environment and mechanical problems during work lead to health impairment.
Musculoskeletal disorders; Musculoskeletal disorders of mine workers such as backache, joint pains, cervical spondylitis, etc. probably contribute to high morbidity and absenteeism. Difficult and ergonomically unsuitable postures and tools in mining are probably responsible for majority of the musculoskeletal disorders.

To prevent this, proper workstation design, selection of health workers to operate heavy equipment, rest pause and periodic medical examination to assess fitness for the job are some of the important steps to reduce this hazard.

3.5.8. Psychosocial hazards

Drug and alcohol abuse has been a difficult issue to deal with in mining, but policies and procedures are now in place in most large mining operations.
Mining operations commonly require the measurement of urinary drug metabolites and breath or blood alcohol on pre-employment and following accidents.
Contemporary finds, however, tend to be smaller and do not justify establishment of permanent townships. As a result, there has been a trend

towards 'fly-in-fly-out' operations, with mine employees separated from their families and communities during work periods. Expatriate placements are also common in mining and the associated psychosocial hazards have been reviewed.

3.6. Occupations involving Risk of Occupational Diseases & their Diagnostic Methods

Diagnostic Methods or tests are necessary to detect the disease. They are general as well as specific. Before selecting such test it is always useful to know the occupation of the worker, chemicals and other physical, biological agents involved in the occupation, work environment, work methods, protective wears used or not used, personal habits, family history and other possible combined causes which may be contributory to the cause of the disease, illness or poisoning. Some general or common diagnostic methods are given Table1.

Table 1

Occupational Diseases Symptoms and Diagnosis

S.N	Diseases caused by	Occupational involved	Signs & Symptoms	Diagnosis / Indicator
Chemical Hazard (Metals ,Dust and chlorine) :				
1	Manganese	Mining and other allied activities	Chills, fever, headache, weakness, voice sinks, speech irregular, inability to run, cannot walk backwards	History, Mn in urine > 21μg/ / Faces > 60μg/ kg Hair > 4μg/ kg
1b	Iron	Mining and other allied activities	Metal fume fever (flu like illness. Metallic taste, fever and chills, chest tightness and cough),discolor the eyes causing permanent iron staining	Chest X-ray and periodic examination of eye.
2	**Dusts :**	Diseases of respiratory tract, caused by mineral dusts (silica) are called pneumoconiosis.		

2a	Silicosis	Mines and quarries,	Dyspnoea on exertion, cough, wheezing, chest illness, pulmonary TB or infection respiratory difficulty and death	Periodic radiological examination, egg-shell type calcification of lymph glands in 2-4% cases. Good chest X-ray with history. Should not be wrongly diagnosed as TB
3	**Gases, fumes, vapours etc. :**			
3a	Chlorine	Chlorination, bleaching process, water cleaning.	Irritation of eyes and skin, substernal pain, vomiting with headache, damage, fall of BP arrest	Electrocardiogram, sputumgram stain and culture, differential WBC count and arterial blood gas analysis

S.N	Diseases caused by	Occupational involved	Signs & Symptoms	Diagnosis / Indicator
4	Physical Hazards (Noise & Vibration)			
4a	Audiometric (Hearing loss)	High noise levels during HEMM operation, drilling, blasting, crushing and screening and compressor room.	Ringing in ear, difficulty in hearing (e.g. ticking clock), temporary and permanent. Occupational deafness	Audiometric examination and noise level measurement in work place.
4b	Non Audiometric	Mining loaders, fork-lift trucks, pneumatic tools, chain saws, hand drill, breaker 15-122 dB or more.	Circulatory, gastrointestinal, endocrine, respiratory, blood, pain in the ear. The skull, jaws, thoracic wall, and large muscles appear to vibrate and, if the noise continues for some time, fatigue, irritability, and a sense of	

			apprehension may follow.	
4c	Decompression sickness	Work in compressed air or with vibrating tools or equipment with 2000-3000 blows per min.	Dizziness, nausea, blood formation in ear drum, limb pain, skin effects, headache, coronary dysfunction, bone or joint pain, back pain.	Regular medical examination for respiratory and cardiovascular problems. Radiographs of shoulder, hip and knee joints.
5	**Bio-hazards :**			
	Diseases caused by biological agents	Contact with domestic, and other animals, hospitals, dairy and forestry.	Anthrax , dermatitis, inflammation, infection, jaundice, fever, upset stomach, muscular pain, headache, skin effect etc.	Redness or discoloration of skin, glandular tumour. In fungal infections swelling of fingers. herpes virus may cause meningitis.

4. Monitoring Planning, Methodology and Result Analysis

OHS is the most important aspect of overall opencast mining operation. Information on the existing health status is essential for assessing the likely impacts of the proposed project. The baseline data collections were conducted during March 2018 to June 2018 in summer season and are in concurrence with the TOR approved by the Ministry of Environment Forests and Climate Change (MoEF & CC).

4.1 Occupational Health components and methodology

The Occupational Health components studied and the methodologies followed for the preparation of this report is given in Table-2 and Table 3 shows the Methodology of Sampling & Analysis and Equipment used.

Table 2

Occupational Health Component Monitoring Plan

Sl No.	Attribute	Parameters	No. of Sampling Locations	Frequency of Monitoring / Data Collection
1.	Ambient air quality	- PM_{10}, $PM_{2.5}$, SO_2, NOx, CO & Pb -PM (chemical characteristics)	5 locations within 10 km of which 2 are in core zone and 03 in buffer zone.	24 hourly samples twice a week
2.	Meteorology	Wind speed, wind direction, temperature, relative humidity	1 Location	Data collected during the study period on hourly basis. Historical data also collected for IMD, for corroborating the data and planning the monitoring network.
3.	Drinking water	Physical, chemical and bacteriological parameters.	4 samples nearby mining area	Once during the study period.
4.	Noise levels	Noise levels in dB (A)	10 locations.	Hourly observation once during the season in industrial, commercial, residential and silence zones.
5.	Work zone Noise	Exposure level	10 locations	monthly once, shift wise observation in Mining area (HEMM, Drilling ,crushing, loading and unloading)
6.	Personal dust	Exposure level	8 samples Work zone area	Ceiling: 15 minute or less Short-term : < 2 hrs Full-shift : Work shift 8hrs
		Free Silica		Once during the study period
		Heavy metal Iron, and Mn.		
7.	Illumination	Intensity in Lux	Major operating	Monthly twice during the study period

Sl No.	Attribute	Parameters	No. of Sampling Locations	Frequency of Monitoring / Data Collection
			area	
8.	Vibration	Whole body vibration	4 location	Once during the study period (HEMM operator, hand driller , blasting area)

Table 3

Methodology of Sampling & Analysis and Equipment used

Sl. No.	Parameters	Instrument / Apparatus used	Method followed	Reference	Standard
1.	Respirable Particulate Matter (PM10)	Respirable Dust Sampler (RDS), Balance	Gravimetry	CPCB notification of 11-4-94	100
2.	Personal Respirable dust	Personal dust sampler, Balance	Gravimetry	NCB MRE 113A	3mg/m3
3.	Heavy Metal Iron, Mn, in PM10	RDS/HVAS, Atomic Absorption Spectrophotometer (AAS)	Gravimetric followed by AAS	ACGIH	0.2mg/m 3 for Mn.
4.	Free Silica	Personal dust sampler ,	FTIR (Fourier Transform Infra red)/ Gravimetric and spectrophometric/XRD	DGMS(Tech.)S &T Circular 01 2010	0.3mg/m 3/8hr or <5%
5	Noise work Zone	Sound level meter Dosimeter	Sound pressure level	DGMS circular No. 18 of 1975	85 db any exposure
6.	Illumination	Lux meter	Intensity of light	DGMS (Legis) Circular 03 2017	Attached
7.	Vibration	Transducer		DGMS (TECH)/ ST Circular-7 1997	Attached

MRE: Mine research Establish NCB

4.2 Result and analysis

4.2.1 Ambient and personal respirable dust

Ambient Air Quality monitoring was carried out as per CPCB guidelines in 05 Nos of locations; out of 05, 02 nos. are in core zone and 03 nos. in buffer zone of the mining lease area. The summary of AAQ report is given in the Annexure 1 and Table 4.

Table No. 4

Ambient Air Quality summary

	PM_{10}	$PM_{2.5}$	SO_2	NO_X
Total No. of location	5	5	5	5
Core Zone	2	2	2	2
Buffer Zone	3	3	3	3
No of samples per location	10	10	10	10
Total No of samples	50	50	50	50
No of sample within norm	50	50	50	50
% deviation	Nil	Nil	Nil	Nil

It is reveled from the analysis report that all the samples are within the AAQ norms of CPCB.

4.2.2 Work Zone dust Characteristic

Work zone dust, which include analysis of parameters of concern i.e. lead, silica & Fe, and crystalline silica, was conducted. Size distribution of respirable dust was also analyzed and found that 0 –5 µm and 5 – 10 µm were in the range of 20 – 45 % and 55 – 80 %, respectively. A general chemical analysis of dust in mining area is given in Annexure 1 & Table 5 and Work Zone dust monitoring is given in Table No. 6.

Table 5

Chemical Analysis of Work zone Dust

S.N	Parameter	Respirable dust	Coarse Dust
1	Lead as Pb	0 – 0.04 %	0 – 0.12 %
2.	Silica as SiO2	14 – 56 %	2 – 8 %
3.	Iron as Fe	0.28 – 3.3 %	4 – 4.4 %
4.	Crystalline	2%	traces

	silica(Free Silica)		
5.	Manganese as Mn	0 – 0.05 %	0 – 0.14 %

Table No. 6

Work Zone dust monitoring (in µg/m3)

Period: Oct'17 to March'18

Month/ Location	Oct '17	Nov'17	Dec'17	Jan'18	Feb'18	March'18
Excavation area	302	206	340	348	322	459
Screen, loading-unloading area	270	240	421	339	302	438
Haul road	271	222	381	409	371	407
Dump area	292	239	310	301	279	404

The report of crystalline silica in bulk samples are given in **Table 7.**

Table No. 7

Free silica percentage in bulk samples

S.N	Sampling Location	Free silica %
1	Excavation	15.6
2	Crusher	15.4
3	Road	15.2

Respirable dust near different mining machinery is given in **Table 8.**

Table 8

Respirable dust assessed with gravimetric dust sampler

S.N	Sampling Location	Level in mg/m3	Standard (in mg/m3)
1	Near dumper	0.91	3.0
2	Secondary crusher	0.81	3.0
3	Drill 1 mtr away	0.6	3.0
4	Shovel 1 mtr away	0.51	3.0
5	Dumper cabin	0.35	3.0
6	Loading point	0.62	3.0

It was revealed from the analysis report that the respirable dust at different mine section is well within the DGMS limit.

4.3 Noise Levels

4.3.1 Ambient Noise

In order to have an idea about the existing noise levels in the study area, noise monitoring has been carried out at 4 nos. of locations out of 04 locations 02 are in work zone area and 02 are in buffer zone area. Work zone as well as ambient noise. Monitoring results are given in Table 9. The detailed report is attached as Annexure # 1.

