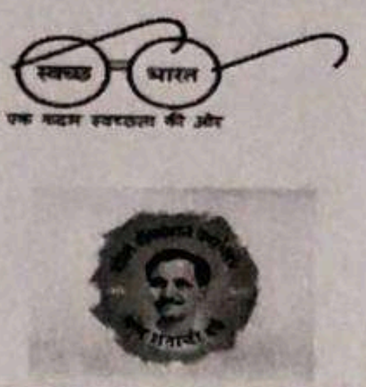
एक महारत्न कंपनी
A Maharatna Company

CENTRAL COALFIELDS LIMITED
(Govt. of India Undertaking)
A miniratna Cat-I Company
Darbhanga House, Ranchi-834001



Letter no: GM/HoD(E&F)/2021/143

Date: 09.02.2021

To,

Member Secretary (Coal Mining)
Ministry of Environment Forest and Climate Change,
Indira Paryavaran Bhawan
3rd Floor, Vayu Wing, Jor Bagh Road
New Delhi-03

Subject: Submission of reply to the ADS in respect of Amrapali Expansion Opencast Coal Mine (25 MTPA) Phase-1– Reg.

Ref: 1) Proposal No: IA/JH/CMIN/123390/2019

Respected Sir,

This has reference to the above subject. The reply to the ADS of the proposal is being submitted herewith for your kind consideration.

It is requested to accept the submission and consider the proposal in the ensuing EAC (Coal) meeting scheduled on 11.02.2021.

Enclosure: As above

Yours faithfully,

9/2/21

GM/HoD (E&F)
Central Coalfields Limited
Ranchi

Reply to the Additional Details Sought by the

EAC (Coal Mining Sector)

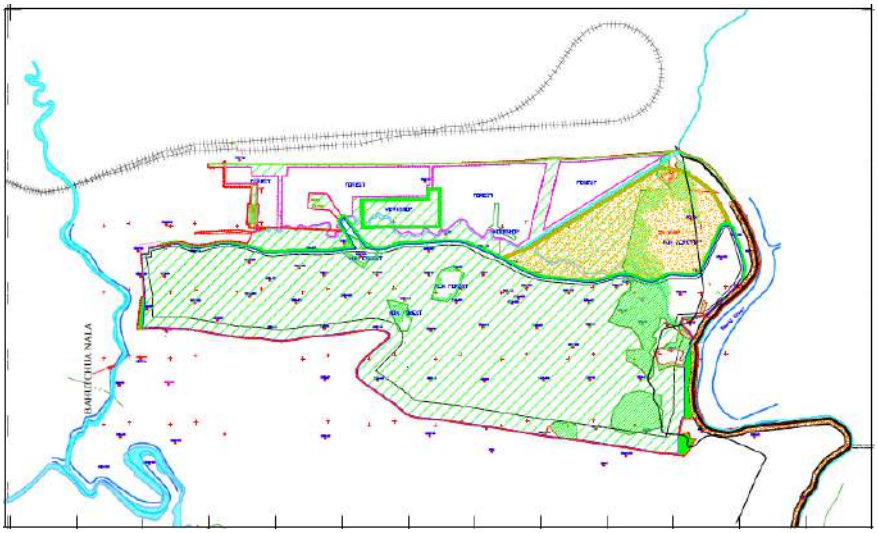
in the 7th Meeting Held on 29.01.2021

In respect of

AMRAPALI EXPANSION OCP (PHASE-I)

(Magadh-Amrapali Area)
(Project Area:619.87 Ha
Capacity: 25 MTPA)

CENTRAL COALFIELDS LIMITED
(A Subsidiary of Coal India Limited)



February 2021

Prepared by

Central Mine Planning and Design Institute Limited
Gondwana Place, Kanke Road, Ranchi
CMPDI/EIA/CCL/2020-21/Dec/3120195/0

Reply to the additional details sought (ADS) for Amrapali Expansion OCP (Phase-I)

SN	Additional Details Sought	Submission of Project
1	PP shall submit compliance of EC conditions, which are still non-complied with proof/ photograph.	The Compliance & action taken report for observation raised by RO, MoEF&CC during his Inspection on 21.12.2020 for EC (14.4) in respect of Amrapali OCP, Amrapali-Chandragupta Area, CCL is enclosed herewith as **Enclosure-01.**
2	The PP should come up with proposal/installation of continuous air quality monitoring stations with photographs. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs, which analyse the samples.	The procurement of CAAQMS system at Project Office of Amrapali OCP is under progress from GeM portal of Govt. of India. The proof is enclosed herewith as **Enclosure-02**. Continuous PM_{10} analyser has been installed at Shivpur Railway Siding of Amrapali OCP. The copy of supply order & photographs are given in **Enclosure-03.** The original test reports and certificates of the labs, which analyse the samples shall be submitted to Regional office of MoEF&CC & JSPCB.
3	PP shall justify for considering two different emission factors source for AQIP modelling and further modelling has been conducted only for normative production capacity	AQIP modeling was carried out for the peak capacity scenario of 25 MTPA. Emission factors used in this study have been derived from emission factor S & T study of CMPDI & AP42 of USEPA.
4	PP shall propose the measures to be taken for reduction of air pollution due to internal and external transportation of mine.	The proposed & existing measures for reduction of air pollution due to internal and external transportation of mine is enclosed as **Enclosure-04.**
5	PP shall submit the specific mitigative measures for Dudhmatia Nala flow through the mining leasehold area. Detailed diversion plan along with its impact on Barki river shall be provide with allocated fund and timeline and likely Impact of mining on Chundru, Garhi river shall be submitted.	The detailed diversion plan of Dudhmatia Nala along with impact on nearby streams and specific mitigative measures is provided at **Enclosure-05.**
6	PP should submit proper adequate response to public hearing issues with financial commitment and submit year wise breakup and timeline for Action Plan for addressing the issues.	The detailed response to issues as discussed during Public Hearing along with financial commitment and year wise breakup is enclosed as **Enclosure-06**.
7	Fresh socio-economic study and study on flora and fauna shall be submitted since it is older than 3 years.	Socio-economic and flora and fauna study were carried out in Pre monsoon 2017. The data was validated after field survey by QCI accredited Functional Area Experts (FAE) of CMPDIL, Ranchi in pre monsoon 2020 ie., during COVID-19 lockdown period.

		This Socio economic and Flora Fauna data/status which was prepared after field survey during Pre monsoon 2020 was presented in the EIA EMP report after incorporating latest data/observations.
8	The PP should submit the number of saplings to be planted, area to be covered under afforestation & green belt, location of plantation, target for survival rate and budget earmarked for the afforestation & green belt development. In addition to this PP should show on a surface plan (5-year interval for life of mine) of suitable scale the area to be covered under afforestation & green belt clearly mentioning the latitude and longitude of the area to be covered during each 5 years. The capital and recurring expenditure to be incurred needs to be submitted. Plantation plan should be prepared in such a way that 80% of the plantation to be carried out in first 5 years and for the remaining years the proposal for gap filling. The seedling of height not less than 2 meters to be selected and accordingly cost of plantation needs to be decided. In addition to this plantation in the safety zone at lease boundary the plantation should be completed within 2 years only.	The plantation development plan is enclosed as **Enclosure-07** which indicates number of saplings to be planted, area to be covered under afforestation & green belt, location of plantation, target for survival rate and budget earmarked for the afforestation & green belt development. It also contains the afforestation & green belt to be developed within the project life & during mine closure period of the mine. As the project life of Phase-1 of the mine is 4 years, the direction of EAC that 80% of the plantation to be carried out in first 5 years & plantation in the safety zone at lease boundary the plantation within 2 years shall be completed.
9	PP to submit R & R in respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government.	As desired the demographic analysis of sample population along with action plan for R & R (including SC and ST) is enclosed at **Enclosure-08.**
10	Impact on nearby agricultural land and on biological Environment. Proper biological management plan needs to be prepared.	The report detailing the impact on nearby agricultural land and on biological Environment along with biological management plan is enclosed as **Enclosure-09**
11	Comprehensive Plan for supplying/ distribution with piped water to the nearby habitation in villages/	A report on existing & proposed plan for supplying & distribution of treated water is enclosed as **Enclosure-10**

	settlements (particularly for habitation coming under zone of influence).	
12	PP should submit the quantity of surface or ground water to be used for this project. The complete water balance cycle need to be submitted. In addition to this PP should submit a detailed plan for rainwater harvesting measures to be taken.	The complete water balance of Amrapali OCP is provided and details of existing & proposed rainwater harvesting measures undertaken at **Enclosure-11** along with source of water. No Objection Certificate (NOC) For Ground Water Abstraction of 4,220 m3/day has been issued and is enclosed as **Enclosure-12.**
13	PP shall state the reason of high variation (% variation) of proposed production capacity between Normative and peak values.	The expansion project report of Amrapali OCP has been approved for a rated capacity of 25 MTY with peak capacity of 35 MTY (40 % above the normative capacity) by CIL Board. However, the mining plan & mine closure plan has been approved by CCL Board for a capacity of 25 MTPA, and the proposal submitted to MoEF&CC is for the rated capacity of 25 MTPA only. The approval of mining Plan & Mine closure Plan is enclosed as **Enclosure-13.**
14	Plan of OB Dumping and rehandling and management of enhance capacity to be given with proper layout	The detailed plan & layout of OB dumping and rehandling along with management of enhance capacity is enclosed as **Enclosure-14.**
15	Plan for coal transportation from pithead to Amrapali Railway Siding through belt conveyer to be completed in 2 years.	As directed, it is proposed to complete the work of Amrapali Railway Siding through belt conveyer within the stipulated timeline of 2 years. The work order of construction of Amrapali CHP has been awarded to M/s Larsen & Turbo Ltd on 31.12.2020 & application of diversion of Forestland has also been submitted to MoEF&CC on 12.10.2018 for construction of Amrapali Railway Siding. The work of construction of railway siding has been awarded to M/s RITES Ltd. The proposed plan & alignment of Amrapali Railway Siding is enclosed as **Enclosure-15.**
16	PP shall submit impact of blasting with adequate safeguard on nearby villages	The ground vibration monitoring reports for the month of January is enclosed as **Enclosure-16.** It can be seen from the reports that the ground vibration & measured value of PPV are within permissible limits. The safeguards for minimizing the impact of blasting & vibration on nearby habitation are enclosed as **Enclosure-17.**
17	PP shall submit additional provision i.e	The additional provisions for additional EMP

	capital and recurring cost by proposing additional EMP measures including dust suppression as suggested by Ministry's Regional office	measures including dust suppression as suggested by Ministry's Regional office is provided as **Enclosure-18**.

ENCLOSURE 01

Compliance & action taken report for observation raised by RO, MoEF&CC during his Inspection on 21.12.2020 for EC (14.4) in respect of Amrapali OCP

Condition no	Observations raised by RO, MoEF&CC for EC (14.4 MTPA)	Status of compliance & action taken report
vi	Some of fixed water sprinklers inline (at the weigh bridge area) were not operational. Project authorities informed that due to pipe breakage some sprinklers were non operational. It was instructed to make arrangements so that water sprinklers remain operational regularly and it should be rectified as soon as some problems are encountered there. Fixed water sprinklers are also required in main coal dump area, haul roads adjacent to the coal dumps/weigh bridges, haul road from mine to coal dumps/stocks other haul roads on which HEMM/trucks move frequently.	At present the following mitigation measures are being undertaken for control of dust & other fugitive emissions: a. The fixed water sprinkling system over 1.2 Km length has been constructed at Ursu Checkpost and is kept functional on a regular basis.  b. 03 number of departmental water sprinklers of 28 KL capacity deployed for water sprinkling. In addition, there are 13 contractual water sprinklers of 12 KL & 20 KL capacities deployed with an average of 9 trips/tanker/day. c. Fixed sprinklers (for 1.3 km) at estimated cost of Rs. 90 lakh will be installed in Haul Road by May 2021. d. Fixed sprinklers (for 1.30 km) on coal transportation roads will be installed by June 2021. e. Fog canon type mist sprinkler at an estimated cost of Rs. 80 lakh will be installed by July 2021.
ix	Some green belt development could be seen in the project. However, thick green belt of adequate width at the final boundary in the downward direction has not been developed yet by Project authorities to mitigate/check the dust pollution.	Around 25,134 plants have been planted for raising of Green Belt / Block plantation. Details of plantation is given below:- a. 13000 plants (approx.) on Binglat OB dump & 1000 plants (approx.) near Ambey & Mahalaxmi camp.

b. 150 plants (approx.) at Govt. School Honhe & St. Joseph School Mander.
c. 1200 plants around NBCC road in 3 Ha area by State Forest Department.
d. Plantation of 850 numbers of native species along the Haul road of Amrapali project.

e. 934 nos. of drought hardy native species have been planted at Haul road near Dudhmatia nallah in mine.
f. 8000 saplings (2000 saplings of Bamboo on slope of Dudhmatia nallah, 3000 saplings on North-East side of Binglat O/B dump , west side of O/B dump & 1000 numbers of fruit species at PO office, VTC, Store & other infra.) planted in Monsoon 2020.

g. In Monsoon 2020, Seed ball plantation carried out over Binglat OB dump and top soil stockyard near Honhe. Work is completed at

		Binglat OB dump area. h. About 5000 saplings of multi species will be planted during monsoon 2021 for development of Green Belt in and around the mine site. During monsoon 2021, 23.42 Ha of plantation will be raised over backfilled area, industrial infrastructure, road & green belts. During monsoon 2022, 17.36 Ha. & during monsoon-2023 50 Ha of plantation will be raised over backfilled area, industrial infrastructure, road & green belts.
x	Water was withdrawn from Dhudhmatia nallah for water sprinkling in the project by water tankers. However, project authorities did not submit surface water / river water withdrawal permission from concerned department.	Mine sump has been maintained which is used for sprinkling purpose & filling points have been established through pipes & pumps. No Objection Certificate (NOC) For Ground Water Abstraction of 4,220 m3/day has been issued on 05.02.2021 and it is also being submitted to MoEF&CC.
xi, a(v) & c (i)	Groundwater was withdrawn for water utilization for water sprinkling, green belt development, etc. at the Shivpur railway siding area. However, project authorities did not submit any permission/approvals from competent authority (CGWA, etc.) for such Groundwater withdrawal there.	No Objection Certificate (NOC) For Ground Water Abstraction of 4,220 m3/day for Amrapali OCP has been issued on 05.02.2021 and it is also being submitted to MoEF&CC.
xiv & f(v)	Grassing and vegetation have been developed at many places on Bingalat O/B dump. However there are still many places on the Bingalat O/B dump where grassing and vegetation has not been developed. Grassing and vegetation should be developed urgently on the sides/slopes of O/B dump facing Dhudhmatia nala and on remaining portions also.	Grass matting using Guinea grass, Charabadam and Johnson grass have been done on the barren portion of Honhe O/B dump.

		 In Monsoon 2020, Seed ball plantation has been done over Binglat OB dump Work is completed at Binglat OB dump area. 
xv & xxviii: Efforts made for compliance. Work in progress. Project proponent has submitted Action taken report-dated 16.12.20. Efforts have been made for compliance of many EC (old) conditions. However, there still remains some partially complied conditions as given below':		
a	Catch drain and siltation ponds around Honhe dump	Catch drains have been made all around the O/B dumps &

	has been made. However, catch drains and siltation pond (in the remaining portions) around Binglat O/B dump (especially adjacent to Dhudhmatia nala) has to be made. Similarly Catch drains & siltation ponds around all coal dumps/ heaps /stocks needs to be constructed-Partially complied. (Specific condition iv of earlier EC).	periodic de-siltation has been done to prevent siltation.  Catch drain has been constructed between Coal stock & Dhudhmatia nallah to prevent from runoff. It is proposed to construct 1.5 km Toe wall and garland drain along OB dump, Top soil Dump at an tentative cost of Rs 60 Lakhs.
b	Retaining wall made around Honhe O/B dump. Retaining wall around Binglat O/B dump especially facing Dhudhmatia nala needs to be constructed-Being complied but further action needed. (Specific condition v of earlier EC).	Retaining walls constructed around the sides of O/B dump where its final alignment has final shape. Periodic de-siltation of catch drain facing Dudhmatia nallah & other places is being followed.  It is proposed to construct 1.5 km Toe wall and garland drain along OB dump, Top soil Dump at an tentative cost of Rs 60 Lakhs.
c	There have been improvements in green belt development. However, Avenue plantation on both side of haul road and green belt around bunker and surrounding area for coal stock has not been developed as per EIA/EMP report: Partially complied, efforts made for compliance but work in progress(Specific condition iii & vi of earlier EC).	Around 25,134 plants have been planted for raising of Green Belt / Block plantation. Out of which 934 native species have been planted in 2019 on Haul road as Avenue plantation. In the coming year's plantation will be done along the villages and transportation route. During monsoon 2021, 23.42 Ha of plantation will be raised over backfilled area, industrial infrastructure, road & green belts. During monsoon 2022, 17.36 Ha & during monsoon-2023 50 Ha

		of plantation will be raised over backfilled area, industrial infrastructure, road & green belts.
d	Mitigative measures for preventing pollution in Dudhmatia nala (that flows in river Barki) needs to be taken- Partially complied, action taken for compliance. (Specific condition xiii of earlier EC).	Around Dudhmatia nallah, 934 native species have been planted in 2019 on Haul road as Avenue plantation.On the slope of Dhudhmatia nallah 2000 Bamboo plants have been Planted in 2020. It is further proposed that a. Garland drain, all along in between the OB dump and diverted nala, will be provided to check the run-off coming directly from embankment. b. Before monsoon bed of channel should be cleaned with proper gradient. c. Plantation will be developed all along the banks of Nala.
e	Project proponent has submitted health check up report of around 5 K. M radius of Magadh-Amrapali area for five years, from 2013-2018. Comparative analysis of the same has not been submitted by PP.	Regular Health check-up camps conducted in Project Affected Villages under CSR & CER schemes. A hospital is also proposed at Amrapali OCP at an estimated cost of Rs. 6.78 Crores, which will further ensure better health facilities to residents of the region. Work order has been placed for this work 0n 03.02.2021.
f	Working hours of water tankers remain less than satisfactory. Fixed water should be provided for main haul roads dust suppression. Being complied but further action needed. (General condition vi of earlier EC).	At present the following mitigation measures are being undertaken for control of dust & other fugitive emissions: a. The fixed water sprinkling system over 1.2 Km length has been constructed at Ursu Checkpost and is kept functional on a regular basis.  b. 03 number of departmental water sprinklers of 28 KL capacity deployed for water sprinkling. In addition, there

		are 13 contractual water sprinklers of 12 KL & 20 KL capacities deployed with an average of 9 trips/tanker/day. c. Fixed sprinklers (for 1.3 km) at estimated cost of Rs. 90 lakh will be installed in Haul Road by May 2021. d. Fixed sprinklers (for 1.30 km) on coal transportation roads will be installed by June 2021. Fog canon type mist sprinkler at an estimated cost of Rs. 80 lakh will be installed by July 2021.
xvi	Action being taken for compliance but more efforts needed for compliance of this EC condition till March 2022. More plantations need to be done along the villages and transportation route for compliance of this EC condition.	Around 25,134 plants have been planted for raising of Green Belt / Block plantation. Out of which 934 native species have been planted in 2019 on Haul road as Avenue plantation. In the coming year's plantation will be done along the villages and transportation route. During monsoon 2021, 23.42 Ha of plantation will be raised over backfilled area, industrial infrastructure, road & green belts. During monsoon 2022, 17.36 Ha & during monsoon-2023 50 Ha of plantation will be raised over backfilled area, industrial infrastructure, road & green belts.
xvii & I (i)	Activity wise expenditure (on items related to CER) i.e. details of actual expenditure incurred on CER has not been submitted to this office	The proposed CER activities are given below: **1. Control of Air Pollution** a). Plantation programme in villages (Ursu, Pachra, Kumrang) situated at close proximity of the project. Dense Plantation will be raised along the village boundary and in available spaces in consultation with villagers:- Rs. 100 Lakhs. b). Wind Barrier/Curtains will be installed at strategic locations along the village boundaries to arrest dust:-Rs. 50 Lakhs **2.Repair of households** a). Financial provisioning for carrying out repairs, strengthening work of houses in adjoining villages:- Rs. 50 Lakhs. **3. Hospital and Healthcare:-** Health Camps in nearby villages:- Rs. 50 lakhs. **4.Education & Skill Development: -** Further, skill development trainings like automobile repairing, food processing, motor winding, driving, electrician, tailoring, computers etc will be conducted under CER:- Rs 50 Lakhs. **Total: - Rs. 300 Lakhs**

		The actual expenditure shall be submitted to RO MoEF&CC along with six monthly compliance report after ending of financial year.
xxvii	As per the plan submitted, Honhe External OB dump is within 100m distance from Bahut Chuha nala. Catch drains and siltation ponds have been made around Honhe OB dump to prevent any silt flowing in Bahut Chuha nala.	The following action has already been undertaken for prevention of pollution: a. Construction of quarry boulder retaining wall at Honhe OB dump is completed with garland drain of 2 Km. b. Catch drain of 2 Km length & 02 nos of siltation ponds constructed around Honhe OB Dump. c. 3 Sedimentation tanks have been de-silted for its proper functioning.
ii & (a) iv	PP has also reported that copy of application made for CTE of 14.4MTPA vide no:-7811934 dated 11.03.2020 has been submitted to JSPCB. It implies project proponent has neither received CTE for-14.4MTPA (Peak) production nor they have valid CTO for14.4MTPA production till date.	a. CTE issued for 14.4 MTPA vide no: JSPCB/HO/RNC/CTE-7811934/2021/7 dated: 08.01.2021. b. CTO issued vide no: JSPCB/HO/RNC/CTO-6645615/2020/1408 dated 01.09.2020 for 12 MTPA, valid till 30.06.2021. c. CTO issued for 14.4 MTPA vide no: JSPCB/HO/RNC/CTO-7819614/2020/712 dated: 26.03.2020 till 30.09.2020. Renewal under process at JSPCB.
iii	Tarpaulin covering was done on the coal transportation trucks. However, there was coal spillage on coal transportation routes. It may be due to improper covering, loading of coal till the top of truck, etc. It was instructed that a free board of minimum 5 cm in all loaded vehicles/trucks along with proper covering with impervious material to prevent escape of times should be followed for all coal transportation trucks.	Instruction given to Security Check post and transporters for strict compliance for proper loading and covering of trucks. 