Table 9

Summary of Ambient Noise Survey

S. N	Location	Type of Area	Total no of day time observation	Total no of night time observation	% deviation
1	Near Mazagine	Core Zone	12	12	Nil
2	Near Boundary	Core Zone	12	12	Nil
3	Kishra	Buffer Zone	12	12	Nil
4	Koira	Buffer Zone	12	12	Nil

The ambient air quality norms in respect of noise are given in **Table 10.**

Table 10

Ambient Air Quality norms in respect of Noise

(As Per Schedule III, Rule 3 of Environment Protection Rules, 2000)

Type of Area	Day (0600 – 2200 hrs).	Night (2200 – 0600 hrs.)
Industrial Area	75	70
Commercial Area	65	55
Residential Area	55	45
Silence Zone	50	40

All Values in dB (A)

At all the noise monitoring stations values of Leq. are well within their respective norms.

4.3.2 Work Zone Noise

Dosimeters also give an equivalent sound or noise level. This is the average exposure level for noise over the time dosimeter was on. It has the same total sound energy as the actual, variable sound levels to which a person is exposed over the same time period. Scientific evidence suggests that hearing loss is affected by the total noise energy exposure. If a person is exposed over an eight-hour work shift to varying noise levels, it is possible to calculate an equivalent sound level which would equal the same total sound energy exposure. This would have the same effect on the person's hearing as the variable exposure actually received. Most of the machines do not operate constantly or at a constant noise level. Exposure to noise varies due to mobility of workers, mobility of noise sources, variations in noise levels or a combination of these factors. Noise measurements has include max. and min, SPLs produced in dB(A) in any survey & all noise levels less than 80 dB(A) has ignored. If the survey indicates that worker is exposed to noise >90 dB (A) then he is being provided with hearing protection. The noise level at different operations is given in the Table 11.

Table 11

Noise level at different Operation

S.N	Operation	SPL	Leq.
1	Dumpers		
	Empty run	93-99	96.3
	Loaded run	97-98	99.8
2	Shovels		
	Near Operator	90-96	92.7
	3m away	87-92	89.1
3	Drills		
	Near Operator	106-110	108.3
	3m away	87-93	92.4
4	Crushers		
	Primary	75-83	82.5
	Secondary	84-87	86.3
5	Screens		
	Primary	95-96	96.2
	Secondary	83-95	87.5

Spl - Mean Range, Leq- Level Equivalent, *All Values in dB (A)*

4.4 Illumination survey

Illumination survey was conducted to verify the intensity of light at different mining location. The survey report is given in Table 12.

Table 12

Summary Illumination Survey in the site

S.N	Location	Actual Lux		Appx. Dist. In Meter
		Horizontal	Vertical	
Path way /Road/General working area				
1	Near gate no-01 Entrance	15	6	20
2	Near gate no-01 Exist	13	10	20
3	Near 50 TPH W/B	11	17	20
4	200 mt from entrance gate-01 towards mines	9	12	15
5	200mt from exit gate-01 towards mines	12	19	15
6	Near Laboratory	14	13	25
7	Near central contractor camp	14	12	25
8	At start of RF road	18	7	20
9	At turning of RF road	20	11	15

10	Near 61 Dump	14	12	20
11	200mt away from 61 dump	16	15	25
12	Near portable weighbridge -01 (quarry -06)	27	13	10
13	Near portable weighbridge -02	17	14	10
14	Near portable weighbridge -03 (quarry -03)	8	14	30
15	300mt away from port. WB- 02	14	13	20
16	Near central despatch weighbridge	11	12	15
17	Near Orwin weighbridge	19	14	15
18	500mt away from 61 dump towards gate -03	21	16	25
19	500 mt away from port WB-02 towards gate-02	9	14	30
20	800 mt away from port WB-02 towards gate-02	7	11	30
21	QDS w/b Area	19	17	15
22	300mt away from despatch WB towards 650	24	17	20
23	Near QDS weighbridge	14	17	25
24	Near gate no- 02	17	16	15
25	Near gate no- 03	14	16	15
26	500 meter before gate no- 03 , beside quarry 6	17	12	15
Quarry/ Plant area/Work shop/Pump house				
1	Quarry -06 & quarry -03 chalk	16	12	15
2	Quarry -06 & quarry -04 chalk	18	16	10
3	Near RF quarry	17	15	15
4	Near Sandvik plant	23	19	20
5	At 50 TPH orwin Camp	19	18	20
Other area				
1	Near Sprinkler Pump	19	16	15
2	Near Vehicle Washing area	13	11	30

The illumination survey report has compared with the standard of DGMS and the findings are given in Table 13.

Table 13

Compared of Illumination Study with Standard

S.N	Illumination survey area.	Number of location	Standard	Deviation location No. from standard	% deviation
1	General working area	46	10	5	10
2	Road	23	15	8	33
3	Crushing Screening , Loading & unloading	11	40	3	27
4	Other places	22	20	2	9

4.5 Water analysis report

Surface and ground water analysis was carried out to ascertain the quality of water, which is available to employee/ workers for drinking purpose and other domestic use. The summary of analysis report is given in the following Table 14. The surface water and drinking water is compared with IS10500-2012.

Table 14

Water Quality Analysis report

(Unit mg/L except pH)

Location	pH	TSS	Total hardness	Lead	CD	Iron	Manganese
W1	6.82	38.5	32	0.006	0.0	0.13	0.14
W2	7.73	9.5	108	0.079	0.001	0.03	0.05
W3	7.57	4.1	120	0.094	0.001	0.0	0.04
W4	7.13	1.3	92	0.099	0.006	0.0	0.07

W1: Orahuri upstream W2: Orahuri downstream + Karo upstream

W3: Karo upstream and W4: Ground water Q-5 Mn.

It was revealed from the analysis report that the results are well within the norms.

4.6 Pre and Post Medical examination

Narayanposhi Iron and Manganese Ore mines has undertaken pre and post medical examination to ascertain any impact of mining operation on employee, workers and community and also for future reference. The medical examination is based on the occupational hazard identification arises during the period of direct or indirect employment. The detail medical examination is as follows;

- **Chemical Hazard (Metals (Fe and Mn), Dust and chlorine**
- **Physical Hazards (Noise & Vibration)**

4.6.1 Occupational Health Surveillance Programs i.e. periodical medical examinations

Conducting initial medical checkup followed by periodical medical examination as per DGMS specifications to all the entry level workers and following the remedial corrective measures.

- Conducting regular occupational health check-ups through medical team for prompt actions and cure, in case of any incidences of any occupational related diseases.
- Organizing medical camps for the nearby local community.
- Observation and compliance of all precautions, control measures and stipulations on above lines will help to ensure that no occupational health and hygiene problems arise due to the project operations in the area.
- Pre-employment Initial Medical Examination (IME) conducted to every employee.
- Periodic medical examination (PME) occupational health check up on staff/workers conducted based on the ages of employee.
    - **Once in every 5 years for employees below 45 years**
    - **Once in every 3 years for employees between 45 to 58 years**
    - **Once in a year for employees above 58 years**
    - **Vision test of every Drivers/Operators once in every year**
    - **Stool & sputum test of canteen workers once in every six months**
- Classification of chest radiographs of workers as per ILO Classification.
- Medical examination within one year of superannuation.

INITIAL / PERIODICAL MEDICAL EXAMINATION, STOOL TEST and EYE REFRACTION TEST

YEAR	IME		PME		EYE REFRACTION		STOOL & SPUTUM TEST	
	DEPT.	CONT.	DEPT.	CONT.	DEPT.	CONT.	DEPT.	CONT.
2016-17	-	42	-	38	-	20	-	5
2017-18	62	95	32	207	5	42	3	12

The following personnel are there in the Hi-Tech Diagnostic Centre to carry out the IME/PME of the employees with following technical/qualified medical staffs;

Occupational Health Team:

Occupational Health Physician	:	3 Persons
Consultant Pathologist	:	1 Person
Consultant Radiologist	:	1 Person
Physician/ Lady Doctor	:	1 Person
Public Relation Officer	:	2 Persons
Audiologist	:	1 Person
X-Ray Technician	:	2 Persons
Pathology Lab Technician	:	2 Persons
Computer Personnel	:	2 Persons
E.C.G. Technician	:	1 Person

Following tests are being conducted in the Hi-Tech Lab with modern sophisticated instruments as follows.

PATHOLOGY:

Fasting Blood sugar, PP Blood Sugar, Lipid Profile (Cholesterol, Triglyceride, HDL, LDL, and VLDL), Renal Profile (Urea, Creatinine), Total Blood (TWBC, TRBC, and Total Platelet Count), DC, Hb% and other specialized tests specified by recommendation of 10th conference on safety in were conducted during IME/PME.

The procedures are conducted by automated analyzer and other modern sophisticated equipment's and performed by 4 qualified and experienced lab technicians. Entire pathological procedures are conducted under the supervision of qualified and experienced pathology specialists.

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, FEVI and other parameters. And prior to PFT the information regarding height, weight, date of birth, history of habits, health conditions, occupation for all workers are entered into the computer.

After completion of the test, the workers with impaired Lung Function Tests are explained different breathing exercises, use of personal protective equipment and advised to stop Tobacco smoking for chronic smokers.

CARDIOVASCULAR ASSESSMENT:

Modern 12 lead ECG (Electrocardiogram) machine is being used to conduct the ECG of all 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, Heat, Lungs, Abdomen, Locomotors system etc. are being examined by qualified and experienced doctor as specified in the Mines Rule 1955 and 10th & 11th conference of Safety in Mines.

CHEST X-RAY:

300MA X-Ray machine is being used for effective radio imaging. Each worker is 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 ILO 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. It is the simple test in which hearing threshold are measured. Both the ears are masked by a headphone followed by pure tone sounds in different intensity and frequencies one by one. Besides this, a bone vibrator complies the threshold of inner ear and some quick tuning fork test completes & accurate the audiometry test.