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It is also proposed to use 2 numbers Road Sweeping Machines on CTR at an cost of Rs. 150 Lakhs & PCC Topping of Coal transportation road along with catch drains for a length of 5 Km at an estimated cost of Rs 900 Lakhs.</td>
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<td>vii, xii, xxi & h(ii)</td>
<td>PME of contractual workers should also be submitted.</td>
<td>All employees in mine undergo medical examination as per rules. The details of Initial Medical Examination (IME) & Periodic Medical Examination (PME) of workers is given below:
<table>
<tr><th>Year</th><th>IME Departmental</th><th>IME Contractual</th><th>PME Departmental</th></tr>
<tr><td>2015</td><td>122</td><td>210</td><td>11</td></tr>
<tr><td>2016</td><td>15</td><td>47</td><td>21</td></tr>
<tr><td>2017</td><td>21</td><td>126</td><td>21</td></tr>
<tr><td>2018</td><td>11</td><td>384</td><td>26</td></tr>
<tr><td>2019</td><td>07</td><td>192</td><td>78</td></tr>
<tr><td>2020</td><td>01</td><td>105</td><td>53</td></tr>
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<td>viii</td>
<td>Project proponent should submit skill development activities undertaken exclusively at Amrapali OCP.</td>
<td>Skill development activities undertaken exclusively at Amrapali OCP are given below-

1.Amrapali project has procured 100 sewing machines for distribution to the Panchayats.
2.PAPs were selected for CETI (Mining and Sirdar training) and BTTI (electrician and welder training). Details are as under-
<table>
<tr><th>Name of training</th><th>No. of PAPs</th></tr>
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		<table><tr><td>CETI (Mining and Sirdar training)</td><td>10</td></tr><tr><td>BTTI (electrician and welder training)</td><td>36</td></tr></table>
xviii	Project Proponent (PP) has submitted a copy of blasting permission obtained from DGMS (no.Ranchi area/825-27). Permission obtained was valid upto three years from the date of issue of letter but in the submitted copy date of issue of letter is not legible.	Earlier when blasting was done within danger zone of 300 meters blasting permission was obtained vide No S-29020/02/2016-RR/434; dated 24.02.2017 which was valid till 23.02.2019. The danger zone as per this permission was 300 meters. There are no permanent buildings or structure of permanent nature not belonging to owner was located in the danger zone of blasting i.e. within 500m from the site of blasting. As mine is now advancing towards habitation (Kumrang kala and Kumarang khurd) application for blasting permission keeping danger zone of 500 made on 22.12.2020 to DGMS.
xxii, (h) v, (j) vi	Some of the stipulations of the OM that are relevant to the project are yet to be complied completely: Inadequate provision for prevention of coal dust and OB silt material for into Dhudhmatia nala, Absence of permanent water sprinklers in main haulage road in mine, etc.	Around Dudhmatia nallah, 934 native species have been planted in 2019 on Haul road as Avenue plantation.On the slope of Dhudhmatia nallah 2000 Bamboo plants have been Planted in 2020. It is further proposed that a. Garland drain, all along in between the OB dump and diverted nala, will be provided to check the run-off coming directly from embankment. b. Before monsoon bed of channel should be cleaned with proper gradient. c. Plantation will be developed all along the banks of Nala. At present the following mitigation measures are being undertaken for control of dust & other fugitive emissions: a. The fixed water sprinkling system over 1.2 Km length has been constructed at Ursu Checkpost and is kept functional on a regular basis.

		 b. 03 number of departmental water sprinklers of 28 KL capacity deployed for water sprinkling. In addition, there are 13 contractual water sprinklers of 12 KL & 20 KL capacities deployed with an average of 9 trips/tanker/day. c. Fixed sprinklers (for 1.3 km) at estimated cost of Rs. 90 lakh will be installed in Haul Road by May 2021. d. Fixed sprinklers (for 1.30 km) on coal transportation roads will be installed by June 2021. Fog canon type mist sprinkler at an estimated cost of Rs. 80 lakh will be installed by July 2021.
xxiii	From the submitted data it is not clear whether the noise monitoring has been done at night or not.	Noise sampling during nighttime will be undertaken during quarter ending March 2021 (February and March months) and report will be submitted to RO MoEF&CC with six monthly compliance report.
xxiv & (g)i	Project Proponent has submitted a copy of letter no. HOD(E&F)/20/1130 dated 18/02/2020 submitted to DFO, Chatra (South). In the submitted letter it was mentioned that application for EC has been made for 16.8 MTPA. However, in the preliminary conservation plan prepared by Institute of Forest Productivity, Ranchi targeted production of Amrapali OCP has been mentioned as 12.0 MTY. Project Proponent should clarify the above anomaly.	The conservation plan for Amrapali OCP is same as the area of the project remains same. Only the capacity of project has increased from 12 MTY to 16.8 MTY with reduction in project area in case of Amrapali OCP (16.8 MTY).
a (vi)	Used oil drums were kept haphazardly without any cover/shade i.e in open space with some oil spilled on ground.	As directed, necessary arrangement for proper housekeeping and storage of burnt oil dumps has been carried out at site.

a (iii)	Project proponent (PP) should follow up and make efforts to get the site conservation plan approved by competent authority. Remaining compliance same as specific condition xxiv.	The conservation Plan for schedule-I species for Amrapali OCP has been prepared and submitted to DFO, Chatra South on 20.01.2021.
b (iii) & (vi)	Tarpaulin covering was done on the coal transportation truck. However there was coal spillage on coal transportation routes. It may be due to improper covering, load rug of coal til I the top of truck, etc. lt was instructed that a free board of minimum 5 cm in all loaded vehicles/trucks along with proper covering with impervious material to prevent escape of times should be followed for all coal transportation trucks. Some of fixed water sprinklers in line were not operational. Project authorities informed that due to pipe breakage some sprinklers were non operational. It was instructed to make arrangements so that water sprinklers remain operational regularly and it should be rectified as soon as some problems are encountered there. Fixed water sprinklers are also required in main coal dump area, haul roads adjacent to the coal dumps/weighbridges; haul road from mine to coal dumps/stocks other haul roads on which HEMM/trucks more frequently. Grader/scraper was used for leveling, cleaning of road between Amrapali Mine project and Shivpur Railway siding. But coal dust/debris has been pushed on both sides of roads. Water tankers were observed sprinkling water on the coal transportation road to Amrapali siding but it did not seem sufficient. More water tankers should be deployed on the route for water sprinkling. Road sweeping machines can also be	Instruction given to Security Check post and transporters for strict compliance for proper loading and covering of trucks.  At present the following mitigation measures are being undertaken for control of dust & other fugitive emissions: a. The fixed water sprinkling system over 1.2 Km length has been constructed at Ursu Checkpost and is kept functional on a regular basis.

	deployed. Steps should be taken to ensure that there is no coal spillage on the road because there were village dwellings/habitations adjacent to that road who would be adversely affected by the coal dust emissions there. Surface miner was observed in the mine that was utilized for coal breakage/excavation. However, a coal dust emission was observed during the operation of surface miner. Also during loading of coal by loaders into trucks there was a lot of coal dust emissions. Even though water tankers were utilized for wetting of coal there was a coal dust emission during coal loading.	 b. 03 number of departmental water sprinklers of 28 KL capacity deployed for water sprinkling. In addition, there are 13 contractual water sprinklers of 12 KL & 20 KL capacities deployed with an average of 9 trips/tanker/day. c. Fixed sprinklers (for 1.30 km) at estimated cost of Rs. 90 lakh will be installed in Haul Road by May 2021 & Fixed sprinklers (for 1.30 km) on coal transportation roads will be installed by June 2021. d. Fog canon type mist sprinkler at an estimated cost of Rs. 80 lakh will be installed by July 2021.
b (i) & (ii)	Heavy metals monitoring data of Hg, Cd, Cr has not been submitted. Spontaneous combustion was observed at one place in O/B dump. It was instructed to eliminate spontaneous combustion in the mine project area.	Heavy metals as per NAAQS – As, Pb, and Ni are routinely monitored. The analysis report of additional metals - Hg, Cd, Cr will be carried out & and report will be submitted to RO MoEF&CC with six monthly compliance report.
b (iv)	It is mentioned in the addendum EIA/EMP of Amrapali OCP (Page No 1) that coal is being transported by trucks to Shivpur rai1way siding which is at a distance of 07 km from project boundary. However in the copy/pages of the mining plan submitted by PP there is no mention of coal transportation route nor any drawing/plate attached showing the route.	The Mining Plan envisaged transportation of coal from Amrapali to Balumath Railway Siding which is about 25 km from the project. However, with the commissioning of Shivpur railway siding that is at a distance of 5 km the coal is being dispatched from a considerable lesser distance vis-à-vis Balumath Railway Siding. The same has been been given in the EIA/EMP report.
c (i)	PP should submit the Effluent water monitoring data of workshop effluent.	Water is recycled in the workshop effluent treatment unit. Its quality will be monitored and reported for Quarter ending-March, 2021 to RO, MoEF&CC.
c(vi)	Action being taken for compliance but still partially	Around Dudhmatia nallah, 934 native species have been planted

	complied. Overburden material was observed in the slopes facing Dhudhmatia nala at many places. It was instructed to develop grassing and vegetation urgently on the slopes facing Dhudhmatia nala. Catch drains were made adjacent to the coal dump in such a way that there was coal transportation road between coal dump and catch drains . Depth and width of catch drains near coal dump was not sufficient. Since therc were no siltation ponds attached with those catch drains there were chances that coal dust water wotild flow to Dhudhmatia nala adjacent to those drains. Also, there were open places between drains for vehicle movement and coal dust would flow from there to Dhudhmatia nala. It was instructed to project authorities to make full proof arrangement, Catch drains of appropriate depth and width, siltation ponds etc. to ensure that no coal dust flows into the Dhudhmatia nala. Catch drain and siltation pond was being constructed on one side of one of the coal dump on east side of mine pit. It was instructed to increase the depth of drains there and build siltation ponds also. At least four-coal dumps/coal stockpile were observed in the project. Project authorities informed that the coal dump on the east side of mine pit would be discontinued very soon and no more coal would be stocked there. For the other coal stockpiles project authorities informed that due to weighbridge coal stocks accumulates and look 1 ice coal stockpile. It was instructed to construct catch drains and siltation ponds around these coal stocks/dumps also. Project authorities also showed catch drains around coal dumps on one of the weighbridge. On the slopes from coal weighbridge area drains were constructed and connected to a newly constructed siltation pond. This was being done for preventing coal dust how to downside in river Barki. However civil world was yet to	in 2019 on Haul road as Avenue plantation.On the slope of Dhudhmatia nallah 2000 Bamboo plants have been Planted in 2020. It is further proposed that a. Garland drain, all along in between the OB dump and diverted nala, will be provided to check the run-off coming directly from embankment. b. Before monsoon bed of channel should be cleaned with proper gradient. c. Plantation will be developed all along the banks of Nala. The following action has already been undertaken for prevention of pollution: a. Construction of quarry boulder retaining wall at Honhe OB dump is completed with garland drain of 2 Km. b. Catch drain of 2 Km length & 02 nos of siltation ponds constructed around Honhe OB Dump. c. Sedimentation tanks have been de-silted for its proper functioning Development of catch drains, siltation pond ,garland drain and measures for control of dust are ongoing activities in the mine and are undertaken on regular basis. The dimension of catch drains will be suitably modified during monsoon preparation-2021 to avoid over flow and pollution of nearby streams. The detailed action plan for compliance of the said works is enclosed as separately at Annexure-1 for kind information.

	complete there. Some gabions may be required there for complete control of coal dust/silt flow. Bingalat OB dump: Catch drains were observed on some portions of Bingalat O/B dump. However on some portions catch drains were not constructed. Siltation ponds were not constructed along with catch drains in the Bingalat O/B dump facing Bingalat village and Dhudhumatia nala. There were portions between Bingalat O/B dump and Dhudhmatia nala where catch drains siltation ponds and toe wall was not constructed and it was instructed to construct those urgently/immediately. Honhe OB dump: Catch drains and siltation ponds were observed around Honhe O/B dump Retaining wall at the toe of the dump was observed on most part of the Honhe O/B dump. Around Bingalat O/B duinp, retaining wall at the toe of the dump was observed on many portions except a few portions especially along the side facing Dhudhmatia nala. Catch drains and siltation pond arljacent to the Sliivpvir railway siding had been silted/filled with coal dust. Also some coal dust was observed beyond the siltation pond there which means there was leakage of coal dust into the surroundings. Toe wall was observed between top soil dump and Honhe O/B dump. However there was no Catch drains/ toe wall between top soil dump and O/B dump in the south side.	
c (viii)	Oil and grease trap was observed in the project. However, it appeared that it was not utilised for washing of HEMM/trucks there. The oil and grease trap was too small for such a large project where many HEMM and trucks were operational. Also, discharge from oi1 and grease trap was releascd from two sides itito a pit that was very close to Dhudhmatia nala. There was no mechanism for water recirculation after cleaning (after elimination of oil & grease). Project	The existing oil and grease trap will be replaced by a larger work shop effluent treatment plant and oil and grease trap. A composite work order has been issued by M/s NBCC on 13.11.2020 for an award value of Rs.611.00 crores. It includes development of township and service buildings etc. The average quantity of burnt oil stored at site per year is about 10 KL.

	authorities did not explain satisfactorily wliet-e they store the oil & grease taken out of the trap and how much quantity of oil and grease was collected for last couple of months. Project proponent should submit the Effluent water monitoring data of workshop.	
c (xi)	A riverine/riparian ecosystem conservation and management plan has not been submitted by PP. Overburden material was observed in the slopes facing Dhudhmatia nala at many places. It was instructed to develop grassing and vegetation urgently on the slopes facing Dhudhmatia nala. Grassing and vegetation have been developed at many places on Bingalat O/B dump. However, there are still many places on the Bingalat O/B dump where grassing and vegetation has not been developed. Grassing and vegetation should be developed urgently on the sides/slopes of O/B dump facing Dudhmatia nala and also on the remaining portions. Catch drains were made adjacent to the coal dump in such a way that there was coal transportation road between coal dump and catch drains. Depth and width of catch drains near coal dump was not sufficient. Since there were no siltation ponds attached with those catch drains there were chances that coal dust water would flow to Dhudhmatia nala adjacent to those drains. Also, there were open places between drains for vehicle movement and coal dust would flow from there to Dudhmatia nala. It was instructed to project authorities to make full proof arrangement, Catch drains of appropriate depth and width, siltation ponds etc. to ensure that no coal dust flows into the Dhudhmatia nala. On the slopes from coal weighbridge area, drains were constructed and connected to a newly constructed siltation pond. This was being done for preventing coal dust flow to downside in river Barki. However civil work has not been completed yet.	A watershed study has been prepared by CMPDI as part of EMP of Amrapali OCP (12 MTPA). The revalidated study alongwith riverine ecosystem management plan has been submitted. Plantation and grassing of slope is an ongoing in the project. The status as on date is given below- a. Around 25,134 plants have been planted for raising of Green Belt / Block plantation. Details of plantation is given below:- b. 13000 plants (approx.) on Binglat OB dump & 1000 plants (approx.) near Ambey & Mahalaxmi camp c. 150 plants (approx.) at Govt. School Honhe & St. Joseph School Mander d. 1200 plants around NBCC road in 3 Ha area by State Forest Department. e. Plantation of 850 numbers of native species along the Haul road of Amrapali project. f. 934 nos. of drought hardy native species have been planted at Haul road near Dudhmatia nallah in mine. g. 8000 saplings (2000 saplings of Bamboo on slope of Dudhmatia nallah, 3000 saplings on North-East side of Binglat O/B dump , west side of O/B dump & 1000 numbers of fruit species at PO office, VTC, Store & other infra.) planted in Monsoon 2020. h. In Monsoon 2020, Seed ball plantation carried out over Binglat OB dump and topsoil stockyard near Honhe. Work is completed at Binglat OB dump area. i. About 5000 saplings of multi species will be planted during monsoon 2021 for development of Green Belt in and around the mine site. j. Grassing along gaps on the slope of OB dump will again be started during monsson-2021 as done during monsoon

	Some gabions may be required there for complete conti ol of coal dust/silt flow.	2020. It is further proposed that a. Garland drain, all along in between the OB dump and diverted nala, will be provided to check the run-off coming directly from embankment. b. Before monsoon bed of channel should be cleaned with proper gradient. c. Plantation will be developed all along the banks of Nala.
c (ii) & j (iv)	Environmental parameters were not displayed at suitable locations.	Environmental parameters have been suitably displayed at project office as directed.
d (i) & (iii)	From the submitted data it is not clear whether the monitoring has been dome at night or not. Total number of Ear plugs/Muffs provided in the year 2017, 2018, 2019 was not submitted by PP.	Dust masks are mainly provided to employees/workers in the project, During 2020, 8006 dust masks were distributed. During 2020, 87 ear plugs/ear muffs were distributed to workers
e (iii)	Project proponent did not show any effects/process in the project done for‘ reducing energy and fuel consumption & use of renewable energy.	12 numbers of solar power operated deep bore wells with water storage facility installed.1460 household solar units which consists of 1 solar panel,1 solar tubular battery, 1 solar charger controller,1 solar table fan and 2 LED bulbs have been distributed amongst the nearby villagers. 

		
e (ii)	In the backfilled area in the lower portion vehicles plied for various activities. However it was suggested that proper slope stability studies may be done so that there is no danger from dump failures/slope failures which may lead to risk to men and machinery.	Slope stability study has been done by IIT (BHU) vide work order no PO(A)/PD/20-21/1944 on 06.11.2020. Draft copy submitted on 26.01.2021 by IIT (BHU).
f (iii)	PP should submit progressive compliance status vis-à-vis the post mining land use pattern as per this EC condition.	The progressive compliance of reclamation was monitored every three years till 2019.It is now being monitored on yearly basis and the same will be submitted to RO, MoEF&CC for the year-20-21 by June-2021.
g (ii)	Greenbelt consisting of 3-tier plantation of width not less than 7.5 m has not been developed. Some Green belt has been developed along the major approach/coal transport i'oads. However, there remains many areas along the above roads where green belt has to be developed.	Around 25,134 plants have been planted for raising of Green Belt / Block plantation. Details of plantation is given below:- a. 13000 plants (approx.) on Binglat OB dump & 1000 plants (approx.) near Ambey & Mahalaxmi camp. b. 150 plants (approx.) at Govt. School Honhe & St. Joseph School Mander. c. 1200 plants around NBCC road in 3 Ha area by State Forest Department. d. Plantation of 850 numbers of native species along the Haul road of Amrapali project. e. 934 nos. of drought hardy native species have been planted at Haul road near Dudhmatia nallah in mine. f. 8000 saplings (2000 saplings of Bamboo on slope of