EYE CHECK-UP:

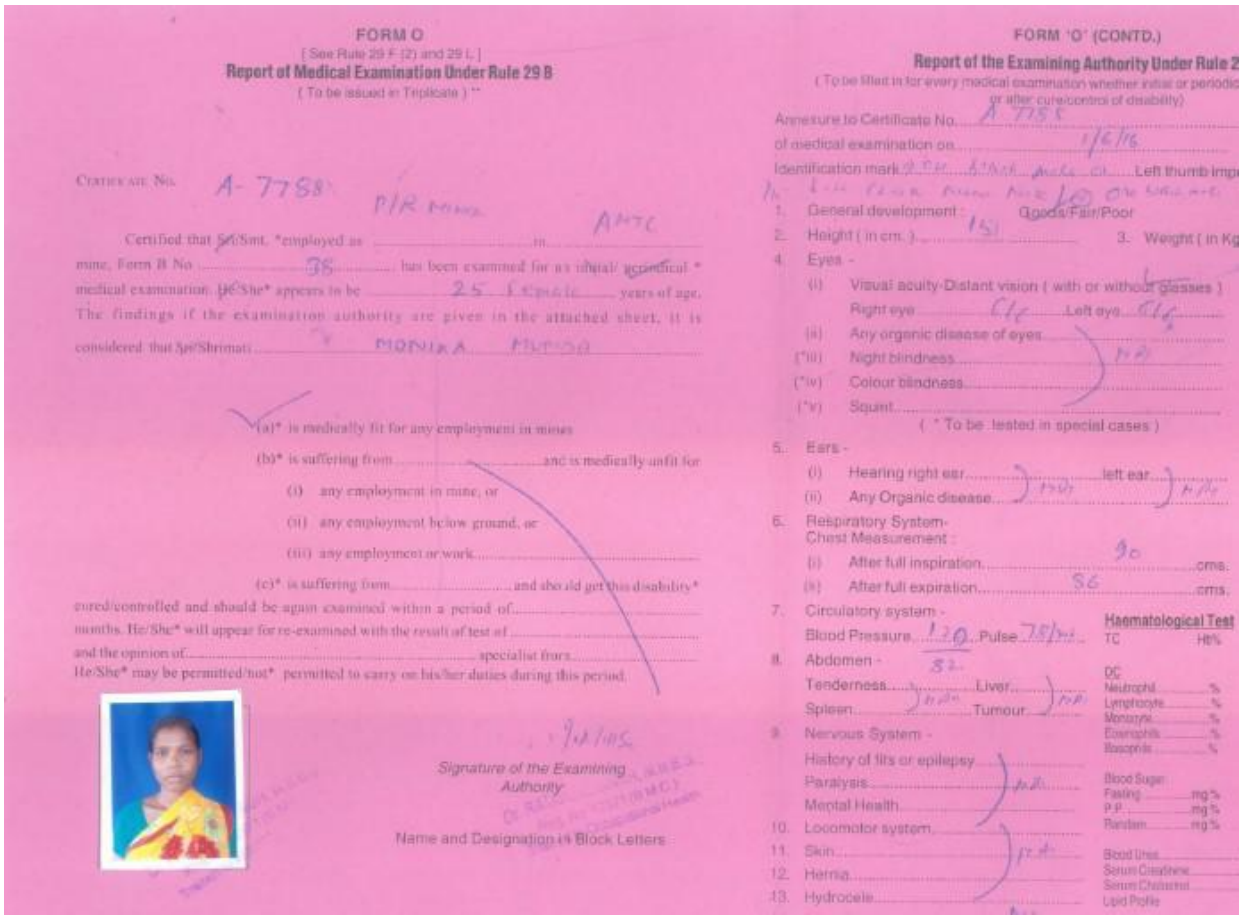
Special Eye tests for drivers, operators of HEMM and the eye problems detected during the medical examination camp are done by a qualified and experienced Eye Specialist with modern sophisticated equipment separately.

OCCUPATIONAL HEALTH PHYSICIAN

After completion of the entire tests, the employees present themselves before the Occupational Health Physician for final occupational health assessment. He examines all the systems including detailed

neurological assessment as recommended in 10th & 11th Conference on safety in Mines and final diagnosis & suggestions are entered into the predesigned format which is documented in the computerized data sheet in Form-O.

Form-O



FORM O

[See Rule 29 F (2) and 29 L]

Report of Medical Examination Under Rule 29 B

(To be issued in Triplicate) **

Certificate No. A-7758

Certified that Sri/Smt. *employed as ..... in ..... mine, Form B No. 38 has been examined for an initial/ periodical * medical examination. He/She* appears to be 25 years of age. The findings if the examination authority are given in the attached sheet, it is considered that Sri/Shrimati ..... MONIKA

(a)* is medically fit for any employment in mines

(b)* is suffering from ..... and is medically unfit for

(i) any employment in mine, or

(ii) any employment below ground, or

(iii) any employment or work .....

(c)* is suffering from ..... and should get this disability* cured/controlled and should be again examined within a period of ..... months. He/She* will appear for re-examined with the result of test of ..... and the opinion of ..... specialist from ..... He/She* may be permitted/not* permitted to carry on his/her duties during this period.

Signature of the Examining Authority

Name and Designation in Block Letters

FORM 'O' (CONTD.)

Report of the Examining Authority Under Rule 2

(To be filled in for every medical examination whether initial or periodic or after cure/control of disability)

Annexure to Certificate No. A-7758

of medical examination on 1/6/16

Identification mark ..... Left thumb impr

1. General development : Goods/Fair/Poor
2. Height (in cm.) 151 3. Weight (in Kg
4. Eyes -
   (i) Visual acuity-Distant vision (with or without glasses)
   Right eye CF Left eye CF
   (ii) Any organic disease of eyes .....
   (*iii) Night blindness .....
   (*iv) Colour blindness .....
   (*v) Squint .....
   (* To be tested in special cases)
5. Ears -
   (i) Hearing right ear ..... left ear .....
   (ii) Any Organic disease .....
6. Respiratory System-
   Chest Measurement :
   (i) After full inspiration 90 cms.
   (ii) After full expiration 86 cms.
7. Circulatory system -
   Blood Pressure 120 Pulse 78/m
8. Abdomen - 52
   Tenderness ..... Liver .....
   Spleen ..... Tumour .....
9. Nervous System -
   History of fits or epilepsy .....
   Paralysis .....
   Mental Health .....
10. Locomotor system .....
11. Skin .....
12. Hernia .....
13. Hydrocele .....

Haematological Test

TC Hb%

DC

Neutrophil %

Lymphocyte %

Monocyte %

Eosinophils %

Basophils %

Blood Sugar

Fasting mg%

P.P. mg%

Random mg%

Blood Urea

Serum Creatinine

Serum Cholesterol

Lipid Profile

4.7. Essential Public Health Services Proposed:

- Monitor health status to identify and solve community health problems.
- Diagnose and investigate health problems and health hazards in the community.
- Inform, educate and empower people about health issues.
- Mobilize community partnerships to identify and solve health problems.
- Develop policies and plans that support individual and community health efforts.
- Enforce laws and regulations that protect health and ensure safety.
- Link people to needed personal health services and assure the provision of health care when otherwise unavailable.
- Assure a competent public and personal healthcare workforce.
- Evaluate effectiveness, accessibility, and quality of personal and population-based health services.
- Research for new insights and innovative solutions to health problems.
- Facilities for Occupational Health Surveillance:
- The project has developed one full time dispensary at its colony and another within the mine site; managed by qualified personnel.
- Project carries regular medical health camps and follows the findings of different cases of diseases and makes the reference to the Super-specialty hospitals for diagnosis and observations.

HI-TECH MEDICAL COLLEGE & HOSPITAL

(Under Vigyan Bharati Charitable Trust)

Health Park, Near R.G.H. Campus, Rourkela-769004

Phone : 0661-2400751, Fax : 0661-2400524

www.hi-techmedicalrkl.org

OPD REGISTRATION CARD

OPD Sl. No

201808100009

REGD. NO.	: 201808100009	REGD. DATE	: 10/08/2018
DEPARTMENT	: NEURO SURGERY	PATIENT NAME	: TULSI NAIK
PATIENT TYPE	: REG.WALK-IN/GENERAL	AGE/GENDER	: 51 YEAR / FEMALE
		ADDRESS	: PS-KOIDA,AT-KOIDA,SNG ORISSA,INDIA,
REGD. FEES	: 30.00		

WEIGHT : ______

BP : 90/70 mm Hg

PULSE : 70/min

Examined on 10/08/2018

c/o Fever - 3Dys
Headache - 3Dys Cdurng f
Weakness, Gets relieved

O/E

Conscious
Higher fn - normal
Cr. Nn - NAD
No motor / sensory d
Pulse = 70/min
BP = 90/70 mm Hg.

Δ Clinically no neurological d

Adv
Dc, TLC, Hb, MP
FBS, U, Cr,

Hi-Tech Medical College & Hospital-RKL

Refd. to Med OPD

HITECH MEDICAL COLLEGE
AND HOSPITAL
(UTKER VIGYAN BHARATI CHARITABLE TRUST)
Hanuman Vatika, Near RGH Campus,
Rourkela - 769 004

Phone: (0661) - 240
Web : www.hi-tech

Branch : HTMC - Rourkela
Patient : Mrs TULSI NAIK 51Y/F
Referrer : Dr. R.N.MOHAPATRA
SID No. : 40052712 Patient No 4000039119

Ref No. : 201808100009

Age / Sex : 51
Collected Date & Time : 10/
Received Date & Time : 10/
Report Date & Time : 10/

Final Test Repo

INVESTIGATION/METHOD	SPECIMEN	RESULT	UNITS	REFERENCE
Biochemistry				
BLOOD GLUCOSE (F) GOD/POD	Plasma	107.0	mg/dL	70 - 110
UREA GLDH Method	Serum	21.0	mg/dL	13 - 45
CREATININE Jaffe's Kinetic	Serum	0.70	mg/dL	0.5 - 1.0
Hematology				
TOTAL WBC COUNT, Electrical Impedance	EDTA	8000	Cells / Cumm	4000 - 1100
DIFFERENTIAL COUNT				
Polymorphs Manual method – Leishman Staining		60.0	%	40 - 75
Lymphocytes Manual method – Leishman Staining		38.0	%	20 - 45
Eosinophils Manual method – Leishman Staining		2.0	%	1 - 4
Monocyte Manual method – Leishman Staining		0.0	%	2.0 - 10.0
Basophils Manual method – Leishman Staining		0.0	%	0.0 - 2.0
HAEMOGLOBIN Cell counter – cyanide free SLS method	EDTA	10.8	g/dL	12.0 - 16.0

5. Present Management Practices

Mining is a hazardous profession. Just like in any other industrial accident, unsafe act and unsafe conditions of work lead to accidents in mines. Most of the accidents are preventable – they do not just happen, they are caused. Other than loss of lives or serious injuries due to mining accidents, the aspect of occupational health hazards in mining industry is critical and going to assume serious proportion with the increasing awareness. Hence it is pertinent to review the safety and occupational health status of this mining to work out a road map for its effective mitigation.

Almost all occupational diseases are known to cause permanent disablement and there is no effective treatment. However, most of the occupational diseases can be prevented by adopting proper occupational health measures and engineering control on airborne dust at workplace as shown in Figure 2.

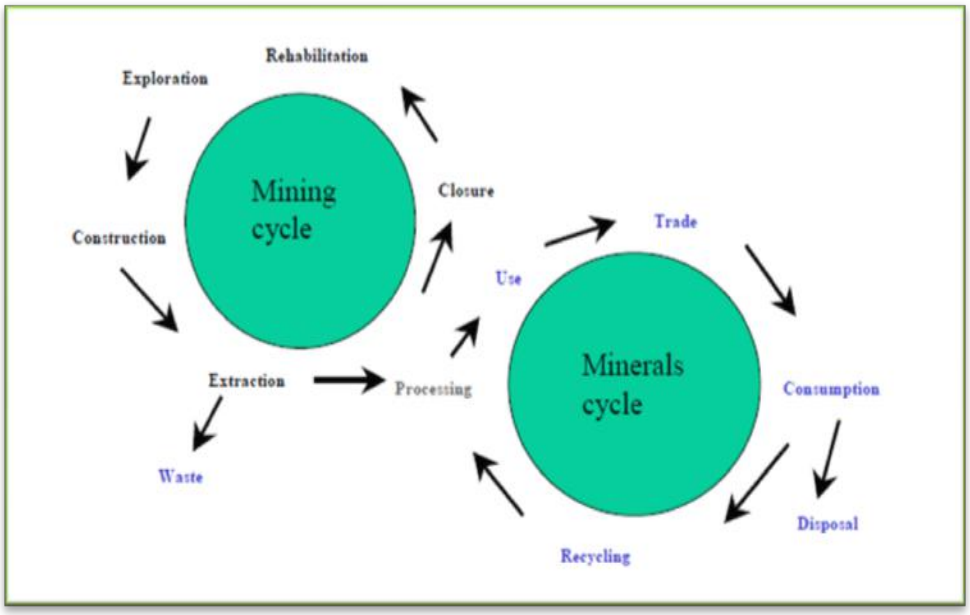


Figure 2: Occupational Health Measures and Engineering Control on Airborne Dust at Workplace.