		Dudhmatia nallah, 3000 saplings on North-East side of Binglat O/B dump , west side of O/B dump & 1000 numbers of fruit species at PO office, VTC, Store & other infra.) planted in Monsoon 2020. g. In Monsoon 2020, Seed ball plantation carried out over Binglat OB dump and top soil stockyard near Honhe. Work is completed at Binglat OB dump area. h. About 5000 saplings of multi species will be planted during monsoon 2021 for development of Green Belt in and around the mine site. During monsoon 2021, 23.42 Ha of plantation will be raised over backfilled area, industrial infrastructure, road & green belts. During monsoon 2022, 17.36 Ha. & during monsoon-2023 50 Ha of plantation will be raised over backfilled area, industrial infrastructure, road & green belts.
h (i)	Project proponent has not submitted weekly illumination monitoring data.	As per DGMS circular no. DGMS (legis.) circular no.2 of 2017 dated 06.11.2017 illumination survey is required to be done on monthly basis. The same procedure is followed in the mine and last survey was conducted on 20.10.2021.
h (iii)	No details have been provided regarding training provided in the year 2018 and 2019. Project proponent should explain why only 41 dust masks were issued in the year 2019 and Nil dust masks were issued in the year 2016 and 2017. No details have been provided regarding train ing provided in the year 2018 and 2019.	Dust masks are mainly provided to employees/workers in the project, During 2020, 8006 dust masks were distributed. During 2020, 87 ear plugs/ear muffs were distributed to workers.
h (iv)	Project authorities should take concrete steps for controlling air and water pollution as committed in Public hearing.	**Air Pollution control measures-** a. The fixed water sprinkling system over 01 Km length has been constructed at Ursu Checkpost . b. The work for fixed water sprinkling system over a length of 1200 Km at haul road approaching to Shivpur Siding is under tendering process. c. 03 number of departmental water sprinklers of 28 KL capacity deployed for water sprinkling. In addition, there are 13 contractual water sprinklers of 12 KL & 20 KL

		capacities deployed with an average of 9 trips/tanker/day. **Water Pollution control measures-** a. Construction of 1 no check dam at Dhudhmatia nallah near Binglat OB dump has been completed for the ground water recharge and to prevent the siltation. b. Construction of 4 check dams is under progress. Work Awarded Parsana village. Time period:- March 2021. c. Construction of check dams at Honhe and Kendru River is under progress. TCR approved & in Award stage for Check Dam at Honhe River. Time period:- April 2021. d. Construction of rainwater harvesting system at PO office and Executive Hostel of Amrapali Project. e. Ponds have been constructed at Honhe, Birhortola (Koyed) and Ursu.
I (ii)	In the environmental policy no details have been provided on standard operating procedures to have proper checks and balances and to bring into focus any infringements/ deviation/ violation of the environmental/forest /wi1dlife norms/ conditions. Project authorities should also submit documents to prove that there exists system of reporting infringements/ deviation/ violation of the environmental/forest/wildlife norms/conditions and/or shareholders /stake holders.	The environmental policy of CIL ha s been adopted after approval in CCL also. One of the objectives of the policy is to ensure compliance of all EC conditions. The SOP of environmental clearance includes responsibility for managing showcause etc raised by JSPCB. The SOP of Environment and Forest department was approved on 06.07.2019 which enlists the activities for EC and CTO to avoid any deviation from prevailing acts/rules. CCL Board approved environmental Policy on 16.11.2019.
I (iv)	Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company (duly approved by competent authority) has not been submitted by project proponent. Expenditure data on environment protection measures and year wise progress of implementation of action plan should be submitted to IRO, Ranchi.	Expenditure incurred on environmental protection measures under Amrapali OCP in 2019-20 is Rs. 347.85 lakh. Action Plan for EMP has been prepared and is enclosed for kind consideration
j (ii)	Date of receipt of the EC letter by Mukhiya is not mentioned.	EC copy received by Mukhia on 25.03.2020 vide letter no. PO/Amrapali/Env/2019-20/2735A
j (i)	The advertisement has been made in "Prabhat Khabar" and in "The Pioneer" on 25.07.2020.	Being Complied.

Annexure-1

Year	Capital Cost of Environmental Control Measures Activity	Details	Estimated Capital Cost in Rs. Lakhs	Tentative time line of Completion
2021-22	Fixed sprinkling system of on Haul Road	1.30 km length along Haul road at Honhe side	90	Tender Floated. Work Order to be Issued. Tentative date of Completion: March 2021
	Fixed sprinkling system on Coal tranportation road at Honhe Village	1.3 km length	100	Tender Finalized. Tentative date of Completion: June 2021
	Fog Canon at Coal stock yard	1 no.	80	July 2021
	PCC Topping of Coal transportation road	5 km Length and 10 m Width of road	900	Tender Finalized. Tentative date of Completion: June 2021
	Road Sweeping Machines on CTR	2 nos.	150	Sept' 2021
	Vehicle wheel washing system on CTR	2 nos. on both ends of CTR	90	July 2021
	Wind Barriers along stock yard	1200 m along coal stock yard and	60	Sept 2021
	Wind Barriers along the Project boundary at Pachra Village and Ursu Village	3.1 km and 7 m Height	155	Sept 2021
	Wind Barriers along Coal Transportation road	Around 2000 m near Honhe village	100	July 2021
	Construction of Check dams	2 No.of Checkdams on Honhe nala and 4 no. of Checkdams on Binglat Nala	350	Tender Floated. Work Order to be Issued. Tentative date of Completion: March 2021
	Toe wall, Granland Drain and settling pond	1.5 km Toe wall and garland drain along OB dump,Top soil Dump	60	July 2021
	Diversion of Dudhmatia Nala	1500 m nala Diversion along the northern boundary of project	164.36	May-21
	Garland Drain	In between the OB dump and diverted nala of Length 1500m	60	May-21

	Embankment	Earthern Embankment with stone pitching and Toe wall along nala of Length 3100 m anf Height 3 m	210	Jun-21
	Piezometers	Additional 05 no. of Piezometers have been proposed to monitor the ground water level.	40	Tender Floated. Work Order to be Issued. Tentative date of Completion: March 2021
	Rain Water Harvesting System	Roof top rain water harvesting system at 35 locations	45	July 2021
	Continuous Air Quality monitoring systems	CAAQMS and Continuous PM10 Analyzer	125	Tender under process.
	Green Belt	Green belt along project, road, nala and embankment 17.42 Ha,	696.8	Monsoon 2021
	Afforestration	6.00 Ha	82	Monsoon 2021
	3-tier Avenue Plantation along Coal Transportation road	7.5 Ha of Avenue Plantation on CTR	30	Monsoon 2021
2022-23	Sewage Treatment Plant	Proposed township will be provided with integrated sewage treatment plant.	200	Construction work of colony has been started by NBCC Tentative date of Completion: March 2023
	Embankment along Barki River	Embankment will be provided along the Barki river and green belt will be developed.	500	Mar-23
	Green Belt	Green belt along project 7.20 Ha	288	
	Plantation on Reclaimed Land	10.16	35.56	Monsoon 2022
2023-24	Plantation on reclaimed land	50 Ha	175	Monsoon 2023
Post Closure	Plantation on reclaimed land	184 Ha	644	Monsoon 2024 & Post Closure
Conservation of Flora and Fauna		Conservation Measures for schedule-I species	4236	Throughout the life of Mine
Total EMP Cost			**9666.72**	

Estimated Revenue Cost of Environmental Control Measures

S No.	Particulars	Annual Revenue Cost (Rs Lakh)
1	Environmental Monitoring Cost	46.96
2	Plantation Maintenance Cost	46
3	Operation and Maintenance of Air Pollution control Measures	85
4	Maintenance cost for ETP and STP	15
5	Maintenance of RWH, Catch drains, Storm water drains and other developmement measures in Township	15
Total Revenue Cost		**207.96**

ENCLOSURE 02

Bid Number: GEM/2020/B/929404
Dated: 22-12-2020

Bid Document

Bid Details	
Bid End Date/Time	12-01-2021 17:00:00
Bid Opening Date/Time	12-01-2021 17:30:00
Bid Life Cycle (From Publish Date)	90 (Days)
Bid Offer Validity (From End Date)	65 (Days)
Ministry/State Name	Ministry Of Coal
Department Name	Materials Management
Organisation Name	Central Coalfields Limited
Office Name	Central Coalfields Limited
Total Quantity	14
Item Category	Continuous Ambient Air Quality Monitoring System (CAAQMS)
MSE Exemption for Years of Experience and Turnover	No
Startup Exemption for Years of Experience and Turnover	No
Document required from seller	Certificate (Requested in ATC),OEM Authorization Certificate,Additional Doc 1 (Requested in ATC) *In case any bidder is seeking exemption from Experience / Turnover Criteria, the supporting documents to prove his eligibility for exemption must be uploaded for evaluation by the buyer
Bid to RA enabled	Yes
Inspection Required	No
Estimated Bid Value	161896000
Evaluation Method	Total value wise evaluation

EMD Detail

Required	No

ePBG Detail

Advisory Bank	State Bank of India
ePBG Percentage(%)	10.00
Duration of ePBG required (Months).	43

(a). EMD & Performance security should be in favour of Beneficiary, wherever it is applicable.

Beneficiary:
Assistant Manager MM
Central Coalfields Limited, Materials Management, Central Coalfields Limited, Ministry of Coal
(Prem Shankar)

Splitting

Bid splitting not applied.

MII Purchase Preference

MII Purchase Preference	Yes

MSE Purchase Preference

MSE Purchase Preference	Yes

1. Preference to Make In India products (For bids < 200 Crore):Preference shall be given to Class 1 local supplier as defined in public procurement (Preference to Make in India), Order 2017 as amended from time to time and its subsequent Orders/Notifications issued by concerned Nodal Ministry for specific Goods/Products. The minimum local content to qualify as a Class 1 local supplier is denoted in the bid document. If the bidder wants to avail the Purchase preference, the bidder must upload a certificate from the OEM regarding the percentage of the local content and the details of locations at which the local value addition is made along with their bid, failing which no purchase preference shall be granted. In case the bid value is more than Rs 10 Crore, the declaration relating to percentage of local content shall be certified by the statutory auditor or cost auditor, if the OEM is a company and by a practicing cost accountant or a chartered accountant for OEMs other than companies as per the Public Procurement (preference to Make-in -India) order 2017 dated 04.06.2020. Only Class-I and Class-II Local suppliers as per MII order dated 4.6.2020 will be eligible to bid. Non - Local suppliers as per MII order dated 04.06.2020 are not eligible to participate. However, eligible micro and small enterprises will be allowed to participate .In case Buyer has selected Purchase preference to Micro and Small Enterprises clause in the bid, the same will get precedence over this clause.
2. Purchase preference to Micro and Small Enterprises (MSEs): Purchase preference will be given to MSEs as defined in Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012 dated 23.03.2012 issued by Ministry of Micro, Small and Medium Enterprises and its subsequent Orders/Notifications issued by concerned Ministry. If the bidder wants to avail the Purchase preference, the bidder must be the manufacturer of the offered product in case of bid for supply of goods. Traders are excluded from the purview of Public Procurement Policy for Micro and Small Enterprises. In respect of bid for Services, the bidder must be the Service provider of the offered Service. Relevant documentary evidence in this regard shall be uploaded along with the bid in respect of the offered product or service. If L-1 is not an MSE and MSE Seller (s) has/have quoted price within L-1+ 15% (Selected by Buyer)of margin of purchase preference /price band defined in relevant policy, such Seller shall be given opportunity to match L-1 price and contract will be awarded for 25%(selected by Buyer) percentage of total QUANTITY.

Continuous Ambient Air Quality Monitoring System (CAAQMS) (14 pieces)

(Minimum 20% Local content required for MII compliance)

Technical Specifications

* As per GeM Category Specification

Specification	Specification Name	Bid Requirement (Allowed Values)
Housing/Container	**Supply of Housing/Container, Monitoring Station Foundation at Buyer/User Site**	Yes
	Additional Equipment & Accssories supplied	Vaccum Cleaner, Hand tool kit, Emergency led light, CPCB Sign Board, NA (IF Housing/Container Not Supplied)
Air conditioner	**Supply of Air Conditioner, Split Type, Wall mounted along with voltage**	Yes

	stabilizer (2pcs X 2 ton, 1 pcs X 1 Ton). at the CAAQM Station	
Online Uninterrupted Power Supply (UPS)	**Supply of On line UPS (1X10KVA, 1 hr. back up and 1X5 KVA, 2 hr. back up) at the CAAQM Station**	Yes
Ambient SO2 Analyser	Digital Output Options of Ambient SO2 Analyser	Multiple Drop RS 232, USB port /TCP/IP, Ethernet
	Analog Output Current of Ambient SO2 Analyser (mA)	2 - 20, 4 - 20
	Supply of One quantity of Continuous Ambient Sulphur Dioxide (SO2) Analyzer	Yes
Ambient NO2, NO and NOx Analyser	**Supply of One quantity of Continuous Ambient Oxides of Nitrogen (NO/NO2 / NOx) Analyzer**	Yes
	Digital Output Options of Ambient NO2, NO and NOx Analyser	Multi drop RS 232 port, USB port /TCP/IP, Ethernet
	Analog Output Voltage of Ambient NO2, NO and NOx Analyser, volt	0 - 1, 0 - 10
	Analog Output Current of Ambient NO2, NO and NOx Analyser, mA	2 - 20, 4 - 20
Ambient NH3 Analyser	**Supply of One Quantity of Continuous Ambient Ammonia (NH3) Analyzer**	Yes, No
Ambient CO Analyser	Analog Output Current of Ambient CO Analyser, mA	2 - 20, 4 - 20
	Analog Output Voltage of Ambient CO Analyser, volt	0 - 1, 0 - 10
	Digital Output of Ambient CO Analyser	Multiple drop RS 232port, USB port /TCP/IP ,Ethernet
	Principle of Ambient CO Analyser	Non Dispersive Infra-Red (NDIR) with Gas Filter Correlation, Cross Flow Modulation Method
	Supply of One Quantity of Continuous Ambient Carbon Monoxide (CO) Analyzer	Yes
Ambient O3 Analyser	**Supply of One Qty of Continuous Ambient Ozone (O3) Analyzer**	Yes, No
Ambient BTEX Analyser	**Approval**	USEPA, TUV, MCERT, NA (IF Ambient BTEX Analyser Not Supplied)

	Supply of One qty of Continuous BTEX Monitor / Analyzer	Yes, No
Continuous PM10 Monitoring Analyser	Analog Output of Continuous PM10 Monitoring Analyser(mA)	2 - 20, 4 - 20
	Detector of Continuous PM10 Monitoring Analyser	Plastic Scintillator, GM Counter, Silicon- Semiconductor base
	Supply of One qty of Automatic PM10 Particulate Matter Monitor	Yes
	Approval of Continuous PM10 Monitoring Analyser	USEPA, TUV
	Digital Output of Continuous PM10 Monitoring Analyser	Multi drop RS 232 port, USB port, TCP/IP Ethernet
	Analog Output of Continuous PM10 Monitoring Analyser (volt)	0 - 1, 0 - 10
Continuous PM2.5 Monitoring Analyser	**Supply of One qty of Automatic PM2.5 Particulate Matter Monitor**	Yes
	Digital Output of Continuous PM2.5 Monitoring Analyser	Multi drop RS 232 port, USB port, TCP/IP Ethernet
	Analog Output Current of Continuous PM2.5 Monitoring Analyser (mA)	2 - 20, 4 - 20
	Analog Output Voltage of Continuous PM2.5 Monitoring Analyser(volt)	0 - 1, 0 - 10
	Approval of Continuous PM2.5 Monitoring Analyser	USEPA, TUV
	Detector of Continuous PM2.5 Monitoring Analyser	Plastic Scintillator, GM Counter, Silicon- Semiconductor base
Sampling System	**Supply of One qty of Sampling System having 10 port manifold**	Yes
Ambient Weather Station	Relative Humidity Sensor type	Capacitive, Solid State
	Supply of Ambient air Weather Station	Yes
Multipoint Gas Calibration System	The Permeation System should be capable to accept permeation tubes up to 6 cm in length and 2cm in diameter with user selectable	Yes

	temperature setting of 40 OC and 50 OC	
	Ozone analyzer	Yes
	Calibration using permeation tubes for which at least two chambers based Permeation system has to be provided	Yes
	Supply of One set of Calibration System	Yes
Work Station Computer	**Supply of Data Acquisition System (DAS), One for each CAAQM Station**	Yes
	Supply of Computer System for DAS: One for each CAAQM Station	Yes
	Supply of One set of Computer System for each CAAQM Station	Yes, No
Industrial Rack	**Supply of Black Industrial Rack**	Yes, No
Rack Server	**Supply of Server Rack**	Yes, No
Wireless Access Point	**Supply of Wireless Accesspoint**	Yes, No
Printer	**Supply of Laser Printer Colour MFP : One for each CAAQM Station**	Yes, No
Unified Threat Management (UTM) Device	**Supply of One for each SPCB**	Yes, No
Additional IT Peripherals	**Supply of Remote Connectivity Tool/Software: One for each SPCB***	Yes, No
	Supply of One set of Central Management Software with License w.r.t. Data Acquisition: One for each SPCB	Yes, No
	Supply of Remote Calibration & Validation Software: One for each SPCB*	Yes
	Supply of One set of 24Ports CISCO Switch: One for each SPCB*	Yes, No
Connectivity for data transfer	**Providing Lease Line for Internet AND Broadband (for Station) AND Data Card as mode Communication system (for display**	Yes, No

	Board)	
Display Board Data Transmission Device	**Software**	Available, NA (IF Display Board Data Transmission Device Not Supplied)
	Supply of Data display Board Transmission Device (two nos)	Yes, No
Day Light and Night Visible True Color Data Display System	**Supply of One set of Day & Night Visible Data Display Board (Near to the station)**	Yes
	Supply of One Set of Day & Night Visible Data Display Board at the respective SPCB-H.O	Yes, No
Warranty	**All supplied items warranty which not mentioned item wise**	3 year onsite warranty

* Specifications highlighted in bold are the Golden Parameters.
* Bidders may note that In respect of non-golden Parameters, the specifications 'Values' chosen by Buyer will generally be preferred over 'Bid requirement (allowed Values) by the Buyer.

Additional Specification Parameters - Continuous Ambient Air Quality Monitoring System (CAAQMS) (14 pieces)

Specification Parameter Name	**Bid Requirement (Allowed Values)**
Approval of Continuous Ambient Oxides of Nitrogen (NO/NO2 / NOx) Analyzer, Sulphur Dioxide (SO2) Analyzer, Carbon Monoxide (CO) Analyzer	USEPA , TUV
Principle of Continuous PM10 Monitoring Analyser and Principle of Continuous PM2.5 Monitoring Analyser	Beta ray Attenuation, Beta Gauge Detection
Principle of Continuous Ambient Oxides of Nitrogen (NO/NO2 / NOx) Analyzer	Chemiluminiscence
Principle of Continuous Ambient Sulphur Dioxide (SO2) Analyzer	UV Fluoroscence

* Bidders offering must also comply with the additional specification parameters mentioned above.