- AMTC is committed to work towards 'Zero Harm' from their mining activities and carrying out Health Risk Assessment (HRA) for identification workplace hazards and assess their potential risks to health and determine appropriate control measures to protect the health and wellbeing of workers and nearby community.

- The company is & will also maintain accurate and systematic records of the HRA and all the tests carried out.
- The proponent are & will also create awareness and educate the nearby community and workers for Sanitation, Personal Hygiene, Hand washing, not to defecate in open, Women Health and Hygiene (Providing Sanitary Napkins), hazard of tobacco and alcohol use.
- The Baseline HRA for all the category of workers are & will be carried out before joining and thereafter at regular intervals as specified in the DGMS guidelines.
- Developed one dispensary in the colony area & another within the mine site and its managed by qualified doctors & supporting staffs.

- The IME & PME of the employees are conducted outsourced; through Hitech, Joda and other reputed centers who have the expertise in this field and are well equipped to run all the tests under IME/ PME.
- All employees working in the mine have been provided PPE and no one is allowed entry to the mine without PPE.
- Neurological Test and Manganese content in blood sample of the workers engaged at manganese working were undertaken. The results show that there is no manganese contamination in blood samples. The model test results along with Form 'O' is given in the subsequent slides.
- A total budgetary provision of Rs. 60.0 lakhs per annum is envisaged for occupational health Surveillance, Up-gradation of Dispensary, etc.

Items	OPERATING COST per year (in Lakhs)
Safety instruments, equipment's etc.,	4
Occupational Health Surveillance study	22
Up-gradation of Dispensary	10
Consumables	4
Manpower	20
TOTAL	60

- The IME & PME of the employees are being conducted outsourced; through Hitech, Joda and other reputed centres who have the expertise in this field and are well equipped to run all the tests under IME/ PME.
- All employees working in the mine have been provided with proper PPEs and no one is allowed entry to the mine without PPE.
- There is a proposal to upgrade the dispensary within colony with posting of additional qualified medical staffs.
- Neurological Test and Manganese content in blood sample of the workers engaged at manganese working were undertaken. The results show that there is no manganese contamination in blood samples.

5.1. Existing protective measures

The existing environmental status in the mine is so far devoid of any adverse impacts due to the following;

Fixed water sprinkler system has been provided along the haul road and processing area for fugitive dust suppression
Portable water tankers for fugitive dust suppression on the mine benches, mine haul, loading and unloading points and transfer points. Fixed sprinkling arrangements are also provided on mineral dispatch areas.
Dry fog arrangement has been provided in crushing and screening plants.
Construction of parapet/retaining wall, garland drains, settling pits etc., as runoff management.
Construction of Check weirs, Check dams at the strategic locations of Dry seasonal nallas existing within the lease area and planted saplings on the bank of the both sides of the Nallah.

Periodical Environmental Monitoring for various pollutants has been done as per the stipulations.
The vehicles carrying the loaded materials are being released with tarpaulins covers.
Periodical maintenance of plant & machinery.
Acoustic enclosures are provided for all machines operating within the mines.
Latest technology drilling machine with inbuilt dust extraction system, water injecting system with acoustic enclosures is being utilized.
The belt conveyor systems are hooded with GI sheets.
Rainwater harvesting pond has been constructed at various critical points and de-siltation of village ponds.
Planting of trees in various places like near mines office, mine periphery & avenue plantation & other possible places.
Carrying out various CSR activities as per the local need.

The environmental quality of the project is within limits prescribed by statutory bodies and it is amply supported by the periodical monitoring of the environmental quality and the monitored data on various environmental attributes are found to be within permissible limits. These data are periodically submitted to various competent authorities also. Besides this, awareness programme on safety, health, environment are also conducted periodically to the staff and workers of the mines.

- Assure a competent public and personal healthcare workforce.
- Evaluate effectiveness, accessibility, and quality of personal and population-based health services.
- Research for new insights and innovative solutions to health problems.
- Periodical medical camps with specialized doctors of various disciplines will also be held to provide the specialized medical assistance to neighboring communities.
- For improving public health status in the region, a total of INR. 117.5 lakhs is proposed for next 5 years under the CER budget.

Indicator	2018-19	2019-20	2020-21	2021-22	2022-23	Total
Service improvement in existing CHC @ medical equipment, manpower support and other critical work	5	5	5	5	5	25
Mobile health Clinic van @ Rs. 20 lakhs	5	15	0	0	0	20
Periodic health checkup and Program on Adolescent Girls & Youths	2	2	2	2	2	10
Upgradation of AMTC's existing dispensary	20	27.5	0	0	0	47.5
Distribution of 1000 LLIN Mosquito Nets @ Rs. 500/ per piece	1	1	1	1	1	5
Awareness' program on AIDS, Malaria, TB, Anemia etc for core and periphery villages	2	2	2	2	2	10
Total	35	52.5	10	10	10	117.5

5.1.1. Drinking Water Facility:

The mine Management has made the provision of drinking water for all workers. 08 no's of industrial Aqua guard system with cooling facility are provided at various sites to supply portable water to the miners. The detail drinking water facilities is given below in the Table 18.

Table 18

Drinking water Facility

S.N	Location	Number	Remark
1	Fixed Crusher site	01	Aquaguard
2	Time Office	01	
3	Mines Canteen near gate no	02	
4	Contractor Camp at mines	02	
5	Mines Site Office	01	Kent RO
6	Central workshop	01	
7	Laboratory	01	
8	Security Barrack	01	
9	Contractor Camp –Rocktech	01	
10	Contractor Camp –Triveni	01	
11	Screen plant area	02	Sintex tanks
12	Gate No- 01 ,02,03	03	
13	Manual Plot	02	

5.1.2. Rest Shelter:

The mine has provided rest shelter for all of workers as per his requirement.

5.1.3. Lavatory Facilities

There is provision of toilets and urinals for workers at the mine site to facilitate safe & clean environment. The detail toilet facility is given in the Table 19.

Table No.19

Lavatory Facilities

S.N	Location	Urinal	Latrine	Other amminities
1	Site office	06	04	Includes wash basin
2	Fixed crusher plant	01	01	
3	Manganese quarry	08	08	Bath complex
4	Rockteck Camp	04	04	Bath complex
5	Triveni camp	06	06	05 Bath complex
6	Crèche	01	01	-
7	Security barracks	06	06	Bath complex
8	AMTC Lab	01	01	-

All the latrines & urinals are being maintained regularly for making these areas healthy and hygienic.

5.1.4. Personal Protective Equipment:

All the mine workers have been provided with PPE for safe working environment. No miner is allowed to enter into the mine without having proper PPEs. The PPE detail provided during the year 2017-18 is given in the Table 20.

Table No. 20

Personal Protective Equipment

S. N	Name of PPE	Distribution (FY 2017-18)	Stock as on May 2018
1	Safety Shoe	577	323
2	Helmet	577	323
3	Safety Jacket	577	323
4	Goggles	577	323
5	Nose Masks	577	323
6	Ear Plugs	577	323

6. Conclusion and Recommendations

- The noise levels in the nearby residential areas are being regularly monitored by the mine and shows lower noise levels.
- Work zone noise level in most of the operations are > 85 dBA, the mine management is providing PPEs to all the workers working near high noise area and also put warning sign to create awareness among workers.
- Ambient air quality report as well as personal respirable dust is well below the prescribed norms of DGMS.
- Studies of blasting vibrations conducted during 2018 revealed that the vibrations are well within the DGMS limits. Moreover, no building (other than those owned by mine) is located within a distance of 2Km from the mine workings.
- All the mining workers in the present study have been working for <10 years, most of the workers are young workers. It is revealed from the chromatography test report that no worker has Mn. content in blood is more than the standard.
- Koira being a potential zone for Manganese mining with number of working mines, hence periodical health survey will have to be conducted to ascertain the cause of Mn. Content in blood and fibrosis disease.

As per the study and medical examinations conducted among mine workers w.r.t. different occupational diseases, the results reveals that, there is no such occurrence of any kind of occupational diseases i.e. Silicosis, Siderosis, Fibrosis, Pneumococci's etc.

ANNEXURE – 1

AAQ MONITORING REPORT FOR THE REPORTING PERIOD Oct-2017 to March-2018

	Month	Monthly Average Monitoring Results, in micro.gm/CUM			
		PM10	PM2.5	SO_2	NO_x
AAQ-Location-1 Near Magazine (Core Zone)	Oct – 17	79.00	27.60	10.80	12.64
	Nov-17	59.75	23.25	8.53	9.30
	Dec-17	62.50	22.50	10.80	12.11
	Jan-18	78.60	20.40	8.77	9.89
	Feb – 18	84.25	31.25	9.34	10.93
	March-18	83.75	23.88	10.48	11.83
AAQ-Location-2 Near ML Boundary pillar No-1,	Oct – 17	61.90	26.90	11.61	13.00
	Nov-17	70.75	22.63	9.36	10.61
	Dec-17	66.50	24.13	10.29	11.60
	Jan-18	72.90	20.20	9.89	11.49
	Feb – 18	86.75	28.75	10.41	12.14
	March-18	83.63	24.63	9.40	11.76
AAQ Location-3, Kashira Village (buffer Zone)	Oct – 17	69.90	26.20	12.01	13.67
	Nov-17	65.13	19.25	8.95	10.24
	Dec-17	58.75	21.25	9.35	10.74
	Jan-18	81.80	25.80	10.19	11.38
	Feb – 18	67.50	18.00	9.20	10.81
	March-18	85.75	26.88	9.39	10.59
AAQ Location-4, Koira Basti (Buffer Zone)	Oct – 17	72.60	27.00	9.18	10.42
	Nov-17	77.63	24.75	10.91	12.23
	Dec-17	72.50	25.88	10.89	12.21
	Jan-18	81.30	25.30	10.39	11.65
	Feb – 18	82.00	29.38	10.43	11.90
	March-18	88.25	27.75	10.40	11.53
NORMS		100	60	80	80

Noise Data for FY-2017-18:-

Sl. No.	Locations	NOISE LEVEL, Leq.in dB (A) from data log of monitor.											
		April-17		May-17		June-17		July-17		Aug-17		Sep-17	
		Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Work Zone Noise Report													
1	Magazine Area	57.2	53.4	55.1	49.3	54.9	46.2	56.5	47.1	68.8	58.8	71.1	59.3
2	ML Boundary Pillar No-1	59.5	55.6	58.3	53.5	56.5	51.9	57.2	50.4	60.0	49.7	62.4	50.2
Ambient Noise Report													
1	Kasira Village	53.4	41.2	46.9	40.1	49.2	42.7	48.9	41.2	47.6	38.3	49.8	39.1
2	Koira basti	51.7	43.9	50.4	41.6	47.1	40.3	49.6	42.7	51.2	40.8	48.3	34.6
Norms		**Residential. Leq:** **Day Time : 55 dB (A), Night Time : 45 dB (A)**											
		Industrial, Leq: Day Time : 75 dB (A), Night Time : 70 dB (A)											

Sl. No.	Locations	NOISE LEVEL, Leq.in dB (A) from data log of monitor.											
		Oct-17		Nov-17		Dec-17		Jan-18		Feb-18		March-18	
		Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Work Zone Noise Report													
1	Magazine Area	68.6	55.7	64.9	51.9	66.0	57.6	69.9	62.4	67.8	62.1	67.8	62.1
2	ML Boundary Pillar No-1	60.8	57.2	67.2	52.4	63.9	53.5	64.5	59.7	66.7	60.2	68.9	61.3
Ambient Noise Report													
1	Kasira Village	48.7	34.2	44.9	30.8	47.9	36.9	50.8	34.7	48.6	37.5	47.2	33.2
2	Koira basti	49.8	42.9	48.3	39.7	50.2	40.8	49.6	37.0	52.4	39.6	50.5	40.1
Norms		**Residential. Leq:** **Day Time : 55 dB (A), Night Time : 45 dB (A)**											
		Industrial, Leq: Day Time : 75 dB (A), Night Time : 70 dB (A)											

PHOTOS OF HEALTH CAMP

Annexure - 7

ARYAN Mining & Trading Corporation Pvt. Ltd.
(Formerly Aryan Mining & Trading Corporation Ltd.)
CIN : U13100WB1936PTC008817

Ref: 704 / AMTC/ MoEF&CC/ 18-19

Dated: 09.11.2018

The Joint Director (S),
Ministry of Environment, Forest & Climate Change,
Eastern Regional Office,
A/3, Chandersekharpur
Bhubaneswar – 751023

Sub: Expansion of "Narayanposhi Iron & Manganese Ore Mines of Aryan Mining & Trading Corporation Pvt. Ltd. extend over an area of 349.254 Ha in the villages of Koira & Kashira and Kathamala RF, Tehesil Bonai, district Sundargarh, Odisha.

O/C

Ref: File No. 101-729/EPE/3317 dated 25.10.2018

Dear Sir,

With reference to the above cited subject regarding certified compliance report in respect of Narayanposhi Iron & Manganese Ore Mines of M/s Aryan Mining & Trading Corporation Pvt. Ltd., we are herewith submitting the point wise information/action plan for your kind perusal.

Thanking You
Yours truly,

For Aryan Mining & Trading Corporation Pvt. Ltd

09/11/18

General Manger (Geology & Envt)

14.11.18

GOVT. OF INDIA
MoEF & CC, Eastern R.O.
Bhubaneswar
14 NOV 2018
RECEIVED

Mines : Narayanposhi, Mn / Iron Mines, P.O. : Koira, Dist : Sundargarh, Orissa - 770 048, Ph : 06625-211194, Telefax : 06625-235112
e-mail : koira@aryanmining.in
Mahulsukha Mn Mines, Bhutra, Via-Barsuan, Dist. : Sundargarh, Orissa - 770 041, Ph : 06625-211193
Regd. Office : Aryan House, P-1, Hide Lane, 8th Floor, Kolkata - 700 073, Ph : +91(0)33 2236 4601 / 2237 0935, Fax : +91(0)33 2236 4602
e-mail : contact@aryanmining.in, website : www.aryanmining.in

Appendix – I

Si No.	Condition	Compliances
a	**It is required to increase the green belt area by planting more plants during ongoing monsoon period and also put stress to achieved optimum plantation density i.e., 2500 plant per ha in plantation area/ non-plantation area including safety zone.**	This is to bring your kind notice that so far 153803 Nos. of saplings were planted over an area of 40.971 Ha within the ML area including dump & safety zone with a plantation density of about 2500 plant per Ha. In addition, 76462 Nos. of saplings were planted over an area of 10.305 Ha outside the ML area & 8085 Nos. of saplings were planted/distributed to nearby villages, schools etc. Further it is ensured that we will do plantation @ 2500 saplings in upcoming monsoon in line with approved mining plan.
b	**It is required to clean the all rain water harvesting structures / pit before and after the monsoon.**	It's our general practice to clean the rain water harvesting structures/pit before & after monsoon. It will be continued as suggested.
c	**It is required to maintain the garland drain, settling tank etc. all around the OB area etc. on regular basis.**	We have been maintaining the garland drain, settling tank around the dump by way of de-silting before & after monsoon, stone pitching on regular basis and the same will be continued as suggested.

For Aryan Mining & Trading Corporation Pvt. Ltd

For Aryan Mining & Tradin
Corporation Pvt. Lt

09/11/18

GM(Geology & Envt)

General Manger (Geology & Envt)

ANNEXURE - 1

<table>
<tr><th>Sl. No.</th><th>Points by RO-MoEF&CC</th><th>Compliance</th><th colspan="2">Action Plan</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">It is required to increase the green belt area by planting more plants during ongoing monsoon period and also put stress to achieved optimum plantation density i.e., 2500 plant per ha in plantation area/ non-plantation area including safety zone.</td><td rowspan="2">This is to bring your kind notice that so far 153803 Nos. of saplings were planted over an area of 40.971 Ha within the ML area including dump & safety zone with a plantation density of about 2500 plant per Ha.
In addition, 76462 Nos. of saplings were planted over an area of 10.305 Ha outside the ML area & 8085 Nos. of saplings were planted/distributed to nearby villages, schools etc.

Further it is ensured that we will do plantation @ 2500 saplings in upcoming monsoon in line with approved mining plan.</td><td>Plantation Care during the Year</td><td>Post Plantation Care</td></tr>
<tr><td>- Project maintains the plant density of 2500 nos. of sapling per Ha throughout the year
- Project makes alignment and stacking with proper spacing between plants.
- Project does the pit excavation during Apr-May for carrying out the plantation in June.
- Project performs weeding and manuring at the time of plantation
- Project performs the watering during non-monsoon periods i.e. from Apr-Jun and Nov-Mar
- Project performs bush cleaning at regular intervals.
- Project has planned to carry out 16128 nos. of sapling during next financial years.
- Project abides and performs the instruction made by the different Forest and SPCB officials to carry out the urban/avenue from time to time
- Project distributes fruit bearing & medical plants to local villagers, schools, clubs etc. to create awareness.</td><td>- Project does the causality replacement of plants during mon-soon period only, if any
- Project makes 1st weeding and manuring after mon-soon period
- Project does soil working and application urea & NPK at regular intervals
- Project continues 8 months watering @ 4 days /month during Apr-Jun and Nov-Mar.
- Project performs bush cleaning at regular intervals.</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">It is required to clean the all rain water harvesting structures / pit before and after the monsoon.</td><td rowspan="2">It’s our general practice to clean the rain water harvesting structures/pit before & after monsoon. It will be continued as suggested.</td><td>Activities carried during Nov/Dec (Post-monsoon)</td><td>Activities carried during May/Jun (Pre-monsoon)</td></tr>
<tr><td>- Project cleans all the rain water harvesting pits during Nov/Dec.
- Project changes the filter media of the roof top rain water harvesting pits
- Project maintains the pipe line and gutter works for a leakage free flow of water.</td><td>- Project cleans all the rain water harvesting pits during Nov/Dec.
- Project changes the filter media of the roof top rain water harvesting pits
- Project maintains the pipe line and gutter works for a leakage free flow of water
- Project carries de-siltation of the settling ponds/pits and check dams during Pre-monsoon periods i.e. May
- Project also carries de-silting of the surrounding village ponds during Pre-monsoon periods i.e. May.</td></tr>
<tr><td>3</td><td>It is required to maintain the garland drain, settling tank etc. all around the OB area etc. on regular basis</td><td>We have been maintaining the garland drain, settling tank around the dump by way of de-silting before & after monsoon, stone pitching on regular basis and the same will be continued as suggested.</td><td colspan="2">Activities Performed throughout the seasons
- Project maintains the garland drains throughout the seasons.
- During rainy seasons, project also maintains the bonds, check weirs, settling pits etc.
- Project uses flocculants for further settlement of the suspended particles of the runoff water
- Project maintains the retaining wall based on the dump and rain fall criteria with adequate dimensions.</td></tr>
</table>

Annexure - 8

PROCEEDINGS OF THE FIRST MEETING OF THE COMMITTEE TO OVERSEE IMPLEMENTATION OF THE RECOMMENDATIONS OF NEERI REPORT HELD ON DATED 21.06.2018 AT 03.30 P.M. UNDER THE CHAIRMANSHIP OF THE CHIEF SECRETARY, ODISHA IN 2ND FLOOR CONFERENCE HALL OF THE SECRETARIAT.

****

The first meeting of the Committee to oversee the implementation of the recommendations of the NEERI report was held on dated 21.6.2018 under the Chairmanship of the Chief Secretary.

The list of the members attended the meeting is at **Annexure-'A'.**

At the outset, the Principal Secretary, Steel & Mines Department welcomed the Chairman and all other members of the committee and briefed about the NEERI report. This was followed by detailed power point presentation on the NEERI report by the Director of Mines. It was noted that the report of the NEERI has been approved by the MoEF, Government of India and its implementation has to be ensured by all agencies concerned.

After threadbare discussion and deliberations on each of the recommendations of NEERI report, the following decisions were taken:-

1. Sustainable Annual Production (SAP) as suggested in the report of NEERI, may be worked out lease wise in advance for each year by the Director of Mines and incorporated in the i3MS so as to ensure that the limits are not exceeded by any lessee.

[Steel & Mines Department / DoM]

2. Continuous Ambient Air Quality Monitoring System of different environmental quality parameters as per EC & CTE / CTO conditions has already been put in place in respect of 5 MTPA mines. This monitoring be expanded to include 3 MTPA and above mines as recommended by the NEERI. SPCB was asked to ensure its implementation.

[Forest & Environment Department/ SPCB]

3. On other recommendations viz construction of cement concrete road from mine to the main road, Suggested Ore Transport Mode (SOTM) and

parking plazas etc, it was decided to form District Level Committees under the Chairmanship of District Collectors to decide on the modalities for implementation. Constraints, if any, in implementation of such recommendations may be reported by the DLC's to the Steel & Mines Department.

[Steel & Mines Department/ DoM/ Collectors concerned]

4. Tarpaulin cover may be ensured in all mineral carrying vehicles to prevent re-suspension of dust. As regards vacuum cleaning of the roads, the matter may be examined with regard to its practicability for implementation by the DLC's and agencies concerned.

[Steel & Mines/ Commerce & Transport/ Works Department/ DLC's]

5. Master plan for development of road network in Joda-Barbil and Koira sectors may be prepared by the Works Department and funding of the same from different sources may be planned.

[Works Department]

6. The recommendations of NEERI with regard to construction/ maintenance of Dust & Pothole free roads including expansion of NH-215 to four laning may be forwarded to the National Highway Authority of India (NHAI) and also Ministry of Surface Transport, Government of India through Works Department for appropriate action.

[Works Department]

7. The recommendation with regard to transportation through river (Jetty) to nearest sea port (Sea Cargo option) may be forwarded to the Government of India for appropriate action through the Commerce & Transport Department.

[Commerce & Transport Department]

8. Recommendations with regard to new railway lines and railway sidings may be forwarded to the Ministry of Railway/ Railway Board through Commerce & Transport Department for appropriate action.