Consignees/Reporting Officer and Quantity

S.No.	Consignee/Reporting Officer	Address	Quantity	Delivery Days
1	Dheeraj Kumar Mishra	825314,Regional Store Parej CCL P.O. Ghatotand , Ramgarh-825314.	1	150
2	Kathirvel S	829113,Regional Store B and K Area CCL Jarangdih, PO Jarangdih, Dist Bokaro	1	150
3	Debapriya Roy	829210,Regional Store NK Area Dakra CCL	1	150

4	Jatindra Nath Dutta	829108,Depot Officer, Regional Store, CCL Argada Area, Gidi - A, P.O. Gidi - A, Dist. Hazaribag, Jharkhand 829108	1	150
5	Atul Kumar	829150,GM Office Rajrappa P.O Rajrappa Project Dist. Ramgarh 829150	1	150
6	Syed Shah Sharfuddin	829113,Regional Stores Jarandih Kathara Area CCL District Bokaro	1	150
7	Kundan Kumar	829144,Regional Store Dhori CCL Makoli, Phusro	1	150
8	Sanjay Singh	829102,Regional Store Saunda, Post- Saunda, Barka Sayal Area	1	150
9	Amal Kumar Pathak	829201,GM Office Piparwar P.O. Bachra District Chatra	3	150
10	Shintu R V	825316,Regional Store Kuju Area CCL	1	150
11	Gobinda Sarkar	815311,Office of GM Giridih, Beniadih, Giridih - 815311	1	150
12	Amol Arun Shankar Sinha	822124,Regional Store, Rajhara Area, P.O.Rajhara Colliery Central Coalfields Limited	1	150

Buyer added Bid Specific Additional Scope of Work

S.No.	Document Title	Description	Applicable i.r.o. Items
1	Additional Scope of Work View	Bidder has to upload acceptance to the Additional Scope of Work and installation location details along with the offer	Continuous Ambient Air Quality Monitoring System (CAAQMS)(14)
2	Comprehensive Maintenance Contract (CMC) includes (Undertaking to be uploaded by bidder) View	Comprehensive Maintenance Cost includes (Undertaking to be given by seller)	Continuous Ambient Air Quality Monitoring System (CAAQMS)(14)

The uploaded document only contains Buyer specific Additional Scope of Work and / or Drawings for the bid items added with due approval of Buyer's competent authority. Buyer has certified that these additional scope and drawings are generalized and would not lead to any restrictive bidding.

Bid Specific Additional Terms and Conditions

1. Actual delivery (and Installation & Commissioning (if covered in scope of supply)) is to be done at following address Area GM Office, Kathara Area, Dhori Area, NK Area Area GM Office, Argada Area, Hazaribagh Area, Barkasayal Area Area GM Office, Piparwar Area, Project Officer's Office, Magadh OCP, Project Officer's Office, Amrapali OCP Area GM Office, Kuju Area, Rajhara Area, B & K Area Area GM Office, Giridih Area, Rajrappa Area.
2. Data Sheet of the product(s) offered in the bid, are to be uploaded along with the bid documents. Buyers can match and verify the Data Sheet with the product specifications offered. In case of any unexplained mismatch of technical parameters, the bid is liable for rejection.
3. Installation, Commissioning, Testing, Configuration, Training (if any - which ever is applicable as per scope of supply) is to be carried out by OEM / OEM Certified resource or OEM authorised Reseller.
4. Scope of supply includes Training: Number of employees to be trained 2 , Place for Training At Each CAAQMS station and Duration of training 5 days.
5. The successful bidder has to supply all essential accessories required for the successful installation and commissioning of the goods supplied. Besides standard accessories as per normal industry practice, following accessories must be part of supply and cost should be included in bid price: All Standard Accessories as per normal industry practice.
6. **Upload Manufacturer authorization:** Wherever Authorised Distributors are submitting the bid, Manufacturers Authorisation Form (MAF)/Certificate with OEM details such as name, designation, address, e-mail Id and Phone

No. required to be furnished along with the bid.

7. Without prejudice to Buyer’s right to price adjustment by way of discount or any other right or remedy available to Buyer, Buyer may terminate the Contract or any part thereof by a written notice to the Seller, if:
   i) The Seller fails to comply with any material term of the Contract.
   ii) The Seller informs Buyer of its inability to deliver the Material(s) or any part thereof within the stipulated Delivery Period or such inability otherwise becomes apparent.
   iii) The Seller fails to deliver the Material(s) or any part thereof within the stipulated Delivery Period and/or to replace/rectify any rejected or defective Material(s) promptly.
   iv) The Seller becomes bankrupt or goes into liquidation.
   v) The Seller makes a general assignment for the benefit of creditors.
   vi) A receiver is appointed for any substantial property owned by the Seller.
   vii) The Seller has misrepresented to Buyer, acting on which misrepresentation Buyer has placed the Purchase Order on the Seller.
8. Scope of supply (Bid price to include all cost components) : Supply Installation Testing Commissioning of Goods and Training of operators and providing Statutory Clearances required (if any)
9. Purchase preference to Micro and Small Enterprises (MSEs): Purchase preference will be given to MSEs as defined in Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012 dated 23.03.2012 issued by Ministry of Micro, Small and Medium Enterprises and its subsequent Orders/Notifications issued by concerned Ministry. If the bidder wants to avail the Purchase preference, the bidder must be the manufacturer of the offered product in case of bid for supply of goods. Traders are excluded from the purview of Public Procurement Policy for Micro and Small Enterprises. In respect of bid for Services, the bidder must be the Service provider of the offered Service. Relevant documentary evidence in this regard shall be uploaded along with the bid in respect of the offered product or service. If L-1 is not an MSE and MSE Seller (s) has/have quoted price within L-1+ 15% of margin of purchase preference /price band defined in relevant policy, such Seller shall be given opportunity to match L-1 price and contract will be awarded for percentage of 25% of total value.
10. Preference to Make In India products (For bids less than 200 Crore):Preference shall be given to Class 1 local supplier as defined in public procurement (Preference to Make in India), Order 2017 as amended from time to time and its subsequent Orders/Notifications issued by concerned Nodal Ministry for specific Goods/Products. The minimum local content to qualify as a Class 1 local supplier is denoted in the bid document 50%. If the bidder wants to avail the Purchase preference, the bidder must upload a certificate from the OEM regarding the percentage of the local content and the details of locations at which the local value addition is made along with their bid, failing which no purchase preference shall be granted. In case the bid value is more than Rs 10 Crore, the declaration relating to percentage of local content shall be certified by the statutory auditor or cost auditor, if the OEM is a company and by a practicing cost accountant or a chartered accountant for OEMs other than companies as per the Public Procurement (preference to Make-in -India) order 2017 dated 04.06.2020. Only Class-I and Class-II Local suppliers as per MII order dated 4.6.2020 will be eligible to bid. Non - Local suppliers as per MII order dated 04.06.2020 are not eligible to participate. In case Buyer has selected Purchase preference to Micro and Small Enterprises clause in the bid, the same will get precedence over this clause.
11. Dedicated /toll Free Telephone No. for Service Support : BIDDER/OEM must have Dedicated/toll Free Telephone No. for Service Support.
12. Escalation Matrix For Service Support : Bidder/OEM must provide Escalation Matrix of Telephone Numbers for Service Support.
13. Bidder's offer is liable to be rejected if they don't upload any of the certificates / documents sought in the Bid document, ATC and Corrigendum if any.
14. The bidder is required to upload, along with the bid, all relevant certificates such as BIS licence, type test certificate, approval certificates and other certificates as prescribed in the Product Specification given in the bid document.
15. To be eligible for award of contract, Bidder / OEM must possess following Certificates / Test Reports on the date of bid opening (to be uploaded with bid): 1. USEPA/TUV approvals of the offered Analysers. 2. Guarantee/warranty card 3. Spare parts catalogue, service manual. 4. System/assembly/layout drawing 5. Detailed design of foundation and housing container. 6. User manual of all analysers/weather monitoring system.
16. Over and above the normal Warranty terms as per GeM GTC, the successful bidder / OEM shall have to provide Comprehensive Warranty during the entire Standard warranty period as per contract. : The comprehensive warranty shall be covering the following scope The CAAQMS shall be guaranteed for satisfactory performance for warranty period (3 years) from date of commissioning. The warranty shall cover all components/parts/sub-assembly/equipment covered by supply order including calibration of sensors/analysers/system. The seller shall provide all spares, consumables, gases, software (with valid license) for uninterrupted operation at the cost of seller along with data connectivity to Pollution Control Board Servers during warranty period of 3 Years. (Upload an undertaking with the bid confirming compliance by the bidder if Bidder is taking onus of this compliance. In case OEM is taking onus of this compliance, OEM undertaking is to be uploaded along with Bidder undertaking)
17. Bidder / OEM has to give an undertaking that after expiry of warranty period, it will provide Comprehensive Maintenance Service for next 5 years for the offered products at the rate not more than 5 % of contract price per annum. Buyer reserves the right to enter into a CMC agreement with the Successful Bidder / OEM after expiry of the Warranty period at above mentioned rate and the payment for the CMC charges would be made Biannually after rendering of the CMC Services of the relevant CMC period. Performance Security of the successful bidder shall be forfeited if it fails to accept the CMC contract when called upon by the buyer. CMC would include cost of Refer attachment for undertaking (Upload the undertaking). The original Performance Security of contract will be returned only after submission and verification of AMC Performance Security for 10% of total CMC value valid up to CMC period plus 2 months (if there is no other claim).

18. Successful bidder will have to ensure that adequate number of dedicated technical service personals / engineers are designated / deployed for attending to the Service Request in a time bound manner and for ensuring Timely Servicing / rectification of defects during warranty period, as per Service level agreement indicated in the relevant clause of the bid.
19. Warranty period of the supplied products shall be 3 years from the date of final acceptance of goods or after completion of installation, commissioning & testing of goods (if included in the scope of supply), at consignee location. OEM Warranty certificates must be submitted by Successful Bidder at the time of delivery of Goods. The seller should guarantee the rectification of goods in case of any break down during the guarantee period. Seller should have well established Installation, Commissioning, Training, Troubleshooting and Maintenance Service group in INDIA for attending the after sales service. Details of Service Centres near consignee destinations are to be uploaded along with the bid.
20. Timely Servicing / rectification of defects during warranty period: After having been notified of the defects / service requirement during warranty period, Seller has to complete the required Service / Rectification within 15 days time limit. If the Seller fails to complete service / rectification with defined time limit, a penalty of 0.5% of Unit Price of the product shall be charged as penalty for each week of delay from the seller. Seller can deposit the penalty with the Buyer directly else the Buyer shall have a right to recover all such penalty amount from the Performance Security (PBG).Cumulative Penalty cannot exceed more than 10% of the total contract value after which the Buyer shall have the right to get the service / rectification done from alternate sources at the risk and cost of the Seller besides forfeiture of PBG. Seller shall be liable to re-imberse the cost of such service / rectification to the Buyer.
21. Buyer Organization specific Integrity Pact shall have to be complied by all bidders. Bidders shall have to upload scanned copy of signed integrity pact as per Buyer organizations policy along with bid. Click here to view the file

This Bid is also governed by the General Terms and Conditions

In terms of GeM GTC clause 26 regarding Restrictions on procurement from a bidder of a country which shares a land border with India, any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority. While participating in bid, Bidder has to undertake compliance of this and any false declaration and non-compliance of this would be a ground for immediate termination of the contract and further legal action in accordance with the laws.

---Thank You---

Photographs showing proposed Site at Amrapali PO Office for installation of CAAQMS

ENCLOSURE 03

CENTRAL COALFIELDS LIMITED
(A Subsidiary of Coal India Limited)
PURCHASE DEPARTMENT
Darbhanga house: Ranchi 834 001 (Jharkhand) India
(PBX) 2360726, 2360687, Telex: 0625-201
Gram: COLCENT, Fax (91) 0651-2360198, E-Mail # gmmm.ccl@coalindia.in

FORMAL ORDER
No: 010:01:1:03:20:047

BY REGISTERED POST
Dated: 22.10.2020

Item category	Firm category	Tender category	Vendor Code
P&M (Environment)	MSE (Small) UAM No. – **MH33A0009979**	ODT cum e-RA	I/17/M/M/029

To
M/s. Environnement SA Pvt. Ltd.
D 16, 3 & 4, TTC Industrial Area, MIDC Turbhe,
Navi Mumbai – 208 022 (Maharashtra)
Email: **sales.india@environnement-sa.com**
GSTIN – 27AACCE0200B1ZO

Contact Person: Praful Koli
Phone No: - 022-45020000
Mo: - +91- 9920010519
PAN - AACCE0200B

Sub: Supply, Installation & Commissioning of PM10 Analyzers along with one year warranty followed by 05 (Five) years of Annual Maintenance Contract (AMC)

Ref: 1. Tender Sl. No. – 008 Dated 21.08.2020
2. This office Tender No. CCL/MMD/HQ/RK/E&F/ R-010/ Retender-1/2020-21, opened on 15.09.2020 (Tender ID: - 2020_CCL_178125_1).
3. Your online offer through the portal of www.coalindiatender.gov.in (Bid No. - 555209) & subsequent clarifications sought on the portal.

Dear Sirs,
With reference to the above, please arrange to supply the following item(s) on the terms and conditions noted here under:

1. Scope of Supply:

Sr.	Item Description	HSN Code	Qty. (Nos.)	Unit Basic Price (in Rs.)	Extended Value (in Rs.)
1.	Supply, Installation & Commissioning of PM10 Analyzers along with one year warranty. **Refer Annexure – T1 to T3 for TPS & detailed Technical Specifications & Bill of Material accepted by the technical deptt.** **Material Code**: 87254000000	90271000	25	8,50,261.00	**2,12,56,525.00**
2.	Installation, Commissioning and Training Charges per equipment (in Rs.)			10,000.00	**2,50,000.00**
3.	Sub-total order value incl. of Installation, Commissioning & Training charges (in Rs.)				**2,15,06,525.00**
4.	IGST @ 18% (in Rs.)				**38,71,174.50**
5.	**Total Order Value inclusive of GST (exclusive of AMC Charges) (in Rs.) [Sr. 3 + 4]**				**2,53,77,699.50**
6.	**Provisional TCS @ 0.1% on total order value inclusive of GST (exclusive of AMC Charges) (in Rs.)**				**20,377.70**
Sr.	**Annual Maintenance Contract (AMC) for 05 years after 01 (One) year of Warranty Period (Non-NPV)**				
(Refer Annexure – T4 for detailed terms & conditions of AMC)				**Per unit (in Rs.)**	**Extended Value (in Rs.)**
6.	AMC Charges for the 1st Year per equipment / set (in Rs.)			11,050.00	2,76,250.00
7.	AMC Charges for the 2nd Year per equipment / set (in Rs.)			11,320.00	2,83,000.00
8.	AMC Charges for the 3rd Year per equipment / set (in Rs.)			11,600.00	2,90,000.00
9.	AMC Charges for the 4th Year per equipment / set (in Rs.)			11,900.00	2,97,500.00
10.	AMC Charges for the 5th Year per equipment / set (in Rs.)			12,200.00	3,05,000.00
11.	Sub-total of AMC Charges (Non-NPV) for 5 years after 01 year warranty period (in Rs.)				**14,51,750.00**
12.	IGST @ 18% on AMC Charges (in Rs.)				**2,61,315.00**
13.	**Total AMC Charges (Non-NPV) inclusive of GST (in Rs.) [Sr. 11 + 12]**				**17,13,065.00**
14.	**Total Purchase Value / FOR Destination value (in Rs.) [Sr. 5+ 13]**				**2,70,90,764.50**
15.	**Less for Input Tax Credit on account of GST (in Rs.) [Sr. 4 + 12]**				**41,32,489.50**
16.	**Total Purchase Value after availing Input Tax Credit Cost to CCL (in Rs.) [Sr. 14 - 15]**				**2,29,58,275.00**

(N.B.: Provisional TCS @ 0.1% has been levied on the total order value of goods inclusive of GST (for value exceeding Rs. 50.00 Lakhs) which comes at Rs. 20,377.70 in line with "Guidelines under section 194-O (4) and section 206C (1-I) of the Income Tax Act, 1961- reg." Dated. 29.09.2020. Payment of TCS to the firm, if applicable, shall be taken care by the paying authority at the time of bill payment as per rule).

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2. **Total Purchase Value / FOR Destination value (incl. of GST & AMC Charges): Rs. 2,70,90,764.50/-** (Rupees Two Crores Seventy Lakhs Ninety Thousands Seven Hundred Sixty Four & Paise Fifty) Only.

3. **Details of location from where the material are supplied**: D 16,3 & 4, TTC Industrial Area, MIDC Turbhe, Navi Mumbai (GSTIN - 27AACCE0200B1ZO)

4. **Make & Model**: Make & Model of items will be as per your offer and accepted by the technical deptt. Make of some items is detailed below:

Item	Make
PM 10 Analyzer	Environnement SA India Pvt. Ltd. (MP101M)
UPS	Alpha
Computer	Acer

Refer Annexure – T1 to T3 for TPS & detailed Technical Specifications.

5. **Price**: The above price is on FOR Destn. basis and firm till completion of supplies in all respect.

6. **Price Certificate:**
You must submit a price certificate in all your invoices in the following format for all items:- "*It is certified that the prices, indicated in this invoice is not higher than the amount billed to other Govt. organizations / PSUs / Private Organizations during the contract period.*"

7. **Price Fall Clause:**
You must submit the following certificate along with the bill(s) – "*The Bidder undertakes that it has not offered to supply / supplied / is not supplying same or similar product / systems or sub systems at a price lower than that offered in the present bid in respect of any Organization / Ministry / Department of the Govt, of India or Coal India Ltd. and /or its Subsidiaries or other PSU or any other private organization during the currency of the contract and if it is found at any stage that same or similar product / systems or sub systems was supplied by the bidder to any Organization / Ministry / Department of the Govt, of India or Coal India Ltd. and /or its Subsidiaries or other PSU or any other private organization at a lower price during the currency of the contract, then that very price will be applicable to the present case and the difference in the cost would be refunded by the bidder to buyer, if the contract has already been concluded.*"

8. **GST**: Will be paid extra as legally applicable within the stipulated delivery period against documentary evidence. Current rate applicable of IGST @ 18% for the ordered item. You shall raise GST compliant invoice enabling CCL to avail Input Tax Credit as per GST rules. In the instance if Input Tax Credit is not made available to CCL the same shall be deducted from your Bills. The HSN code applicable on the ordered items are as provided in clause no. 1. The GST Invoice shall clearly indicate the HSN codes for the ordered items. The GST registration number applicable for the supplies to be made by you which shall be mentioned in the GST invoice is: **27AACCE0200B1ZO**.

9. **Taxes & Duties**: In case of any increase in Taxes and Duties up to the stipulated delivery period, the same shall be reimbursed by the Company on production of documentary evidence in support of payment actually made to the concerned authorities. In case of any increase in Taxes and Duties after the expiry of stipulated delivery period, such increase will be borne by you.

10. **Packing & Forwarding** : NIL / Inclusive

11. **Freight & Insurance** : NIL / Inclusive

12. **Transportation**: NIL/ Inclusive
It is incumbent on the supplier to transport the contracted materials/supplies through registered common carriers only and documentation should be done as per provision of the carriage by Road Act, 2007. Any transportation of goods through unregistered common carries is illegal.

13. **Delivery Schedule**: All PM10 analyzers to be supplied within three (03) months from the date of issue of Supply Order. The bidder should be in a position to supply the total quantity/number for which the supply order is issued in specified delivery period.

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N.B: No material shall be supplied beyond the specific delivery period unless amendment for the extension for delivery period is obtained from the purchaser, i.e. CCL, (Supplies made without obtaining extension of delivery period shall be liable for non-acceptance at the stores). However, early delivery will be preferred. The delivery shall be on FOR destination basis. Safe arrival of materials up to destination shall be the responsibility of the supplier. The delivery period will be counted from the date of issue of order Failure to supply the tendered item(s) within the delivery period will attract liquidated damages as per the relevant clause of NIT.

14. **Installation & Commissioning**: Installation & Commissioning to be done by you within 30 days from the date of delivery.

15. **Training:** Comprehensive hands-on training to CCL employee for one week for operation and Preventive maintenance.

16. **Paying Authority: HoD (Finance/Corporate), CCL HQ, Ranchi / AFM, HQ, CCL**
(N.B.: *Payment of TCS to the firm, if applicable, shall be taken care by the paying authority at the time of bill payment as per "Guidelines under section 194-O (4) and section 206C (1-I) of the Income Tax Act, 1961- reg." Dated. 29.09.2020*)

17. **Inspection:** Final Inspection of the consignment will be carried out at the destination stores by HOD (E&F) or his authorized representative (ENVIRONNEMENT Engineer of the Area) which will be arranged by the consignee on receipt of stores.