[Commerce & Transport Department]

9. A sub-committee comprising the Additional Chief Secretary, Forest & Environment Department (Chairman), Secretary, Steel & Mines Department, Member Secretary, SPCB, representatives of all the Departments and Director of Mines (convener) concerned including NHAI, Railways and IMMT may be constituted to oversee the implementation of various recommendations of NEERI report. This sub-committee may meet once in two months. The State Level Committee to oversee the implementation of recommendation of NEERI report may meet once in six months or as required.

[Steel & Mines Department / Forest & Environment Department]

10. The Steel & Mines Department may prepare a matrix of various recommendations of NEERI report along with list of agencies responsible for implementation thereof and monitor the status of implementation on a regular basis.

[Steel & Mines Department]

The meeting ended with vote of thanks to the Chair and other participants.

The minutes are issued with approval of the Chief Secretary.

13.7.18

Additional Secretary

Annexure-A

MEMBERS PRESENT IN THE MEETING OF THE COMMITTEE TO OVERSEE IMPLEMENTATION OF THE RECOMMENDATIONS OF NEERI REPORT HELD UNDER THE CHAIRMANSHIP OF THE CHIEF SECRETARY, ODISHA ON 21.06.2018 AT 03.30 P.M. IN THE 2ND FLOOR CONFERENCE HALL.

SL No	Name	Designation	Signature
1			
2	T. K. Pandey	Pr. Secy, Finance	
3	R K Sharma,	Prl Secy, S&MD&PT	
4	Deepak Mohanty	Director of Mines, Odisha	
5	Dr Bibekananda Swain	PCCF & HoFF	
6	N. K. Pradhan	Secy. W&S	
7	S. K. Goyal	Scientist & Head NEERI, Delhi	
8	G. C. Behera	Deputy Controller of Mines, IBM	
9	Ranjan Kumar Das	Collector, Jajpur	
10	Ashish Thakare, IAS	DM and Collector, Keonjhar	21/6/18
11	Surendra Kumar Meena IAS	Collector Sundergarh	21/6/18
12	VINEET BHARDWAJ	Collector Mayurbhanj	21/6/18
13	K. S. Pradeep	ED, OMC	21/06/18

SL No	Name	Designation	Signature
14	R. K. Dey.	APCCF Central MoEF & CC	21.6.15
15	R. Vineel Krishna.	MD, OMC	
16	Debdutta Biswal	Spl Secy. F & E HS. SPCB.	
17	Manoj Mishra	Spl Secy CAT Deptt.	
18	J. Prasad	DY. DG GSI	
19	M. K. Patel	Director NIT	
20	Dr. U. C. Jena	J & M	
21			
22			
23			
24			
25			
26			
27			

URGENT

OFFICE OF THE DEPUTY DIRECTOR OF MINES, KOIRA CIRCLE, KOIRA
DISTRICT: SUNDARGARH

E-mail: ddm.koira@orissaminerals.gov.in

Letter No. 3004 /Mines, dt. 26/06/2018

From:

The Deputy Director of Mines,
Koira, Dist. - Sundargarh

To

All Lessees
Koira Mining Circle

Sub: Convening a meeting for implementation of the recommendations of National Environmental Engineering Research Institute (NEERI).

Ref: Letter No.333/Mining, dt.26.06.2018 of Collectorate, Sundargarh (Mining Section).

Sir,

In inviting a reference to the letter on the above cited subject, it is to inform you that a meeting is scheduled to be convened on **dt.02.07.2018** at **10:30am** at Pragati Mandap, Sundargarh under the Chairmanship of the Collector & District Magistrate, Sundargarh regarding the suggestions given for implementation of recommendations by NEERI.

In this context, you are requested to attend the meeting on the scheduled date & time at the venue fixed without fail.

Yours faithfully,

26/6/2018

DEPUTY DIRECTOR OF MINES, KOIRA

Memo No 3005 /Mines, dt. 26/06/2018

Copy to all the Sr. Inspectors of Mines, Koira for information and necessary action. They are instructed to pursue with their concerned lessees for their attendance in the meeting positively.

26/6/2018

DEPUTY DIRECTOR OF MINES, KOIRA

Memo No 3006 /Mines, dt. 26/06/2018

Copy forwarded to the Addl. District Magistrate, Sundargarh for favour of kind information with reference to Letter No.333/Mining, dt.26.06.2018.

26/6/2018

DEPUTY DIRECTOR OF MINES, KOIRA

47

COLLECTORATE: SUNDARGARH
(Mining Section)
No. 333 /Mining, Dt. 26.06.2018

To

The Deputy Director of Mines, Koira

Sub.:- Convening of a meeting for implementation of the recommendation of National Environmental Engineering Research Institute (NEERI).

Sir,

It has been decided to convene a meeting regarding suggestion given for implementation of recommendation of NEERI on **02.07.2018** at **10.30 A.M**. at **Pragati Mandap, Sundargarh** under the Chairmanship of the Collector and District Magistrate, Sundargarh.

You are therefore requested to please intimate all the Lessees of Iron and Manganese Ore Mines to attend the meeting in the schedule date, time and venue fixed positively.

You are also requested to attend the meeting without fail.

Yours faithfully,

25/6/18

Addl. Dist. Magistrate,
Sundargarh

Memo No. 334 /Mining, Dt. 26.06.2018

Copy forwarded to the Divisional Forest Officer, Bonai/ Regional Officer, SPC Board, Regional Office, Rourkela for information. They are requested to attend the meeting on schedule date, time & venue positively.

25/6/18

Addl. Dist. Magistrate,
Sundargarh

ACTION PLANS ON THE RECOMMEDATION OF NEERI CARRYING CAPACITY STUDY
Annexure- 9

C. 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"		
	Lessee hereby declares that "they will follow the guidelines/policy decision by the MoEF&CC, Govt. of India and State Govt. Odisha in regard to the implementation of the recommendations given by NEERI in its carrying capacity study report in respect to Odisha". ***However, point wise compliance of the NEERI conditions given below.***		
Si. No.	**NEERI RECOMMENDATION**	**COMPLIANCE**	**Action Plan**
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.	***Since 3 years Dept. of Steel & Mines, Govt. Odisha fixing the annual production capacity of each mine both in Joda & Koira sector considering different limiting factors like requirement, environment, infrastructure etc. In coming years we will abide by the sustainable production limit of State Govt.***	***Being followed by the Directions from Dept. of Steel & Mines, Govt. of Odisha in this regard.***
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**	***Presently Manganese production from the mine is 0.036 MTPA. There is no expansion for Mn proposed in this proposal.***	***We will abide by said recommendation***
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 re- suspension 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 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.	***We are operating the mines with strict compliance to monitoring of environmental quality parameters as per EC and CTE/CTO and implemented the suggested measures for control of road dust and air pollution. Six monthly EC Compliance and yearly CTO compliances being submitted to respective Authorities.*** ***Different existing &***	***Monitoring of environmental quality parameters and site inspection by Govt. Authorities say SPCB, MoEF&CC and IBM being followed on regular basis.***

	Regional office of the MoEF&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	***proposed environmental measures towards control of pollution (air, water, soil, noise, etc.) is described in para –4.2 & its sup paras, Chapter -IV.*** ***Certified EC Compliance report by Director, Regional Office, MoEF&CC, GoI is attached as Annxure 23.*** ***Regional office of the Indian Bureau of Mines (IBM) regularly monitoring the mines i.e. MCDR inspection in 6 monthly basis to monitor the mining plan and yearly for Star rating.***	
4	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.	***We will abide the State Govt. decision towards production from mine in line to commensurate infrastructure improvement (viz. SOTM, pollution free road transport, enhancement of rail network etc.)***	***We will abide the said recommendation as explained***
5	Continuous monitoring of different environmental quality parameters as per EC and CTE/CTO conditions with respect to air, noise, water (surface & 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 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	***Monitoring of all the environmental parameters is being done in the core as well as buffer zone of the ML area. Monitoring of air, noise, water, soil carried out every month as per the stipulations of MoEF/SPCB.*** ***Besides the above SPCB, Regional office, Rourkela used to monitor all environmental parameter regularly.*** ***Outside the mine lease area Govt. of Odisha through SPCB, Odisha placed online AAQ***	***Environmental monitoring & submission of compliance and it's evaluation at authorities being followed on regular basis.***

	holders and study reports prepared by other concerned departments/agency for each of the regions should be evaluated and examined by SPCB/ MoEF&CC.	***monitoring station at strategic locations to know the real time data on 24 hour basis.*** ***AAQ monitoring data given in Annexures-16 shows that all the environmental parameters are within the prescribed limit as per the guideline by MoEF&CC / SPCB.*** ***Till the date environmental quality parameters have not indicated any adverse impact on the environment and it will be ensured in future also.*** ***The reports submitted by the lessee are being evaluated by the SPCB & MoEF&CC (regional office) in six monthly & yearly basis.***	
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.	***Since existing NH-215 is passing through the lease and exit gate of mine working area is connecting the same. So there is no such requirement in this case.***	***Concrete road inside the mine lease area already completed.***
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.	***NH-215 passes through the lease area and is under four lanning. The road is being constructed as per the IRC guidelines. Beside this we have provision to make proper drainage system with fencing & plantation the***	***Govt. of Odisha is preparing its own action plan towards implementation of SOTM as per the minutes of meeting dated 21.06.2018.*** ***We will abide by the guidelines formed by***

	It is mentioned by State Govt. of Odisha that currently about 45% of the iron ore is dispatched 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. Table : EC Capacity based Suggested Ore Transport Mode (SOTM) Code | EC | Suggested Ore Tra SOTM 1 | ≥ 5 MTPA | 100% by private or conveyor belt railway siding or captive mines and captive mines SOTM 2 | Between 3 and <5 MTPA | Minimum 70% railway siding, thro belt and maximum 3 direct to destina public railway sidi SOTM 3 | Between 1 and < 3 MTPA | Minimum 70% by siding and maxim road - direct to des other public railw above options SOTM 4 | <1 MTPA | 100 % by 10/17 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	***stretch of the road passes within the lease area.*** ***In recent past meeting held between Collector Sundargarh on dated 03.07.2018 with all lessees in this regard.*** ***We will abide by the SOTM system as and when guideline formed by the Department of Steel & Mines, Govt. of Odisha in this regard.***	***the State Govt. as & when.***

	itself, and should have system in place within next 5 years However, the State Govt. of Odisha shall ensure 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. **Responsibility: Individual Mine Lease Holders; Time Period: 1 Year**	***Already there are two parking area inside the mine lease. Rest room & toilet already made.***	***Two no's of parking plaza inside the mine premises already completed.***

ACTION PLANS ON THE RECOMMEDATION OF NEERI CARRYING CAPACITY STUDY
Annexure- 9

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.**	***In this regard project will extend the support if any desired by the State Government.***	***NHAI is being followed.***
10	Regular vacuum cleaning of all mineral carrying roads aiming at "Zero Dust Re-suspension" may be considered. **Responsibility: PWD / NHAI/ Mine Lease Holders ; Time Period: 3 months for existing roads**	***Sweeping on the mineral transport road is presently under practice by Lessee. Further vacuum cleaning will be adopted as per the instruction from Authorities.***	***However we are in the process of procuring one no of vacuum cleaner.*** ***Further we will abide by the directions from Authorities if any.***
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.**	***Our proposed expansion is going through detail EIA/EMP study (as per the provisions of EIA Notification 2006, as amended time to time) with proper justification on demand & supply scenario for iron ore requirement and availability of pollution free transport network in the region.***	***It is being followed in regard to this proposal.***
12	**Mine-wise Allocation of Annual Production:** 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 & 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)	***Since 3 years, Dept. of Steel & Mines, Govt. Odisha fixing the annual production capacity of each mine both in Joda & Koira sector considering different limiting factors like requirement, environment, infrastructure etc.*** ***In coming years we will abide by the allowable suggested production/dispatch quantity of Dept. of Steel & Mines, Govt. of Odisha.***	***Being followed by the Directions from Dept. of Steel & Mines, Govt. of Odisha in this regard.***

ACTION PLANS ON THE RECOMMEDATION OF NEERI CARRYING CAPACITY STUDY
Annexure- 9

	<table><tr><td rowspan="2">Mine</td><td rowspan="2">EC Capacity</td><td colspan="6">Suggested Annual Production (MT)</td></tr><tr><td>2016-17</td><td>2017-18</td><td>2018-19</td><td>2019-20</td><td></td><td>2020-21</td></tr><tr><td></td><td></td><td>Yr 1</td><td>Yr 2</td><td>Yr 3</td><td>Yr 4</td><td></td><td>Yr 5</td></tr><tr><td>Mine 1</td><td>X1</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Mine 2</td><td>X2</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Mine 3</td><td>X3</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Mine n</td><td>Xn</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Total</td><td>160 + dX</td><td>105</td><td>129</td><td>153</td><td>177</td><td></td><td>201</td></tr><tr><td colspan="8">Next year allocation = Average of EC Capacity and Last year production</td></tr></table>			
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 upto 2020 is about 85 MTPA, whereas actual production from these mines has been only 44.677 MT (52.6%) during 2015-16 and 57.07 MT (67.1%) during2016-17. 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 EAC and grant of EC) takes about one year time. Under such circumstances, it is suggested that further applications 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 & Mines and MoEF&CC,**	***Narayanposhi Iron & Mn Mine has already achieved the existing EC quantity for Iron i.e. 3.00 Million Ton and having all the statutory clearances.*** ***For the proposed expansion Mining plan already approved, ToR granted by MoEF&CC, Baseline data collected, Draft EIA/EMP prepared, Public hearing conducted. Final EIA/EMP is submitted towards grant of Environmental Clearance.***	***This proposal is being processed as per the said recommendation.***

	New Delhi.		
14	Sustained Iron Ore Production beyond 2020: 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**	***As per the MMDRA 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, State Govt. of Odisha is in process to auction the virgin areas and also the mines which are going to close in 31st march 2020 to ensure continued availability of iron ore from the region***	***State Govt. is being working in this regard.***
15	Reserves Estimation–Mining Plan and Exploration: Appropriate actions (geo-technical investigation for qualitative and quantitative resource estimation & 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 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	***As per the MMDRA Act 2015, detailed exploration is required (i.e. geo-technical investigation for qualitative and quantitative resource estimation) before auction the mines.*** ***State Govt. of Odisha and also IBM has given instruction to each lease holder to complete the detailed exploration of the potential mineralized area under G2 category by 31st March 2019.*** ***For this mine, the entire area is explored under G2 category.***	***Detailed exploration under G2 category already completed.***

	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 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**	***The mine is being operated as per the approved mining plan/scheme by IBM in a sustainable manner.*** ***Manganese quarry of this mine has already touched the ground water table, for which necessary clearance (NOC) already obtained from CGWA.*** ***As per the existing Modified mining scheme back filling has been continuing since 2016-17 in the exhausted portion of Quarry-3.***	***With due approval from CGWA for mining below ground water table and scientific mining being followed as per approved scheme of mining by IBM.***
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 upto 45% by2020 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**	***In this context, the project has proposed 2.0 MTPA beneficiation plant towards utilization of low-grade iron ore.*** ***For other aspects like utilization of waste water in cosmetic & pharmaceutical industries, the State Government may carry out R&D studies in future.***	***As proposed the Beneficiation plant will be established within 3 months after grant of EC.*** ***Further we will abide the guidelines by IBM/ Dept. of Steel & Mines for utilization of waste water having high conc. Of Fe.***

ACTION PLANS ON THE RECOMMEDATION OF NEERI CARRYING CAPACITY STUDY
Annexure- 9

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 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 lengthof rail network/ conveyor system for 8 mines (under SOTM 1 & 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 & Mines, Govt. of Odisha and Concerned Mines along with Indian Railways**. **Time Period: Maximum 7 years (by 2025). The Department of Steel &Mines, Govt. of Odisha should follow-up with the concerned Departments and railways so that proposed proper rail network is in place by 2025**	***In this regard Dept. of Steel & Mines, Govt. of Odisha, Collector of Sundargarh and Keonjhar and representatives of respective mines has preliminary discussed to find out the way for installation of conveyor belt to railway siding and also development rail network from mines to nearest railway sidings.*** ***We will abide by the decision of Dept. of Steel & Mines, Govt. of Odisha in this aspect.***	***Recommendation with regard to new railway lines and railway sidings forwarded to the Ministry of Railway/Railway Board through Commerce & Transport Department for appropriate action as per the decision taken in the meeting on dated 21.06.2018 at Chief Secretary, Odisha.*** ***Further we will abide by the guidelines as & when formed.***
19	State Govt. of Odisha shall make all efforts to ensure exhausting all the iron & 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 & Mines, Govt. of Odisha**	***State Government of Odisha will take decision in this aspect to ensure exhaust of all the iron & manganese ore resources in the existing working mines and from disturbed mining leases/zones in Joda and Koira region.***	***Dept. of Steel & mines is being working in this regard.***
20	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 & Mines, Govt. of Odisha**	***All the mines whether large, medium or small are under operation on the basis of approved Mining plan/Scheme by IBM. PMCP & FMCP are made as per the designed format by IBM and continuously implementing the same.*** ***Department of Steel & Mines, Government. of***	***Dept. of Steel & mines is being working in this regard.***

		Odisha to take appropriate actions while auctioning the mine towards fixing the area.	
21	**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 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**	***Mining activity is being carried out as per the approved mining plan.*** ***Machineries carry out various mining operations are generate minimal dust/air pollution, noise, wastewater and solid waste. e.g. drills are operated with dust extractors & also equipped with water injection system.*** ***Implementing better environmental technology and environmental measures towards eliminate/ minimize generation of air pollution/dust, noise, wastewater, solid waste generation. Details are discussed in Chapter-IV.*** ***Further, we used to ensure towards inspection and maintenance of all the machineries/ equipment/ transport vehicles as per manufacturer's instructions/ recommended time schedule and maintain records.*** ***As per the EC and CTO conditions, we have implemented all the environmental measures towards management of Air, Water, Noise, Soil, Biological etc. The details***	***Being the part of day to day mining activities as approved scheme of mining as explained being followed.***

	Holders	***are described in chapter - IV.*** ***Digital processing of the entire lease area using remote sensing technique is being carried out regularly once in 3 years.***	
22	**Air Environment Related**: (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 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	***The monitoring of AAQ is being done in the core as well as buffer zone of the ML area in 5 locations. Monitoring of AAQ is carried out twice in a week per station. The monitoring report reveals that the parameters like PM_{10}, $PM_{2.5}$, SO_2 and NOX are within the norm as per NAAQs notifications made by the CPCB.*** ***The monitoring stations have been established basing on the metrological data, topographical features and environmentally and ecologically sensitive targets.*** ***To control emission of dust from the mine, we have adopted fixed water sprinkling system for sprinkling of water on haul roads & processing yards.*** ***In addition, portable water sprinklers are deployed for water sprinkling on haul roads and other dust prone areas.*** ***We are regularly monitoring the emission of the vehicle to ascertain***	***Being followed on regular basis.*** ***Further in regard to proposal installation of 1 no of continuous online AAQ monitoring station, order already placed. Expected installation by end of January.***

	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: Individual Mine Lease Holders and SPCB.**	***emission limits as per the pollution norms. The tests are being conducted on regular basis by engaging authorized Pollution Testing Centre. The maximum value of K – factor & HSU found to be 1.37 and 0.53 respectively. Higher capacity trucks are being encouraged for mineral transportations. The vehicles carrying the loaded materials are being released with tarpaulins covers.*** ***The details air quality existing & proposed control measures are described under para 4.2 onwards in Chapter-IV***	
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 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 atleast once in month, and mapped for any significant changes due to successive mining operations.	***Blasting operation is being carried out in day time only. Control blasting is being carried out as per the recommendation/suggestion by Central Institute of Mining & Fuel research (CIMFR). Noise & vibration is being monitored in regular basis. Source wise noise also monitored on regular basis.*** ***Workers engaged in operations of HEMM, etc. are provided with ear plugs/muffs, nose mask etc.*** ***The details are given in para 4.4.2, chapter-IV in EIA/EMP.***	***Being followed on regular basis as explained.***

	Responsibility: Individual Mine Lease Holders.		
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. 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 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	***Manganese quarry of this mine has already touched the ground water table, for which necessary Hydro-geological study has been conducted and clearance (NOC) already obtained from CGWA. (Annexure – 6)*** ***The detail of hydrogeology study is given in EIA/EMP.*** ***No natural watercourse has been obstructed due to mining activity. Regular monitoring of flow rate, quality both in up-stream & down-stream is being carried out in Orahuri Nalla &Karo Nalla.*** ***Ground water quality & level monitoring is being carried out both in core & buffer zone. Piezometer is installed in observation well inside lease area.*** ***The project has implemented roof top rain water harvesting structures in the colony premises with recharge wells. Apart from that, de-siltation of the village ponds surrounded by ML area has undertaken towards percolation cum rain water harvesting purposes and it is being de-silted after each monsoon.*** ***The Project has already installed oil and grease separation unit cum ETP***	***Being followed on regular basis as explained.*** ***Further, Proposed activities towards environmental measures will be implemented soon after grant of Environmental Clearance.***

	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 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.**	***for treatment of the workshop effluents with the provision of the filtering system & water recycling arrangement.*** ***The domestic waste water is being treated through 15 KLD capacity sewage treatment plant with filtering system of ACF and MMF.*** ***There are 02 nos. overburden / waste dumps at the earmarked areas as per modification to the scheme of mining which is duly approved by IBM. The project is also and maintaining the proper height up to 30m with 03 no. of terraces and slope of about 37^0 with the horizontal. Back–filling of Q-3 has already commenced from the FY 2016-17. An area of about 26,492 m2 is covered with coir mat with dump slopes are applied with natural grass seedlings for dump stabilization. In addition, 5231 no's saplings, 527 no's vetiver and sue babul seedlings and 13145m2 grass patching have been made over the dump slope to control erosion and surface run off. The project has made retaining wall and garland drains at toe of the all-around dumps connecting to the Settling pit.*** ***Majority of the runoff is channelized to settling***	

		cum percolation pits. Adequate protection measures such as construction of check dams, de-siltation pond, retaining wall and settling pits with coco filter arrangement across the outlet have been made to conserve and protect the natural water courses. ***22 no's. of check dams have been constructed at strategic points to prevent run-off water and flow of sediment directly into nearby water bodies.*** ***The water so collected in the harvesting pond within the mine is being utilized for the sprinkling on hauls roads & green belt development.*** ***The details are described in Chapter-III & chp-IV in EIA/EMP.***	
25	**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	***The total quantity of top soil generation up to 31st March 2018 is 2269.60m³. Out of these, 911m³ has been used for stabilization and plantation work along the safety zone, development of garden etc. The remaining 1358.60 m³ has been stockpiled at an earmarked area over an area of 0.16 Ha. Grasses have been developed over this area for preservation of nutrients content. 130m length (W-1m, H-1m) of retaining wall & 120m garland drain have been***	***Being followed on regular basis as explained.*** ***Further, Proposed activities towards environmental measures will be implemented soon after grant of Environmental Clearance.***