18. **Consignee Details**:

Sl. No.	Consignee Name & Address	Quantity (No.)
1	Depot Officer Regional Stores, Kathara Area, CCL, P.O. Jarangdih, Dist: Bokaro-829113 Jharkhand	4
2	Depot officer Regional Stores, Dhori Area, CCL, PO Makoli, Dist.-Bokaro-829 144 Jharkhand	2
3	Depot officer Regional Stores, NK Area CCL, P.O: Dakra Distt.: Ranchi, PIN-829210 Jharkhand	2
4	Depot officer Regional Stores, Argadda Area, Ramgarh District, Jharkhand	2
5	Depot officer Regional Stores, Parej, Hazaribagh Area, CCL, PO: Ghatotand, Distt: Ramgarh, PIN-825314 Jharkhand	1
6	Depot officer Regional Stores, Saunda, Barka sayal Area, CCL, P.O. Saunda, Dist:- Ramgarh - 829126 Jharkhand	1
7	Depot officer Regional Stores, Piparwar Area, Chatra District, P.O. Bachra Jharkhand 829201 (04 nos. for Magadh & Amrapali Area & 03 nos for Piparwar Area)	7
8	Depot officer Regional Stores, Kuju, Kuju Area, CCL, AT + PO: Kuju, Dist-Ramgarh, PIN: 825316 Jharkhand	2
9	Depot officer Regional Stores, Rajhara Area, CCL, PO-Rajhara, Railway Station: Daltonganj, Distt.: Palamu, PIN-822124 Jharkhand	1
10	Depot officer Regional Stores, Bokaro & Kargali Area, Jarangdih. P.O.: Jarangdih, Dist.: Bokaro - 829113, Jharkhand	1
11	Depot officer Regional Stores, Giridih Area, Giridih District, Jharkhand	1
12	Depot officer Regional Stores, Rajrappa Area, P.O.Rajrappa, Distt. Ramgarh Pin - 829150 (Jharkhand)	1

19. **Terms of Payment:**
a) **80% payment** along with full taxes and duties may be released within 21 days after delivery and acceptance of the equipment by the consignee and receipt and acceptance of performance bank guarantee.
b) **Balance 20% payment** shall be released within 21 days after successful installation & commissioning (including training) of the equipment.

The payment shall be made by "Electronic Fund Transfer (EFT)" or e-payment as per the details furnished in the e-payment mandate (**Refer Annexure - G**).

20. **Submission of Bills:** For payment in Indian Rupees, the supplier will submit the following documents along with bills to the paying authority:

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a) Four copies of the Supplier's invoice, Pre-Receipted and Stamped showing Contract Number, Goods description, quantity, unit price, total amount and GSTIN of Ultimate Consignee.
b) Receipted Challan / Consignment Note of all the consignments.
c) Manufacturer's Test & Inspection Certificate.
d) Manufacturer's Warranty /Guarantee Certificate as per the guarantee/warranty clause.
e) Lowest Price Certificate.
f) Any other document(s) required as per contract.

Apart from above documents, following documents are to be submitted along with the supply to the consignee(s):

i. One copy of the bill / GST compliant Invoice as the case may be.
ii. Challan.
iii. Packing list in original giving details of bill of materials.
iv. Consignment note / RR/ PWB in original.
v. Warranty / Guarantee certificate and fitment certificate (wherever applicable) in original.
vi. Manufacturers test certificate in original (wherever applicable) as per supply order terms.
vii. DGMS / BIS / Pre dispatch inspection certificates / any other document, if required as per the contract.
viii. As per provision of section 171 of GST Act 2017.an undertaking that "Any extra benefit of input tax credit to the supplier in future shall be passed on to the recipient.
ix. User manual
x. Layout drawings and detailed technical descriptions of PM10 analyzer
xi. Calibration and testing Certificate
xii. Applicable Standards Certificate
xiii. Calibration procedures & Calibration schedule
xiv. Maintenance procedures & schedule.
xv. Standard Operating procedure for Analyser

21. **Input Tax Credit**: CCL is entitled to avail input tax credit on account of GST, SGST, IGST, GST CESS for indigenous products. Hence, set off allowed against CGST, SGST, IGST as per relevant tax act shall be considered for determining tender status for which bidders shall agree to submit following documents, at the time of supply, along with their bills for enabling CCL to input tax credit.

a) **Invoice issued by the supplier should contain following elements as per Section 31 of CGST Act, 2017 along with Rule 46 and 47 of CGST Rule, 2017;**

- Name, address and GSTIN of the supplier;
- A consecutive serial number (not exceeding sixteen characters) containing only alphabets and/or numerals, unique for a financial year; (should not be hand-written)
- Date of its issue;
- Name, address and GSTIN/ Unique ID Number, if registered, of the recipient;
- Name and address of the recipient and the address of delivery, along with the name of State and its code, if such recipient is unregistered and where the taxable value of supply is fifty thousand rupees or more;
- HSN code of goods or Accounting Code of services;
- Description of goods or services;
- Quantity in case of goods and unit or Unique Quantity Code thereof;
- Total value of goods or services;
- Taxable value of goods or services taking into account discount or abatement, if any;
- Rate of tax (CGST, SGST or IGST);
- Amount of tax charged in respect of taxable goods or services (CGST, SGST or IGST);
- Place of supply along with the name of State, in case of a supply in the course of inter-State trade or commerce;
- Place of delivery where the same is different from the place of supply;
- Whether the tax is payable on reverse charge;
- the word "Revised Invoice" or "Supplementary Invoice", as the case may be, indicated prominently, where applicable along with the date and invoice number of the original invoice; and
- Signature or digital signature of the supplier or his authorized representative

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No: 010:01:1:03:20:047 Dated: 22.10.2020

While Supply and raising invoice, you shall comply with all provisions of the Goods & Services Tax Act 2017:

a. The tax invoice raised by the supplier against the services rendered on or after the appointed day must comply of relevant GST Acts, rules & notifications made there-under and should bear the GSTIN 20AAACC7476RHZT of CCL in case of supply to Areas/units of CCL within the state of Jharkhand.
b. The CGST & SGST, or IGST and GST (Compensation to state tax), as applicable, shall be paid extra against submission of proper Tax invoice, as referred above, by the supplier so that CCL could be able to avail Input tax credit of such CGST & GST or IGST and GST (compensation to state cess) reflected in the invoice.
c. If CCL fails to claim Input Tax Credit(ITC) on eligible Inputs and Capital Goods or the ITC claimed is disallowed due to failure on the part of supplier of goods and services in incorporating the tax invoice issued to CCL in its relevant returns under GST, payment of CGST & SGST or IGST, GST (Compensation to State) Cess shown in tax invoice to the tax authorities, issue of proper tax invoice or any other reason whatsoever, the applicable taxes & cess paid based on such Tax invoice including Interest and penalties, if any, as per GST Act, shall be recovered from the current bills or any other dues of the supplier.
d. The amount of CGST & SGST or IGST and GST Cess, as indicated in the Tax Invoice shall be paid only when they appear in GSTR 2A of CCL and the supplier has filed the valid return in accordance with the provisions of the GST Act and the rules made there-under.
e. Where any differential amount is payable to the service provider on account of revision in price or escalation etc or any other reason in relation to service provided before the appointed date, the Tax Invoice or debit note thereof shall be issued by the service provider in compliance of provisions/rules under GST.
f. Similarly, where any differential amount is recoverable from the service provider on account of downward revision in price or due to any other reason in relation to service provided before the appointed date, the credit note thereof shall be issued by the service provider in compliance of provisions/rules under GST.
g. In the event of any additional tax liability accruing on the supplier of services due to classification issue or for any other reason, the liability of CCL shall be restricted to the amount of GST charged on the original tax invoice issued by the supplier.
h. Subsequent amendment(s) by Government(s) in CGST/SGST/IGST/UTGST and GST compensation to states Acts and rules shall become applicable.
i. E-way Bill: The a-way bill required in connection with supply of goods or services, if any, shall be arranged by the supplier/vendor. However, the E-way bill will be arranged by CIL/Subsidiary if the supplier/vendor is unregistered one or if provisions of the relevant Act and the rules made there under specifically states that the E-way bill is required to be issued by recipient of goods.
j. In the event of recovery of any claim towards LD Charges, Penalty, fee, fine or any other charges from the supplier/vendor, the same will be recovered along with the applicable GST and the amount shall be adjusted with the payment to be made to the supplier/vendor against their bill/invoice or any other dues. Further Earnest Money/Performance Security forfeited will be inclusive of GST.
k. TDS: The TDS, if applicable, shall be made at applicable rate from the payment made or credited to the supplier against tax invoice issued in relation to supply of services on or after the appointed day.
l. In reference to relevant tax clause of bid document regarding payment/recovery on account of any new/increase/decrease in tax, the provisions under GST [CGST/SGST/IGST/UTGST/GST Compensation Cess Act and Rules and subsequent revisions by Government] shall become applicable in the contract.
m. The bidder shall submit an undertaking that any extra benefit of ITC in future shall also be passed on to CCL.
n. In case of successful bidder(s), if at the time of supply, it is found that Input Tax Credit Invoice (Credit available to CCL on this account) is less than the "Input Tax Credit Amount" declared in the Price Bid, the differential amount between the two shall be recovered from the Supplier. It will be the responsibility of the supplier to provide all documents to CCL required to claim Input Tax Credit as per the GST Rules.
o. In case of failure of the supplier to comply GST provisions for availing ITC (by CCL), the supplier has to pay the amount of ITC to CCL or CCL will have the right to recover the same from any of the payments due to the supplier.
p. TCS: Payment of TCS to the firm, if applicable, shall be taken care by the paying authority at the time of bill payment as per "Guidelines under section 194-O (4) and section 206C (1-I) of the Income Tax Act, 1961- reg." Dated. 29.09.2020.

(N.B. : In case of failure of the supplier to comply GST provisions for availing ITC (by CCL), the supplier has to pay the amount of ITC to CCL or CCL will have the right to recover the same from any of the payments due to the supplier.)

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No: 010:01:1:03:20:047 Dated: 22.10.2020

22. **Security Deposit:**

a) The bidder will be required to deposit Security Money equivalent to **Rs. 27,09,077/- (i.e. *Rs. 25,37,770/- towards equipment + Rs. 1,71,307/- towards AMC for total 25 sets*)**, in the form of Bank Draft drawn in favour of **Central Coalfields Ltd. payable at SBI, CCL CAMPUS Branch, Ranchi** (JH) or at any scheduled bank located at Ranchi (JH), or in the form of Bank Guarantee of any Scheduled Bank / Nationalized Bank in the prescribed format of CCL enclosed as **Annexure-E** within 15 days from date of placement of order.

b) The SDBG shall remain valid up to 3 months after completion of supplies and acceptance of materials by the consignee in case of supply contracts and in case of contracts for equipment involving installation and commissioning, 3 months after the supply, installation and commissioning & training of all the equipment covered in the contract.

c) Security Deposit may be converted into Performance Bank Guarantee (PBG) wherever PBG is required at the option of the supplier. At the time of conversion of security deposit into PBG, it should be ensured that the amount of PBG should not be less than 10% of landed value of order. Wherever Security Deposit is converted into PBG, the operation of such SDBG/ Performance BG shall be guided by Performance Bank Guarantee Clause of the order.

d) Bidder submitting Bank Guarantee towards Security Deposit cum Performance Bank Guarantee shall submit the same in Performance BG format clearly indicating security deposit cum performance bank guarantee. In such case the amount of PBG should not be less than 10% (ten percent) of the landed value of the order. Validity period of the Bank Guarantee shall cover the period of Security deposit as well as that of performance bank guarantee.

e) The Bank Guarantee (BG) issued by Issuing bank on behalf of the supplier in favour of "Central Coalfields Ltd' shall be in paper form (Stamp Paper) as well as issued under "Structured Financial Messaging System". The details of beneficiary Bank for issue of BG through SFMS Platform are furnished below:-

Name of Beneficiary & his details	Name	Central Coalfields Ltd
	Hqrs/Area	**Hqrs**
	Department	**Materials Management**
Beneficiary bank and branch address	**Bank A/C No**	**10106155123**
	Customer ID	80288731402
	Name of Bank	State bank of India
	Branch & Address	SME Branch, Doranda, Ranchi-834002
	SFMS/IFSC Code	SBIN0009620

The above particulars are to be incorporated by the issuing bank properly while issuing BG under SFMS mode to avoid any problem in future.

f) Security Deposit will be released within 30 days after successful installation, commissioning & training and on receipt of confirmation of Performance Bank Guarantee(s) for all the equipment covered in the contract in case of contracts for equipment and all those items / goods involving installation and commissioning and PBG.

23. **Guarantee/Warranty Parameter:** The Supplier warrants that the Goods supplied under the Contract are new, unused, of the most recent or current models and that they incorporate all recent improvements in design and materials unless provided otherwise in the Contract. The Supplier further warrants that all Goods supplied under this Contract shall have no defect arising from design, materials or workmanship or from any act or omission of the Supplier that may develop under normal use of the supplied Goods in the conditions prevailing in the purchaser's country. **This warranty shall remain valid for twelve (12) months from the date of Commissioning of the equipment.** The Purchaser shall promptly notify the Supplier in writing of any claims arising under this warranty. The Supplier shall, within thirty days, repair or replace the defective Goods or parts thereof, free of cost at the ultimate destination. The Supplier shall take over the replaced parts/Goods at the time of their replacement. No claim whatsoever shall lie on the Purchaser for the replaced parts/Goods thereafter. If the Supplier, having been notified, fails to remedy the defect(s) within thirty days, the Purchaser may proceed to take such remedial action as may be necessary, at the Supplier's risk and expense and without prejudice to any other rights which the Purchaser may have against the Supplier under the Contract.

In case the availability of PM10 analyzer, within warranty period of 01 year, goes below 85%, the duration of the warranty period shall be suitably extended.

24. **Marking:** The manufacturer's distinct identification mark /symbol and also the part number (if any) should be clearly embossed /engraved /punched on the assembly at a visible place which is not subject to normal wear and tear.

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25. **Technical Support and Service:** You agree for rendering prompt technical support and services to ensure fitment, proper usage, maintenance and satisfactory performance of supplied spares. You also agree to arrange quarterly visit of your service personnel for smooth functioning of the supplied items.

26. **Performance Bank Guarantee (PBG) in case of equipment:**

a) The bidder will be required to deposit Performance Guarantee equivalent to **Rs. Rs. 27,09,077/- (i.e. *Rs. 25,37,770/- towards equipment + Rs. 1,71,307/- towards AMC for total 25 sets*)**, to cover the warranty/guarantee period.

b) The Performance Bank Guarantee shall be issued by a RBI scheduled bank in India in the format attached as **Annexure F** on a non-judicial stamp paper.

c) To arrive at the value of the PBG, the order value should be calculated as per the following guidelines: For arriving at the value of PBG to be submitted for Indigenous Orders, the order value will be arrived at by adding all the Taxes & Duties such as Excise Duty, Sales Tax/ VAT, or GST, as applicable to the FOR Destination Price of the equipment (along with accessories), AMC including taxes and duties etc. as applicable on the date of opening of price bid.

d) PBG (s) may be submitted equipment wise also. For this purpose, the value of each equipment will be worked out by dividing the total value of contract for a particular item of NIT, worked out as per provisions contained in NIT, by the number of equipment ordered for that particular item.

e) PBG issued by any scheduled Bank in the prescribed format, for each equipment, valid for 15 months (90 days beyond 1 year warranty) from the date of commissioning of the equipment for 10% value of the equipment (along with accessories), AMC including taxes and duties etc. to the FOR Destination price of the equipment on order.

f) The PBG for warranty period will only be released after submission of PBG for AMC at respective areas. The release of the Performance Bank guarantee(s) after above indicated period, shall be subject to satisfactory performance of the equipment/ items during the warranty period and fulfillment of contractual obligations failing which, action for further extension or encashment of PBG, as deemed suitable shall be taken. The Performance Bank Guarantee shall be released after expiry of validity period if no claim is pending, with the approval. On completion of Performance guarantee period / criteria, the firm should submit a written request to the supply order signing authority for release of PBG."

g) The Bank Guarantees (BG) issued by issuing bank on behalf of the supplier/s in favour of "Central Coalfields Limited" shall be in paper form (Stamp Paper) as well as issued under "Structured Financial Messaging System". The message will be sent to the beneficiary bank through SFMS. The details of beneficiary Bank of issue of BG through SFMS Platform are furnished below:-

Name of Beneficiary & his details	Name	Central Coalfields Ltd
	Hqrs/Area	**Hqrs**
	Department	**Materials Management**
Beneficiary bank and branch address	**Bank A/C No**	**10106155123**
	Customer ID	80288731402
	Name of Bank	State bank of India
	Branch & Address	SME Branch, Doranda, Ranchi-834002
	SFMS/IFSC Code	SBIN0009620

h) Original copy of the Bank Guarantee issued by the issuing Bank shall be sent by the Issuing Bank to the Procurement Entity, Central Coalfields Limited.

i) The PBG will be released after successful completion of Performance guarantee period/criteria. Bidder submitting Bank Guarantee towards Security Deposit cum Performance Bank Guarantee shall submit the same in Performance BG format clearly indicating security deposit cum performance bank guarantee. In such case the amount of PBG should not be less than 10% (ten percent) of the landed value of the order. Validity period of the Bank Guarantee shall cover the period of Security deposit as well as that of performance bank guarantee.

27. **Annual Maintenance Contract (AMC) (Non-Comprehensive):** AMC for a period of 5 (Five) Years from the date of satisfactory completion of 01 (One) year warranty period. Area Environment Officer of respective Area will operate the AMC at area level. For detailed terms & conditions of AMC, **Refer Annexure T4.**

28. **Special Instruction:** One copy of the challan and invoice showing dispatch details and other documents must be sent to this office and the Office of the DGM (E&F)/HOD, CCL, Ranchi to know the dispatch particulars.

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29. **Liquidated Damages Clause**:Refer Clause 4 of Special Conditions of Contract (SCC) attached at **Annexure B**

30. **Force Majeure Clause:** Refer Clause 22 of General Conditions of Contract attached at **Annexure A**.

31. **Integrity Pact:** You have signed Integrity Pact which is enclosed as **Annexure-D.** The Independent External Monitor nominated for implementation of the Integrity Pact for this tender is:

Name	Address	Contact Details
Shri Devendra Kumar Pathak, IPS (Retd.)	L/G4, Amrapali Sapphire, Sector – 45, Noida (U.P.) – 201303	pathak56515@gmail.com
Shri Srinivasan Rangarajan, IRSME (Retd.)	C-1, Rail Nagar, Podanur, Coimbatore – 641 023	ramasalperi@gmail.com

32. **Jurisdiction:** The Courts at Ranchi in Jharkhand State only will have the jurisdiction to deal with and decide any legal matter or dispute whatsoever arising out of our contract.

33. **Order Acceptance:** A copy of this order may please be returned duly stamped and signed within 20 days from the date of supply order as a token of acknowledgement and acceptance of the contract, otherwise it will be presumed that you have accepted the contract for execution.

All other terms & conditions will be as per the General Conditions of the Contract (GCC) as well as Special Conditions of the Contract (SCC) of the supply of stores of Central Coalfields Limited.

Yours faithfully,
For & on behalf of Central Coalfields Limited

22/10/2020
(Himanshu Dhumash)
Dy. Manager (Pur)

22/10/2020
(S.K. Sahay)
Chief Manager (MM-Pur)

Enclosures:

1. Technical Parameter Sheet – Annexure 'T1'
2. Bill of Material accepted by Technical Deptt. – Annexure 'T2'
3. Layout Drawing & Detailed Technical Description of PM10 Analyser – Annexure 'T3'
4. AMC Format – Annexure 'T4'
5. General Conditions of the Contract – Annexure 'A'
6. Special Conditions of the Contract – Annexure 'B'
7. Letter of Bid – Annexure 'C'
8. Signed Pre-Contract Integrity Pact – Annexure 'D'
9. Format of Bank Guarantee for Security Deposit – Annexure 'E'
10. Format of Bank Guarantee for Performance – Annexure 'F'
11. E-Payment Mandate – Annexure 'G'

Copy forwarded to:-

1. GM (MM-Pur)/HOD, CCL, Ranchi
2. GM (S&IC)/HOD, CCL, Ranchi – This is in reference to indent reg. no. GM(S&IC)/Ind./MB/Regn./20-21/10 Dated 27.05.2020
3. DGM (E&F)/HOD, CCL, Ranchi – with a request to advise the respective Area Environment Officer to execute & operate AMC at area level as per the terms & conditions of AMC.
4. HoD (Finance/Corporate), CCL HQ, Ranchi / AFM, HQ, CCL
5. TS to D(T)(P&P), CCL, Ranchi
6. Depot Officers, Regional Stores, Kathara Area, CCL, P.O. Jarangdih, Dist: Bokaro-829113 Jharkhand / Dhori Area, CCL, PO Makoli, Dist.-Bokaro-829 144 Jharkhand / NK Area CCL, P.O: Dakra Distt.: Ranchi, PIN-829210 Jharkhand / Argadda Area, Ramgarh District, Jharkhand / Parej, Hazaribagh Area, CCL, PO: Ghatotand, Distt: Ramgarh, PIN-825314 Jharkhand / Saunda, Barka sayal Area, CCL, P.O. Saunda, Dist:- Ramgarh - 829126 Jharkhand / Piparwar Area, Chatra District, P.O. Bachra Jharkhand 829201 / Kuju Area, CCL, AT + PO: Kuju, Dist-Ramgarh, PIN: 825316 Jharkhand / Rajhara Area, CCL, PO-Rajhara, Railway Station: Daltonganj, Distt.: Palamu, PIN-822124 Jharkhand / Bokaro & Kargali Area, Jarangdih, P.O.: Jarangdih, Dist.: Bokaro - 829113, Jharkhand / Giridih Area, Giridih District, Jharkhand / Rajrappa Area, P.O.Rajrappa, Distt. Ramgarh Pin - 829150 (Jharkhand)

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16. Area Finance Managers, Kathara Area, CCL, P.O. Jarangdih, Dist: Bokaro-829113 Jharkhand / Dhori Area, CCL, PO Makoli, Dist.-Bokaro-829 144 Jharkhand / NK Area CCL, P.O: Dakra Distt.: Ranchi, PIN-829210 Jharkhand / Argadda Area, Ramgarh District, Jharkhand / Parej, Hazaribagh Area, CCL, PO: Ghatotand, Distt: Ramgarh, PIN-825314 Jharkhand / Saunda, Barka sayal Area, CCL, P.O. Saunda, Dist:- Ramgarh - 829126 Jharkhand / Piparwar Area, Chatra District, P.O. Bachra Jharkhand 829201 / Kuju Area, CCL, AT + PO: Kuju, Dist-Ramgarh, PIN: 825316 Jharkhand / Rajhara Area, CCL, PO-Rajhara, Railway Station: Daltonganj, Distt.: Palamu, PIN-822124 Jharkhand / Bokaro & Kargali Area, Jarangdih, P.O.: Jarangdih, Dist.: Bokaro - 829113, Jharkhand / Giridih Area, Giridih District, Jharkhand / Rajrappa Area, P.O.Rajrappa, Distt. Ramgarh Pin - 829150 (Jharkhand)
28. Area Environment Officer, Kathara Area, CCL, P.O. Jarangdih, Dist: Bokaro-829113 Jharkhand / Dhori Area, CCL, PO Makoli, Dist.-Bokaro-829 144 Jharkhand / NK Area CCL, P.O: Dakra Distt.: Ranchi, PIN-829210 Jharkhand / Argadda Area, Ramgarh District, Jharkhand / Parej, Hazaribagh Area, CCL, PO: Ghatotand, Distt: Ramgarh, PIN-825314 Jharkhand / Saunda, Barka sayal Area, CCL, P.O. Saunda, Dist:- Ramgarh - 829126 Jharkhand / Piparwar Area, Chatra District, P.O. Bachra Jharkhand 829201 / Kuju Area, CCL, AT + PO: Kuju, Dist-Ramgarh, PIN: 825316 Jharkhand / Rajhara Area, CCL, PO-Rajhara, Railway Station: Daltonganj, Distt.: Palamu, PIN-822124 Jharkhand / Bokaro & Kargali Area, Jarangdih, P.O.: Jarangdih, Dist.: Bokaro - 829113, Jharkhand / Giridih Area, Giridih District, Jharkhand / Rajrappa Area, P.O.Rajrappa, Distt. Ramgarh Pin - 829150 (Jharkhand)
40. GM (MM), CIL/BCCL/MCL/NCL/ECL/WCL/SECL
47. Shri Devendra Kumar Pathak, IPS (Retd.), L/G4, Amrapali Sapphire, Sector – 45, Noida (U.P.) – 201303
48. Shri Srinivasan Rangarajan, IRSME (Retd.), C-1, Rail Nagar, Podanur, Coimbatore – 641 023.
49. MIS Cell, MM Deptt.

This issues with the concurrence of Sr. Mgr. (Fin-P&P) at Note# 345-346 & approval of GM(MM-Pur)/HOD, CCL at Note# 347 Dt. 22.10.2020 in e-office file E 155738.

Fund certified by Fin-P&P at Note# 355-357 vide Budget Certification no.:
Budget Certified (NEW) vide no. BGT/CB/PP/20-21/155738/1/(98) Date: 22.10.2020
Head: Environmental Activities
Ref. No. (NEW) HQ, DHC, 16(b)
Amount: Rs. 2,53,98,077.20 (Rupees Two Crores Fifty Three Lakhs Ninety Eight Thousand Seventy Seven and Paise Twenty) only.

Fund in respect of payment of AMC charges (Revenue) shall be arranged by the respective Area Environment Officer at the area level as & when required as per terms & conditions of AMC

22/10/2020
Dy. Manager (Pur)

22/10/2020
Chief Manager (MM-Pur)

Photographs showing installation of PM10 analyser at Shivpur Railway Siding

ENCLOSURE 04

<u>SN-3:</u> PP shall justify for considering two different emission factors source for AQIP modelling and further modelling has been conducted only for normative production capacity

&

SN 04: PP shall propose the measures to be taken for reduction of air pollution due to internal and external transportation of mine.

<u>Reply:</u>

In coal mining, different activities contributing to the air emissions are as given below:

1) Drilling in Coal benches.
2) Drilling in OB benches.
3) Blasting in Coal benches.
4) Blasting in OB benches.
5) Truck loading and Unloading of coal & OB.
6) Coal & OB transportation on Haul Roads
7) Coal Transportation to the Siding
8) Wind erosion at ground coal stock & active OB dump.
9) Loading, unloading and wind erosion at Siding.

In order to quantify the emissions from above activities/ sources and predict the impacts, the emission factors from S&T study of CMPDI and AP 42 of USEPA were used.

Source of Emission Factors:

An S&T study titled, "Development of emission factors for various mining machineries & operations in opencast coal mines (EE-27)" was carried out by CMPDI (HQ) during 2002 to 2008.

During this study, emission factors were developed for major activities impacting air quality like Drilling, Loading of coal and OB by Shovel, Unloading of OB, transportation on haul roads and Coal sizing have been developed.

Whereas, emission factor study for activities like blasting, wind erosion could not be carried out due to technological and economic constraints.

Therefore, in order to fill up the gaps in the emission factor data, globalized emission factors generated for surface coal mining activity by USEPA AP 42 have been considered in this study to predict the impact.

Sl. No	Activity	Uncontrolled Emission Factor				Control Factor	Reference of E.F.
		Unit	PM – 2.5	PM -10	TSP		
1	Top soil removal by scrapper	kg/t	0.00058	0.0052	0.029	50 % control when soil is naturally or artificially	AP 42 , USEPA(1998)

						wet.	
2	Drilling in Coal Bench	kg/hole	0.04	0.22	0.83	90 % for fabric filter. 70 % for water sprays.	*Coal S&T Project
3	Drilling in OB Bench	kg/hole	0.11	0.56	2.18	90 % with fabric filter 70 % for water sprays	*Coal S&T Project
4	OB Loading by shovel	kg/t	1.5×10^{-05}	1.4×10^{-04}	7.7×10^{-04}	50% for water sprinkling	*Coal S&T Project
5	OB Unloading	kg/t	6.0×10^{-05}	5.0×10^{-04}	3.0×10^{-03}	50% for water sprinkling	*Coal S&T Project
6	Coal Loading by shovel	kg/t	2.1×10^{-04}	1.5×10^{-03}	7.1×10^{-03}	None	*Coal S&T Project
7	Coal Unloading	kg/t	1.4×10^{-04}	1.23×10^{-03}	7.1×10^{-03}	None	*Coal S&T Project
8	Coal / OB transportation on unpaved haul road	kg/VKT	0.076 Vehicle km traveled (VKT) = (No. of trips) x (distance traveled)	0.53	2.56	50% for mobile water sprinkling& 70% for Fixed sprinkling system	*Coal S&T Project
9	Coal Sizing						
	(a) Primary Crusher	kg/t	0.008	0.056	0.28	Control factor = 99 % for enclosure with dust extraction system	*Coal S&T Project
	(b) Secondary	kg/t	0.02	0.13	0.64	Control factor = 99 % for	*Coal S&T Project

	Crusher					enclosure with dust extraction system	
10	Blasting OB / Coal	kg/ blast	0.03 x E.F. for TSP*	0.18 x E.F. for TSP*	$344(A)^{0.8}$ / $(M)^{1.9}(D)^{1.8}$	None	AP 42 , USEPA(1998)
11	Dozing OB**	kg/hr	0.11 x E.F. for TSP	0.29 x E.F. for TSP	$2.6\ (S)^{1.2}$ /$(M)^{1.3}$	None	AP 42 , USEPA(1998)
12	Dozing Coal#	kg/hr	0.11 x E.F. for TSP	0.29 x E.F. for TSP	$35.6\ (S)^{1.2}$ /$(M)^{1.4}$	None	AP 42 , USEPA(1998)
13	Wind erosion from OB dumps, coal mine pits and coal stockyard	kg/ha/hr	0.008 (exclude contribution of calm period)	0.09 (exclude contribution of calm period)	0.4	50 % for water sprays& 70 % for mist type sprinkling system	AP 42 , USEPA(1998)
14	Pit retention		0 %		50 % for PM -10	Emission Estimation Technique for Mining, version 2.3 , EPA Australia	
15	Unloading point of conveyor belt	Kg/t			0.029	USEPA 1998	

*The average values for Silt(S) and Moisture (M) content in coal and OB were observed as S = 12 %, M = 7 % , For OB, S = 5 % & M = 4 % respectively during an coal S&T Study for "Development of emission factors for various mining machineries &operations in an opencast coal mines"(EE-27).

**For Dozing OB, TSP = = 2.96 kg/hr for S = 5 %, M = 4 %,

#For Dozing Coal, TSP **=** = 46.06 kg/hr for S = 12 %, M = 7 %,

D – depth of drill hole, A – incremental area for blasting

Emission factor for Coal cutting & loading by Surface Miner (Kg/t) = 0.153×10^{-2}

Air Quality Modelling

AERMOD has been used to predict the impact on the ambient air quality of the core and buffer zone of the study area due to mining operations in Amrapali Expansion OCP (Phase-I) with 25 MTPA capacity. The results and discussion are as given below:

Table 01 Predicted Concentrations of PM10

24 Hours average PM_{10} concentration (µg/ m^3)						
Station	**Baseline Conc.**	**Incremental PM_{10} With Existing Control Measures**	**Incremental PM_{10} With Additional Control Measures**	**Total Predicted Conc. With Existing Control Measures**	**Total Predicted Conc. With additional Control Measures**	**Permissible Limits**
	1	2	3	(4)= (1)+(2)	(5)= (1)+(3)	
Site Office	130.08	152	73.9	282.08	203.98	300
Weigh Bridge	118.54	97.22	36.1	215.76	154.64	300
Honhe Village	76	54.1	15.3	130.1	**91.3**	**100**
Shivpur Village	69.62	50	8.2	119.62	77.82	100
Pachra	69	78.1	27	147.1	**96**	**100**
Ursu	69.54	69.61	26	139.15	**95.54**	**100**
Tandwa	77.08	28.82	13.1	105.9	**90.18**	**100**
Bukuru	62.54	30.67	14.2	93.21	76.74	100
Keradari	70.54	21	6.3	91.54	76.84	100

EAC had observed that the total predicted concentration with control measures (Column 5) at 4 stations namely Honhe village, Pachra village, Ursu and Tandwa are on higher side (> 90 µg/ m^3).

Further, the EAC had suggested to re-work on the sources contributing on the above receptors and submit a revised Environmental Management Plan (EMP) in order to mitigate the impact of the proposed activity.

The location plan of 4 villages and corresponding industrial activities marked on the Google Earth is shown in the fig given below.

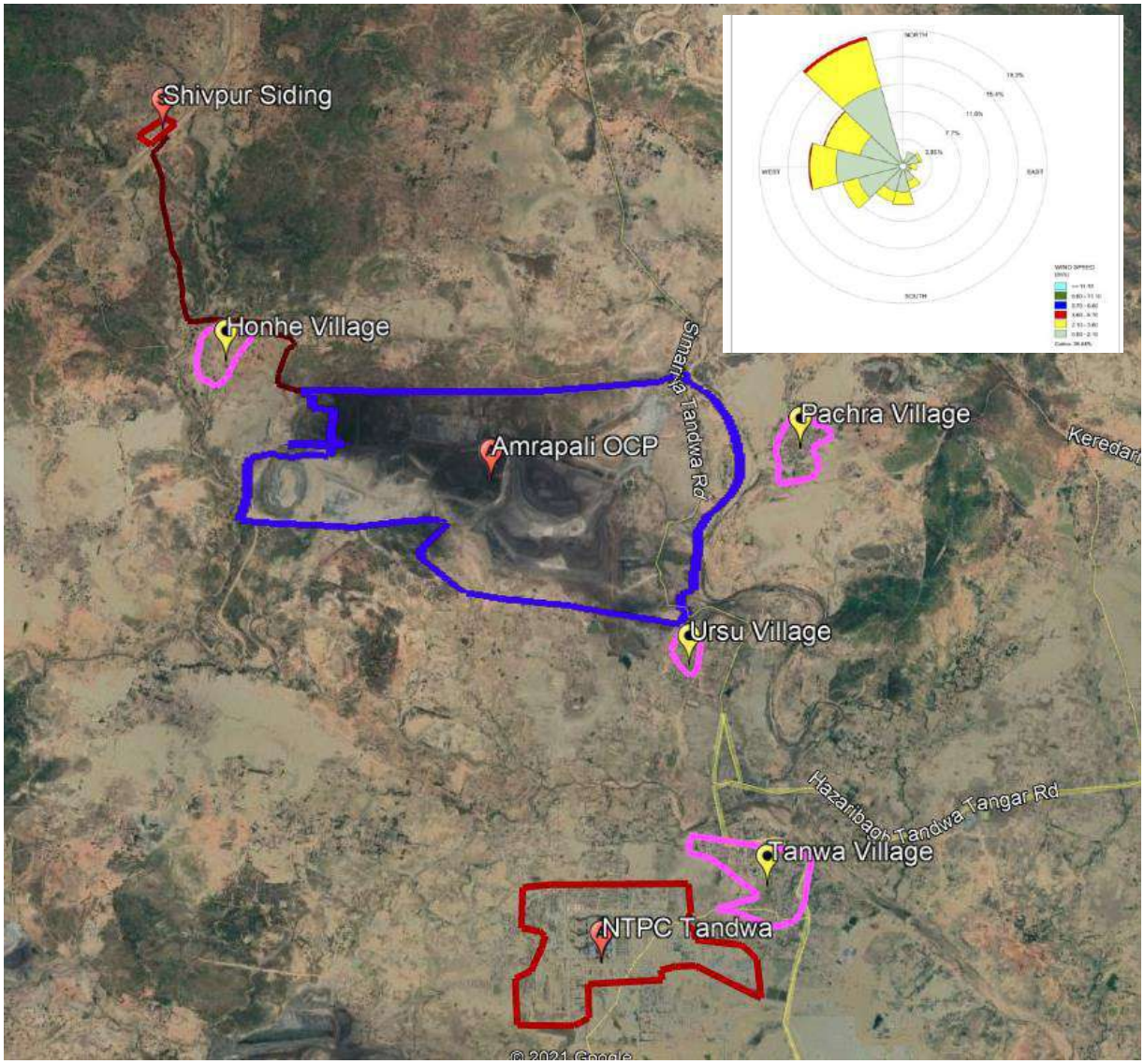


Fig: 01 Windrose Diagram & Source-Receptor Mapping on Google Earth

Table 02 Source Receptor Mapping

SN	Station	Location	Distance from Core Zone	Impact of Proposed Project	Other Sources
1	Honhe Village	Buffer Zone- Upwind	1.20 km	Impact on Air quality due to Coal Transportation road passes adjacent to the village. Impact of mining activity within core zone less predominant.	Cook Stoves and Domestic Activities
2	Pachra	Buffer Zone-Cross Wind	1.20 km	This receptor is majorly impacted due to topography/ nature of terrain.	Cook Stoves and Domestic Activities Major road connecting Pachra and keradari falling within 100 m radius of the receptor
3	Ursu	Buffer Zone-Downwind	0.20 m	Impact due to proximity to the coal mine & coal transportation road.	Cook Stoves and Domestic Activities
4	Tandwa	Buffer Zone-Downwind	3.60 km	It is minimally Impacted due to Coal Mining and allied activities of Amrapali OCP	NTPC Power Plant at a distance of 1.60 km in upwind direction Cook Stoves and Domestic Activities.

1. Honhe Village:

Honhe village falls in the upwind direction of the project area. The coal transportation route passing adjacent to the Honhe village (at a distance of 100 m) is the major source contributing to GLC at Honhe village.

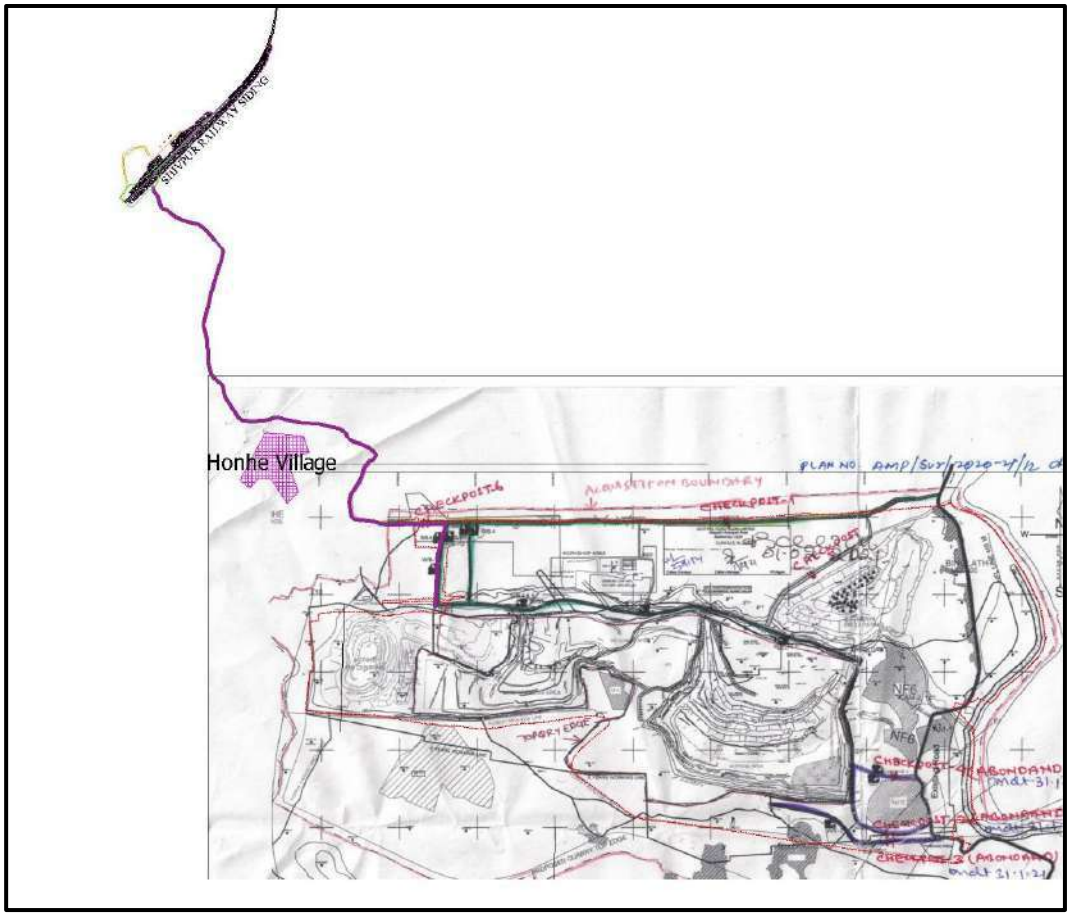


Fig 02: Plan Showing Coal Transportation Road Adjacent to Honhe Village

Following are the additional control measures suggested to bring down the impact of proposed transportation activity on Honhe village.