	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. (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 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 de-silted 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**	***constructed around the stock for arresting the runoff and retention of nutrients values.*** ***There are 02 nos. overburden / waste dumps at the earmarked areas as per modification to the scheme of mining which is duly approved by IBM. The project is also and maintaining the proper height up to 30m with 03 no. of terraces and slope of about 37^0 with the horizontal.*** ***An area of about 26,492 m2 is covered with coir mat with dump slopes are applied with natural grass seedlings for dump stabilization. In addition, 5231 no's saplings, 527 no's vertiver and sue babul seedlings and 13145 m^2 grass patching have been made over the dump slope to control erosion and surface run off. The project has made retaining wall and garland drains at toe of the all-around dumps connecting to the Settling pit.*** ***The project has implemented the Retaining walls (5778.35 m) followed by garland drains (6728m), Check dams/check weirs (22 nos.), Sedimentation ponds cum Settling Ponds (18 nos.) and these are being maintained/de-silted after each monsoon***	

		based on the annual average rain fall data. ***Hazardous waste mainly waste oil, lubricants, used cotton is being be sold to SPCB Authorized dealer.*** ***The details are described in Chapter-III & chapter-IV in EIA/EMP.***	
26	**Ecology/Biodiversity (Flora-Fauna) Related**: (i) As per the Red List of IUCN (International Union for Conservation of Nature), six floral species and 21 faunal species have been reported to be under threatened, vulnerable & endangered category. Protection of these floral and faunal species should be taken by the State Forest & 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 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	***Site Specific Wildlife Conservation Plan got approved by PCCF Wildlife and Chief Wild Life Warden, Bhubaneswar with an estimated cost of Rs. 288.00 lakh of which Rs. 92.00 lakh has been earmarked for implementation of the Plan within the Mining Lease area and Rs. 196.00 Lakh has been earmarked for implementation in the buffer zone i.e. within the zone of influence and the same got approved by PCCF(Wildlife) & Chief Wild Life Warden, Odisha, vide memo no-6260 Dated-04/09/2010 & accordingly an amount of Rs. 2, 88, 00000.00 has been deposited vide DD No—045122(by HDFC BANK), dated 10th Sept 2010 with DFO, Bonai MS-CAMPA account to undertake activities both inside the project area & project impact area.*** ***However, the project is carrying out different measures towards protection of wild animals***	***Being followed on regular basis as explained.*** ***Further, Proposed activities towards environmental measures will be implemented soon after grant of Environmental Clearance.***

	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 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) Vertiver 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 afforestation and wildlife management. Further, additional fund, if required can be sought from	***i.e. awareness program among local and staff members etc., engagement of the fire watchers, van sahayaks etc.*** ***Karo-Karampada elephant corridor is above 18.0 KM from the mine lease boundary. The distance map is given in Figure no. 4-20 in Chapter-IV.*** ***6502 saplings of native species have been planted during the year 2017-18 with cumulative plantation 153803 no's covering an area over 40.971 ha within the mining lease in consultation with the Forest Department, Govt. of Odisha.*** ***Dump area of about 26,492 m2 is covered with coir mat with dump slopes are applied with natural grass seedlings for dump stabilization. In addition, 5231 no's saplings, 527 no's vertiver and sue babul seedlings and 13145 m2 grass patching have been made over the dump slope to control erosion and surface run off.*** ***We will abide by the suggestion of State Forest & Wildlife Department in this aspect.***	

	DMF. **Responsibility: Individual Mine Lease Holders and State Forest & Wildlife Department.**		
27	**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, roads, 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 outies 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 "SamagraVikas" 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 Pradhan 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 Individual Mine Lease Holders.**	***Till 2017-18 AMTC has spent more than Rs.66.76 crores for infrastructure facilities like education, medical, roads, safe drinking water, sanitation, employment, skill development under CSR activities.*** ***Further Rs 7.55 Crore has budgeted for next 5 year under CER.*** ***Apart from that AMTC has given Rs. 75.41 Crores till September 2018-19 under District Mineral Foundation (DMF).*** ***There is no such Resettlement and Rehabilitation as there is no Land outies and land losers/affected people.*** ***We will extend our support to District Administration towards growth of education, medical and developing skills in the people of the region.***	***Being followed on regular basis as explained.*** ***Further, Proposed activities towards environmental measures will be implemented soon after grant of Environmental Clearance.***
28	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	***We will abide by the suggested ore transport mode (SOTM) by State Govt. in future.*** ***As NH-215 passes through the lease area and widened with blacktopped and under four-lanning, so the***	***Construction of concrete road from the exit gate to inside the mine already completed.*** ***Maintenance of road & monitoring of dust is a continuous practice by***

	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, PM10 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.**	***transportation is free from dust.*** ***The vehicles carrying the loaded materials are being released with tarpaulins covers and we are ensuring no spillage of ore/dust takes place on the transportation road.*** ***Air quality monitoring is being done near the mineral transport road in regular basis.***	***lease holder.*** ***Further we will abide by the guidelines formed by State Govt. in regard to SOTM***
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 mineral 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)**	***Workers engaged in Operations are provided with earplugs / muffs. Besides this, acoustic enclosures are provided for all machines operating within the mines. The noise level is being monitored by Noise Level Meter; the results reveal that the parameter is well within the prescribed norms*** ***Initial Medical Examination &Periodical Medical Examination of the workers engaged in the project are being carried periodically and records are maintained. This is being carried in compliance to Mines Act, 1952 & Rules 1956 and amendments there to.*** ***During 2017-18, there was a total of 10 nos. of employees under gone for IME and 24 nos. for PME medical examinations.*** ***The occupational health surveillance shows that there no occurrence of***	***Being followed on regular basis as explained.*** ***Further, Proposed activities towards environmental measures will be implemented soon after grant of Environmental Clearance.***

		any kind of occupational health diseases. ***A medical dispensary with full time Doctor has been appointed at camp area for the health check-up of employees and also the locals.***	
30	Reporting of Environmental Sustainability Achievement: All the mines should prepare annual environmental sustainability report (ESR), highlighting the efforts made towards environmental protection with respect to different environmental components vis-à-vis production performance of the mine on monthly basis. The data collected as per EC and 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.**	***As per the "Star Rating Format" formulated by the Ministry of Mines AMTC have self-rating our self as 4 star.*** ***Environmental Sustainable report is being prepared in yearly basis highlighting the efforts made towards environmental protection.***	***This project is being followed the star ratting mechanism formulated by the Ministry of Mines along the Environmental Sustainable reporting & rated as 4 star in the recent past evaluated by IBM.***
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.	***Presently online air quality monitoring system has established in some of the mines core zone area and also in transportation route under guidance of SPCB.*** ***On the basis of gathered data R&D work will be done by Govt. Authorities.*** ***Regarding installment of Online AAQ monitoring station within the lease area, we are in the process to install it at the earliest.*** ***Existing 215 is passing through the lease and exit gate of mine working area is connecting the same.***	***Online monitoring station within the lease area will be established within 2 months.*** ***Work order issued Swan Environmental Pvt Ltd., Hyderabad for supply & installation*** ***For technical studies we will extend our support as per the instruction from Authorities.***

	<table><tr><th>Sr. No.</th><th>Study Component/ Action Plan</th><th>Responsibility</th><th>Monitoring and Reporting Time Frame (Approx.)</th></tr><tr><td>1.</td><td>Environmental Quality Monitoring with respect to Air, Water, Noise and Soil Quality in each region (Joda, Koira and Barajuda/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.</td><td>SPCB</td><td>Continuous Annually</td></tr><tr><td></td><td>Installation of online ambient air quality monitor for PM10, PM2.5, SOx and NOx within the mine having more than 3 MTPA EC Capacity</td><td>Respective Mine Lease Holders</td><td>Continuous Annually</td></tr><tr><td></td><td>Installation of online ambient air quality monitor for PM10, PM2.5, SOx and NOx in the Joda and Koira Region (total 11 locations)</td><td>SPCB</td><td>Continuous Annually</td></tr><tr><td>2.</td><td>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</td><td>State Forest & Wildlife Dept.</td><td>Annually in mining zone and once in 3 years in the region</td></tr><tr><td>3</td><td>Socio-economic study incorporating 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.</td><td>Respective District Administration</td><td>Annually</td></tr><tr><td>4</td><td>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.</td><td>SPCB</td><td>Once in 2 years</td></tr><tr><td>5</td><td>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.</td><td>Dept. of Steel & Mines</td><td>12 months for road network and 5-7 years for rail network</td></tr><tr><td>6</td><td>Construction and maintenance of dust free roads from respective mine to the main road.</td><td>Respective Mine Lease Holders</td><td>Continuous 6 months</td></tr><tr><td>7</td><td>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).</td><td>Dept. of Steel & Mines</td><td>Continuous 6 months</td></tr><tr><td>8</td><td>Assessment of land use/ land cover changes in each of the regions, with particular focus on mining areas, afforestation activities, variation in flow path of various water bodies etc. using remote sensing data</td><td>ORSAC</td><td>Annually</td></tr><tr><td>9</td><td>R&D Studies for utilization of low-grade iron ore</td><td>Dept. of Steel & Mines through R&D / Academic Institutes</td><td>Up to 45% by 2020 and up to 40% by 2025</td></tr></table> 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 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 Koia 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.	***We are ensuring the dust free road on the stretch of the road passes through the mine lease area.*** ***We will extend support towards monitoring of all environmental parameters by SPCB, Flora & Fauna study by State Forest & Wildlife Dept.,Socio-economic study by District Administration, Hydrogeological study by CGWB, Traffic study by CRRI, Remote sensing study by ORSAC and R&D studies for utilization of low grade iron ore by Dept. of Steel & Mines through academic institutes.*** ***For the proposed expansion, towards EIA/EMP study a 3 months baseline data has been conducted during December 2017 to February-2018.***	
32	Institutional Mechanism for Implementation of Environmentally Sustainable Mining: The present study is not a one-time study, but a process to ensure environmentally sustainable	***We will extend our support in every aspect towards environmentally sustainable development***	***Proposed proposals towards environmental measures, socio-economic development,***

	mining activities in the region on long term basis. Looking into the large-scale mining activities and long term perspective for mining vis-à-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 & Mines, with members from IBM, GSI, OSPCB, MoEF&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 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,**	***plan for economic growth in mining sector as well as for improvement in quality of life of the people of the region inline to State Govt. policy.***	***and technical studies given EIA/EMP will be implemented within 3 months after grant of Environmental Clearance.***

	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.		

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