- Existing coal transportation road will be converted into PCC roads.
- Fixed sprinklers are proposed near Honhe village on coal transportation road
- 2 no. of road sweeping machines will be deployed to remove dust on roads.
- Wind Barriers will be installed on either side of coal transportation road near Honhe village in order to contain the impact of coal transportation on nearby settlement.

2. Ursu Village:

Ursu village falls in the immediate downwind of the project and hence impacted by the mining activities. After a detailed study, it has been identified that the transportation road passing through Checkposts 2, 3 & 4 is a significant contributor of dust pollution at Ursu village. (Refer Fig: 03)

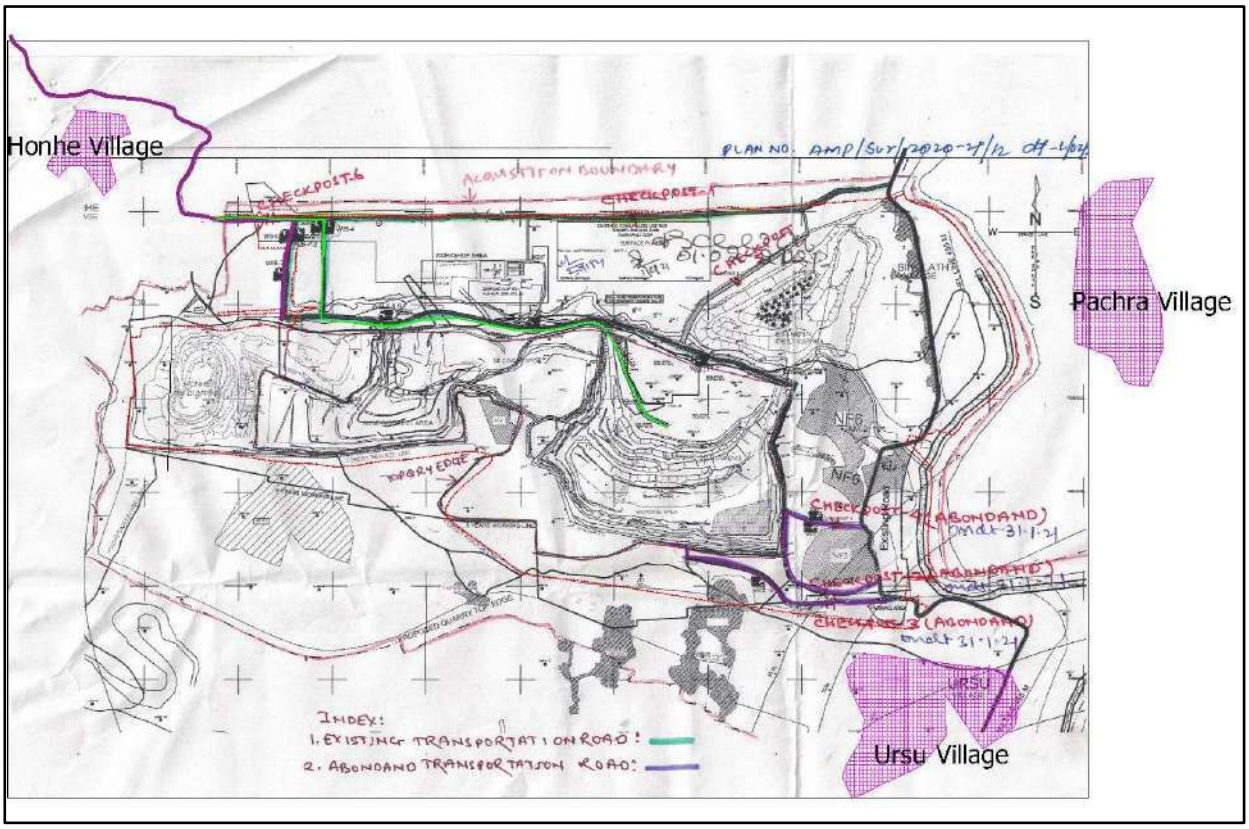


Fig 03: Plan Showing Existing and Abandoned Coal Transportation Road

Hence, as an immediate control measure, this road has been closed/abandoned effectively from 31.1.2021 and an alternate coal transportation away from the habitation is brought into operation as shown in the fig 03.

Photographs showing abandoned Coal Transportation Road

Thus, the impact of the project on Ursu village has been reduced.

Further, a wind barrier of length 1.3 km and height 7 m will be provided between project boundary and Ursu village and 3- tier plantation/ green belt will be developed all along the project boundary to restrict the impact of mining activities on Ursu village.

3. Pachra Village:

Pachra village is located in the eastern direction of the project at an aerial distance of 1.20 km from the project boundary (Refer Fig: 03). Due to the presence of hilly terrain in the south east direction of the project, the predominant downwind direction shifts from south east to the east of project, resulting significant impact on Pachra village.

Additional Control Measures:

1. Wind barrier of dimensions 1.8 km length X 7 m height will be provided all along the eastern boundary of the project.

4. Tandwa village:

Tandwa village is located at a distance of 3.60 km from the project boundary. This village also located adjacent to the NTPC power plant. It has been observed that the impact of proposed project on the air quality of this location is minimal, and the on-going construction activities at NTPC Tandwa could be the major contributor of dust in this village.

However, with the additional control measures suggested above, the impact of the proposed activity can further be minimized.

ENCLOSURE 05

S.No 05: PP shall submit the specific mitigate measures for Dudhmatia Nala flowing through the mining leasehold area. Detailed diversion plan along with its impact on Barki River shall be provide with allocated fund and timeline and likely Impact of mining on Chundru, Garhi river shall be submitted.

Reply:

Details of Nala Diversion

Easterly flowing Dudhmatia nala/ Binglat Nala has been proposed for diversion along the northern boundary of the project.

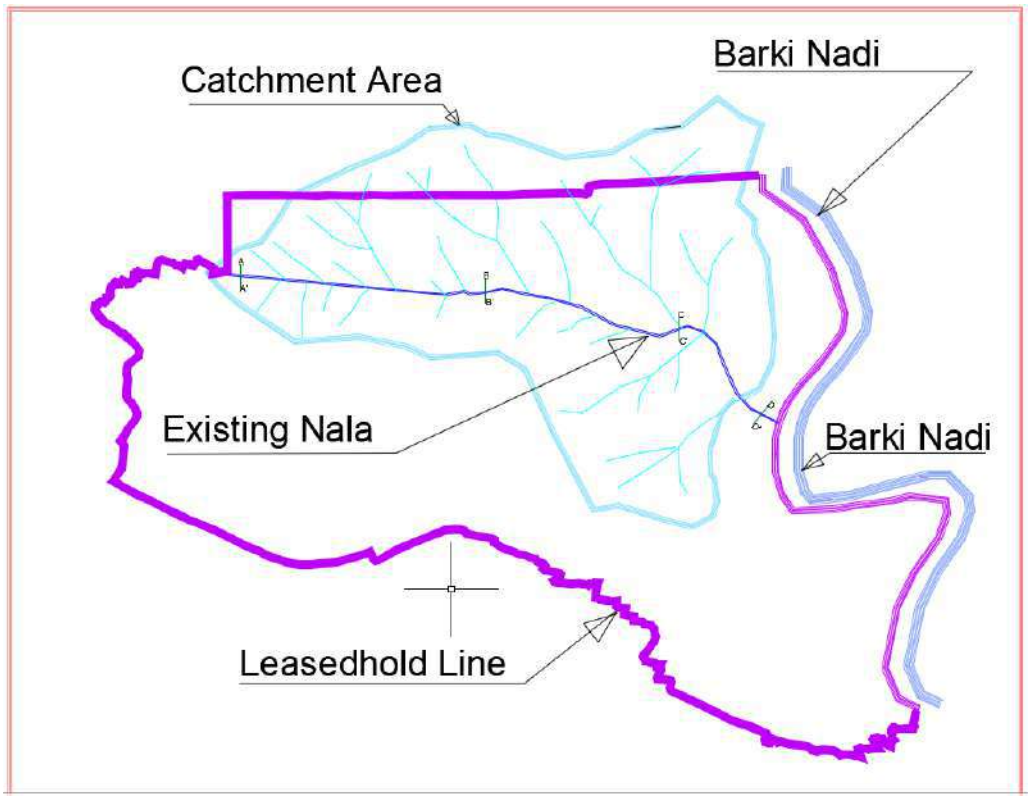
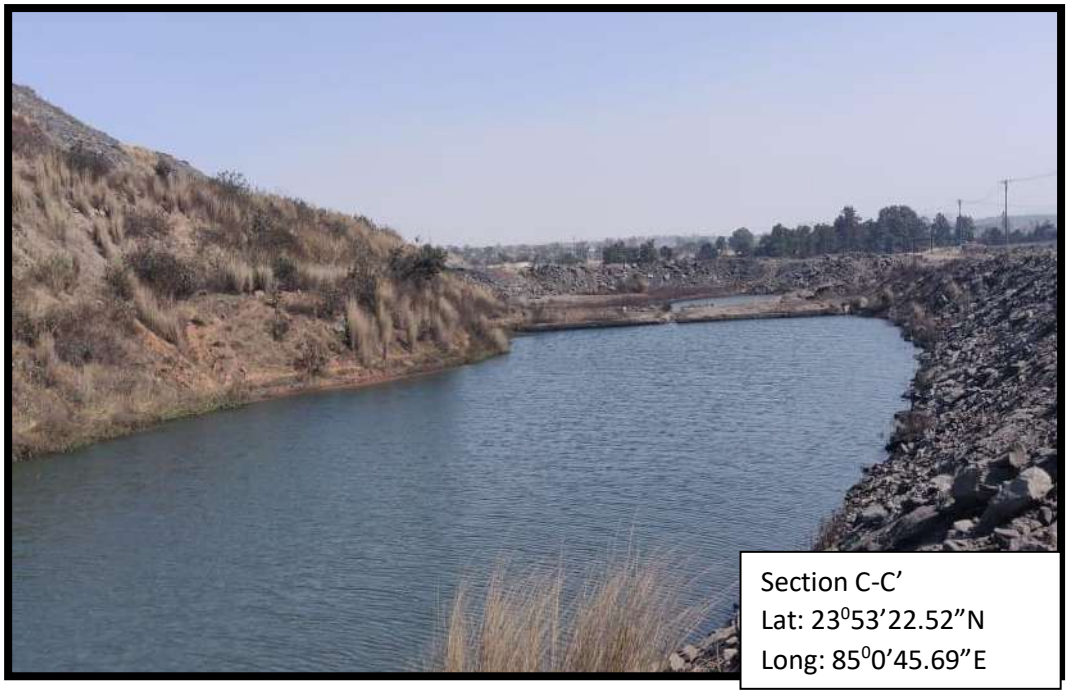


Fig: Plan Showing Existing Course of Nala and Catchment

To depict the present state of nala, the photographs showing course of nala are as given below:

Section B-B'
Lat: $23^0$53'31.66"N
Long: $85^0$0'21.99"E

Fig: C/S of Nala at Section B-B'



Section C-C'
Lat: $23^0$53'22.52"N
Long: $85^0$0'45.69"E

Fig: C/S of Nala at Section C-C'

Fig: C/S of Nala at Section D-D'

Water Quality Study:

In order to assess the impact of Dudhmatia nala on Barki River, water quality analysis has been carried out at following locations.

S.No	Source	Location
1	**Surface Water**	1 Barki River U/S of Amrapali OCP
		2- Dudhmatia Nala Before Conf. into barki River
		3. Barki River D/s of Amp. OCP After conf. with Chundru Nadi

Surface water quality has been measured at 4 locations in the pre monsoon period and the results are as given below.

Table: Surface water Quality

Period: Pre-Monsoon 2020

Surface	**Barki River U/S of Amarpali OCP**			**Dudhmatia Nala before Confluence to Barki River**			**Barki River After Confluence into Chundru nadi**		
Date (m/dd)	**3/26**	**4/19**	**5/14**	**3/26**	**4/19**	**5/14**	**3/26**	**4/19**	**5/14**
Arsenic (as As), mg/l, Max	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002

BOD	<2.00	<2.00	2	<2.00	<2.00	2	2	2	2.2
COD (mg/l)	16	21	18	30	34	36	18	24	22
Cadmium(as Cd), mg/l, Max	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0005	<0.005	<0.0005	<0.0005
Chlorides (as Cl), mg/l, Max	10	8	14	20	22	28	38	32	42
Copper (as Cu), mg/l, Max	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Disolved Oxygen, min.	5	6	5.8	5.6	5.8	5.8	5.4	5.6	5.6
Fluoride (as F) mg/l, Max	0.98	0.76	0.88	1.53	1.18	1.28	1.6	1.36	1.28
Hexavalent Chromium,	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron (as Fe), mg/l, Max	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
Lead (as Pb), mg/l, Max	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nitrate (as NO_3), mg/l, Max	4.54	3.36	6.28	14.22	10.6	10.66	14.46	11.32	16.37
pH value	7.92	7.89	7.84	6.64	6.84	7.06	7.67	7.75	7.55
Phenolic compounds	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium (as Se), mg/l, Max	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Sulphate (as SO_4) mg/l, Max	14	12	32	157	138	134	152	138	112
TDS	198	172	222	386	324	334	364	296	344
TSS	16	14	28	48	36	26	22	24	28
Zinc (as Zn), mg/l, Max	<0.01	<0.01	0.11	0.02	<0.01	0.14	<0.01	<0.01	0.12

From the surface water quality, it can be observed that all the water quality parameters are within the permissible levels.

Existing Control Measures:

1. The course of existing Binglat nala is atleast 60 m away from the present quarry. No obstruction has been created due to mining activity on the course of nala.

2. De-siltation of Nala bed is being carried out before Monsoon. In 2021, de-siltation and deepening of Dudhmatia Nala has been carried out with an expenditure of Rs. 5.80 Lakhs.
3. Check dam has been constructed on Dudhmatia nala before confluence into Barki river for silt removal and artificial ground recharge.
4. Water quality monitoring of this nala is being done periodically.

Alignment of Diverted Channel:

After study of the topographical & contour map, mining & geological condition and other technical and mining parameters, the nallah will be diverted from the north of Binglat OB dump as shown in the plan below. Length of diverted nala is around 1500 m.

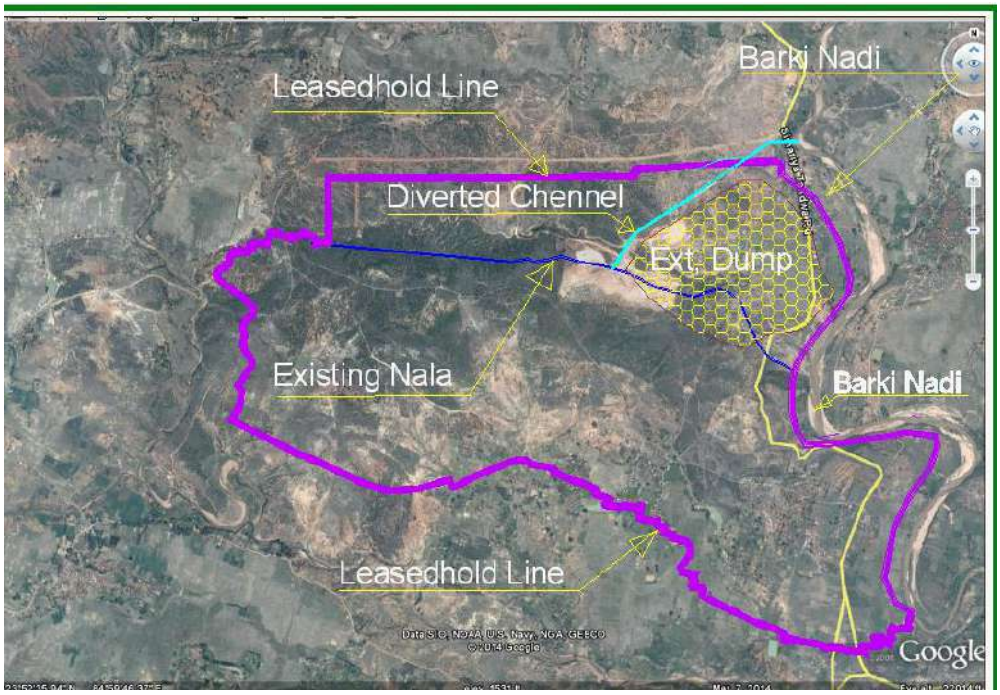


Fig: Proposed Alignment of Diverted Channel

Cross Sectional Profile of the Diverted Channel

Following drawing shows the general profile of channel at different section of along the diverted course of alignment.

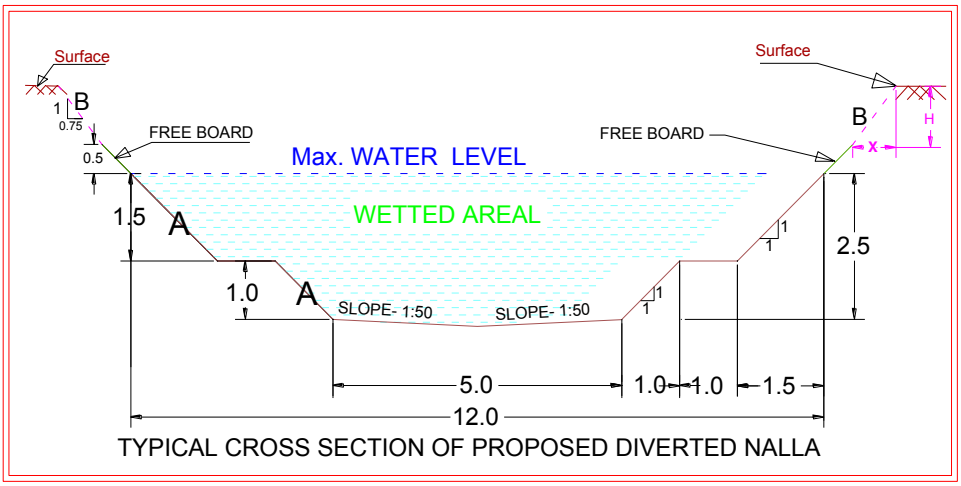


Fig: Typical C/S of the Channel

The application for permission of diversion of Dudhmatia Nallah has also been submitted to EE (Irrigation Dept.) on 04.02.2021.

Protection Measures

- Garland drain of length 1500 m, in between the OB dump and diverted nala, will be provided to check the run-off coming directly from embankment.
- Embankments will be provided all along the course of Nala (length 3100 m X Height 3 m) and plantation will be carried out.
- Check dams have been proposed on the Course of nala in order to arrest the silt.
- Before monsoon bed of channel should be cleaned with proper gradient.

Proposed Capital Cost for Nala Diversion and Protection Measures

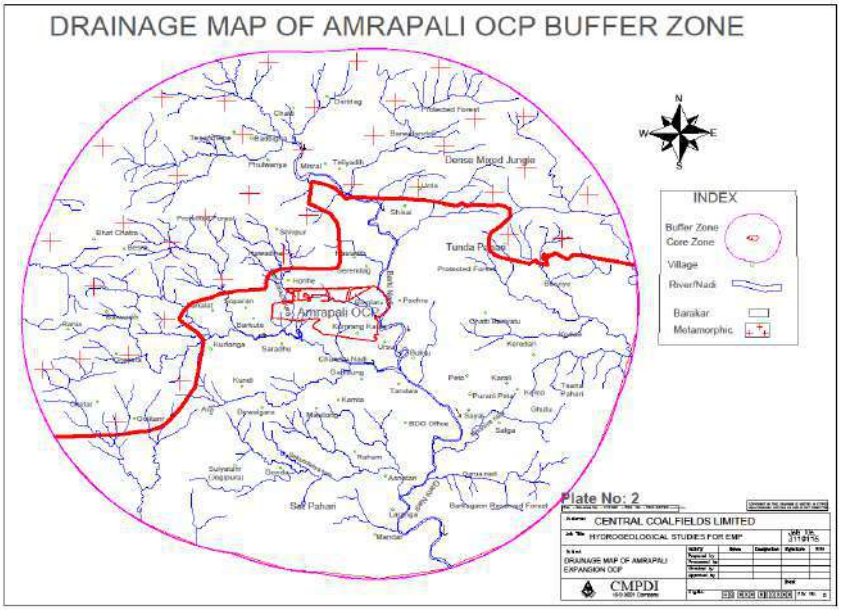
Year	Activity	Details	Estimated Capital Cost in Rs. Lakhs	Tentative time line of Completion
2021	Diversion of Dudhmatia Nala	1500 m nala Diversion along the northern boundary of project	164.36 Lakhs	May-21
	Garland Drain	In between the OB dump and diverted nala of Length 1500m	60 Lakhs	May-21
	Embankment	Earthen Embankment with stone pitching and Toe wall along nala of Length 3100 m and Height 3 m	210 Lakhs	Jun-21
	Plantation	3 Tier Plantation on embankments	90 Lakhs	Jun-21
	Check-dams	Construction of Check-dam across Binglat Nala	53.40 Lakhs	Jun-21

Impact of Mining on Chundru, Barki And Garhi Nadi

Impact on Drainage & Topography

Mining of coal by **open cast method** causes changes in topography. The change of ground relief in a mine area influences the local drainage. This may alter the drainage at the micro level. Care is taken during mining activity to avoid any serious damage to surface water bodies. **The important drainage controlling the project area and its buffer zone is Garhi nadi and its two major tributaries Barki nala and Chundru nadi.** The eastern surface boundary has been fixed leaving a surface barrier of 60m from Barki River, flowing from north to south and carries the run-off to the master drainage Garhi Nadi flowing towards south. The western surface boundary has been fixed leaving a surface barrier of 60m from Bahut Chuha nala, which is the tributary of easterly flowing Chundru nadi. Both these nadi i.e. Barki and Chundri nadi, which are the tributaries of Garhi nadi, meet in the south-east of the project at a distance of more than 500 m. A few 1st order seasonal streams of these tributaries originate within the mine area. Hence with progress in the mining activity, the catchment area in the upstream region of these

nalas will be disturbed but water will be collected (during monsoon) in the mine sump arising as a result of this disturbance. This water will be pumped out into the downstream of the respective nalas mainly during monsoon season i.e. outside the mining property where the original course of these nalas will be maintained. Pre-mining elevation of topography varies from 497 m and 440 m above MSL. The HFL of Barki nadi as recorded in the vicinity of the project is 455.0 m above MSL (As on 17.09.1976) (adjacent surface RL along the HFL line is- 456m to 471m). So, there is no problem of surface water inrush into the mine. **Rainwater, which falls on the mining area and groundwater which seeps into the mine are also pumped out in the drainage system after treatment (through sedimentation) to maintain the e-flow (environmental flow).** Hence, there is no impact on drainage quantitatively.

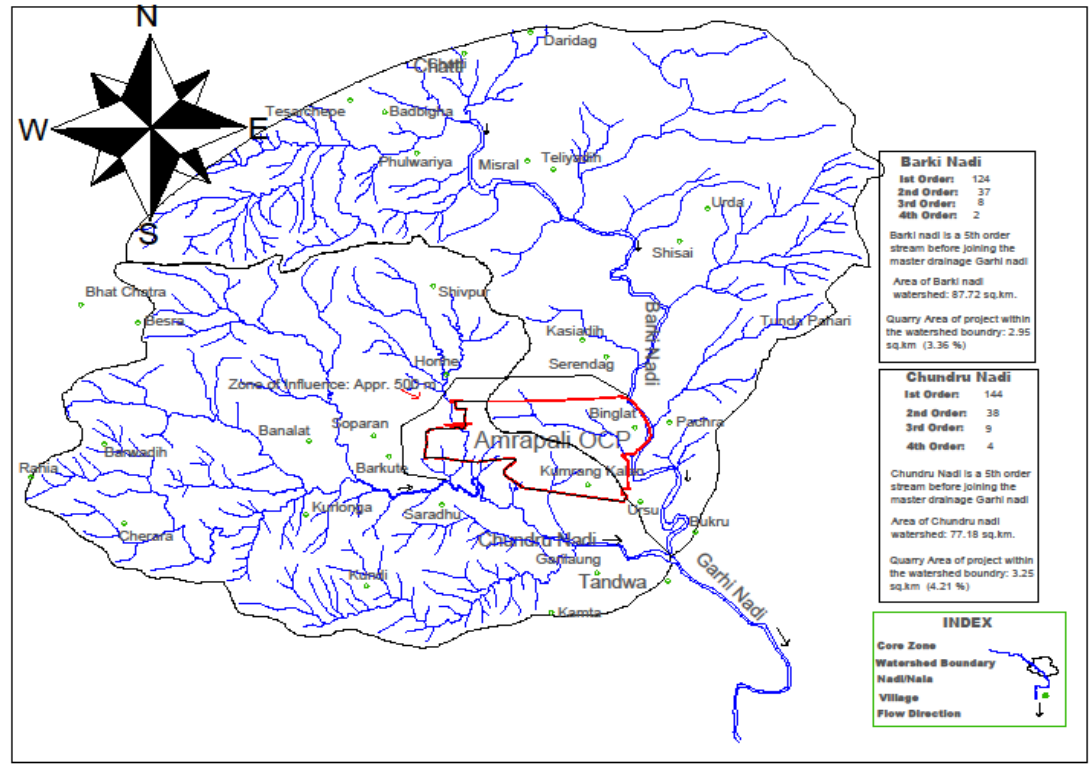


<u>Watershed Description of the Chundru and Barki nadi (within Buffer zone)</u>:

The project area lies in the catchment area of the Barki nadi in the east and Chundru nadi in the south which are the tributaries of the master drainage Garhi nadi flows towards south. The southerly flowing Barki nadi is a 5th order stream, meet Chundru nadi to form Garhi nadi at a distance of around 500m. The Barki nadi consists of 124 nos. of 1st order streams, 37 nos. of 2nd order streams, 8 no. of 3rd order streams and 2 no. of 4th order streams. The easterly flowing Chundru nadi is a 5th order stream, in south of the project to meet Garhi nadi. The Chundru nadi consists of 144 nos. of 1st order streams, 38 nos. of 2nd order streams, 3 no. of 3rd order streams and 4 no. of 4th order streams. The leasehold area of Amrapali Expansion OCP is 6.1987 sq.km (619.87 Ha) whereas the quarriable area is about 4.2522 sq.km (425.22 Ha). The leasehold area falls in the watershed of Chundru nadi (Watershed area: 77.18 sq km) is 3.25 sq km (4.21%) whereas, around 2.95 sq.km (3.36%) quarry area falls in the Barki nadi watershed (Watershed area: 87.72 sq km). Mining of this small portion will hardly have any impact on the topography and drainage of the area (quantitatively).

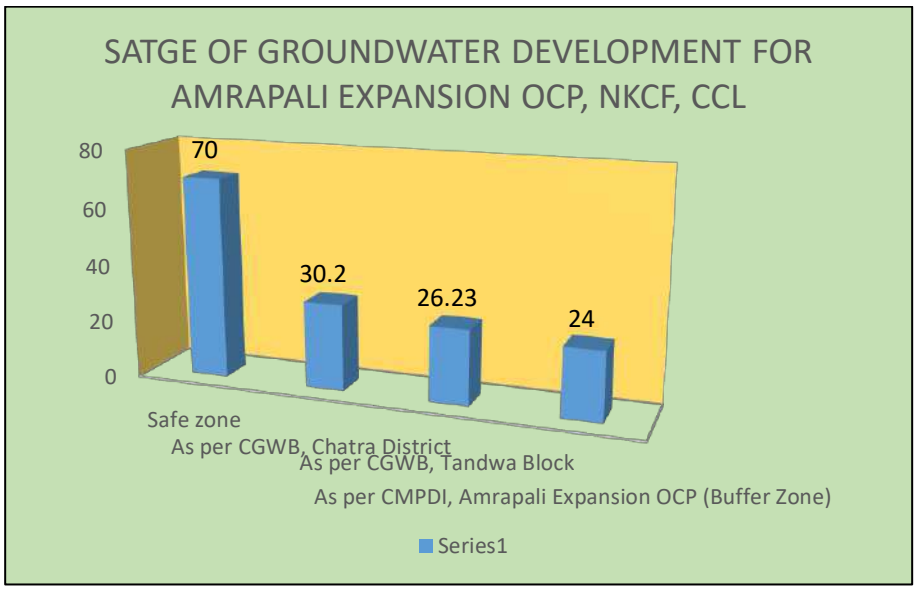
Details of Chundru and Barki nadi Catchment Area

Particulars	Chundru nadi	Barki nadi
1st Order	144	124
2nd Order	38	37
3rd Order	3	8
4th Order	4	2
Order of Stream	5th Order	5th Order
Parent Drainage	Garhi Nadi	
Area of Catchment (within Buffer Zone)	77.18 km^2	87.72 km^2
Quarry area falls in the Catchment Area	3.25 km^2 (4.21%)	2.95 km^2 (3.36%)



Stage of Groundwater Extraction: Coal mining is the major industrial activity in the area. CGWB, Mid-Eastern Region, Patna has reported the stage of ground water development in Tandwa development block (where Amrapali Expansion OCP exist), Chatra district as 26.23 % and identified the region with category **"Safe".** The ground water development in Chatra district was reported as 30.20 % and identified under the category of **"Safe"**. Stage of groundwater

development for buffer zone of the project area determined is about 24.0 %, which is also under 'safe' category.



Radius of Influence: Considering the dewatering of unconfined aquifer in the immediate mine area and permeability 2.0 m/d, by using the Sichardt formula [$R = C*(H - h_w)*\sqrt{k}$], the radius of influence for the **proposed** Amrapali Expansion **OCP** has been estimated. The pre-monsoon water level data of piezometer is 48.0 (as informed by Project Authority telephonically). The projected radius of influence due to Amrapali Expansion OCP on groundwater has been estimated and ranges between 450.0 mt to 500.0 m from the mine periphery. Some of the village falls in the leasehold of Amrapali Expansion OCP and they will affected, if not shifted. But outside the leasehold boundary there is no any village in this impact zone. Due to stratification, the permeable beds act as individual hydrogeological units and develop a multi-aquifer system. Hence, the radius of influence in these individual hydrogeological units will be small. Thus, with the variation of the aquifer/mine geometry, multi-aquifer system, return flow from the mine discharge and abundant recharge, the zone of disturbance will be reduced further. Thus, the propagation of drawdown cone will be limited to a small distance for a temporary period.

SCHEME

FOR

DIVERSION OF NALA

AT

AMPRAPALI OPENCAST PROJECT

(12.0 MTY)

OF

CENTRAL COALFIELDS LIMITED

DEC, 2014

SLOPE STABILITY CELL

ENVIRONMENT DIVISION

CENTRAL MINE PLANNING & DESIGN INSTITUTE LTD.

(A Subsidiary of Coal India Ltd.)

GONDWANA PLACE

RANCHI – 834031

CHAPTER- I

1.0 Introduction

1.1 Background

Amrapali opencast is a new project and it is located in the northern fringe of Northkaranpura Coalfields under the CCL command area.

Amrapali opencast mine has been planned from two contiguous blocks, Amrapali and Kishanpur to exploit coal up to a depth of around 135m to produce coal at the rate of 12.0mty.

There are several small and medium size channels crossing the area or passes just outside of the property, flow from North to South and finally join either Barki river or Chundru River that is of order IV nala.

Several small nala of order I exist within the mining property, except the Binglat Nala. This Binglat nala starts from Kurhapuo Protected Forest Hills which is just outside of western boundary of the project and crosses the property parallel to northern boundary in zig-zag path and merge in Barki nala at the middle of eastern boundary. This nala starts as first order nala and became third order nala within two km voyage. This nala needs to be diverted to continue the work as per planning.

So CCL has requested CMPDI for making the suitable scheme via their letter no. CGM(P&P)/2013/1343-46 dated 11.11.2013. Accordingly Slope Stability Cell of Environment Department has taken the job with job no. 94313133.

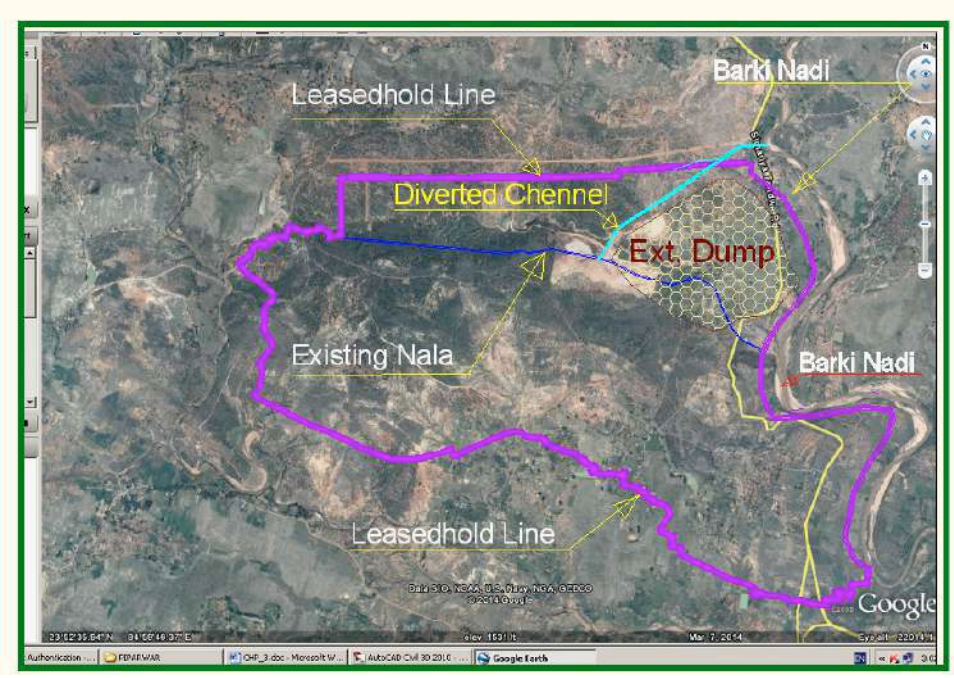
1.3 Scope of Work

Our scope of work of this report is to check the feasibility & justification of diversion of Binglat Nala. If viable, the suggestion of the diversion route, the diverted length, cross-section, profile and gradient of diverted nala bed on the basis of data provided by project authorities.

1.4 Objective

Amrapali Opencat project is new project and started this year. Binglat nala is crossing mining area in zig-zag path, parallel to almost northen boundary of the project and merge with the Barki River flowing north to south along the eastern boundary of the project.

For smooth running of the project, diversion of this nala is necessary for mining and to facilitate the external OB dumping at the north-east corner of the project.



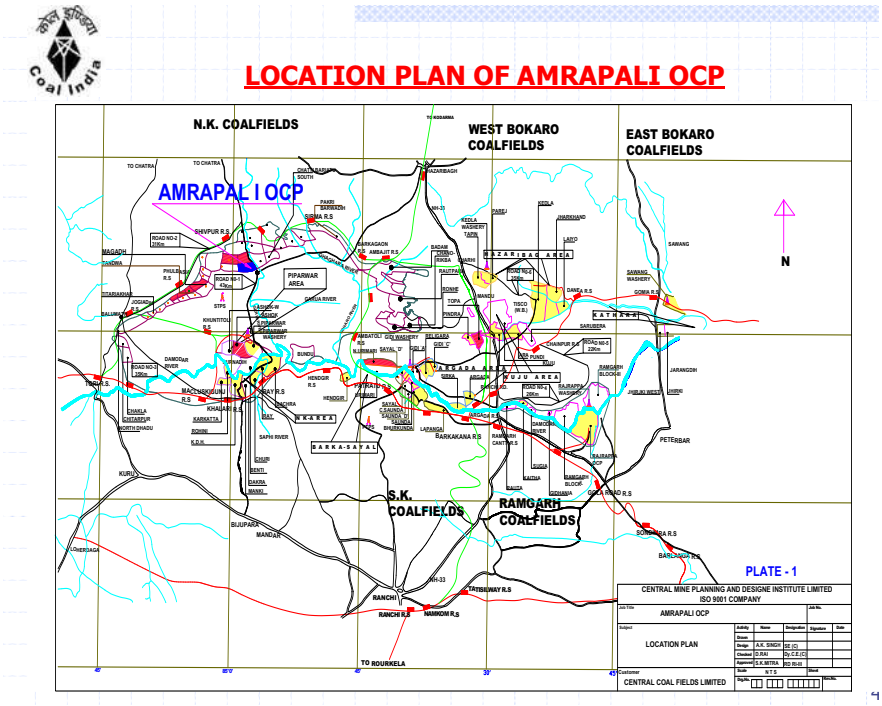
Above map shows the conceptual plan of the project

2.0 Project Briefing

2.0 General Information

2.1 Location

Amrapali OCP is situated in North karanpura Coalfilds under Rajhara Area of CCL in Chatra District of Jharkand State. It is located in north - west direction from Ranchi at distance of 75 Km. Due to anticipated demand of medium Coking coal grade, it is proposed to start Amrapali OCP to produce coal at the rate of 12.0 Mty. per annum and linked with Barh STPC.



2.1 Location:-

The Project falls in part of five villages and forest area. The villages are - Urshu, Binglat, Kumarang Kalan, Kumarang Khurd & Honne in Tandwa block of Hazaribagh district of Jharkhand State.

a) Latitudes - $23^0$51'31" N & $23^0$53'38" N

b) Longitudes - $85^0$00'05" E & $85^0$02'07" E

c) Topo sheet No.– 73E/1, 73A/13

d) Company **–** C.C.L

e) District – Chatra

f) State – Jharkhand.

2.1 Surface Communication: -

2.1.1 Road - The proposed project is approachable by a 12 KM long fair weather Kutcha road from Tandwa Village. Tandwa village is connected to Khalari by a 20 KM metallic road in the south. It is connected with Hazaribagh also by a 50 KM long metal road via Barkagaon.

2.1.2 Railways- Nearest railway stations is Khalari Railway Station, 25 km away. This railway station is situated on Gomoh – Barkakna loop line of Eastern Rly.

2.1.3 Airways- Nearest Air service is available from Ranchi that is about 90 Km. away from the project.

2.1.4 Distance of important place

a) G.M. Office, N.K. Area 22 KM

b) Ranchi - 85 km. (Takes 3.0 hr. by road)

c) Hazaribagh -- 65 km (2.5 hr. by road)

2.2 Topography : -

The Amrapali Block is characterized by gently undulating topography with depression and sand stone ridges. The general slop of the area is either towards South or towards the respective river/nala. Most of the small channels crossing the area, flow from North to South and finally join either Barki river or Chundru River. The maximum and minimum elevation of the block is +497 m and +440 m respectively.

2.3 Drainage

Main drainage of the block is controlled by the Barki River flowing along the eastern boundary of the project and Chundru nala, tributary of Barki River, flow along the western side of the boundary.

Excess surface run-off of the surrounding area is carried away by these River/Nalas and finally merges with Damodar river near Piparwar.

During summer season all the rivers, nalas and most of the wells become dry. Water table goes down up to 12.0m. In rainy season water table varies from 1.52 m to 3.04 m below GL.

2.4 Climate

Tropical climate is prevailing in this region with three main seasons namely winter, summer and rainy season, which pass through extreme conditions. Each season spreads over three months. April to June is summer season, July to September is rainy season having generally 73 rainy days and average rainfall is 1200 mm and December to February is winter season. Summer days are very dry, scorching heat and dusty day, temperature soar to about 47^0C while winter nights are very chilly cold and temperature goes down to as below as 3^0C and rainy season have heavy rain fall. Some times total rain fall is around 2000 mm annually and creates havoc in the regions.

Prominent wind direction in summer is from north to south,

2.5 Boundaries of Mine

Northern Boundary

Northern Boundary has been fixed along the incrop of seam-I (B)/(IB+IM+IT) Combined.

Eastern Boundary

The eastern surface boundary has been fixed leaving a surface barrier of 60m from Barki River.

Western Boundary

The **western surface boundary** has been fixed leaving a surface barrier of 60m from Chundru nala.

Southern Boundary

The Southern floor boundary has been fixed along the FRL of 340m (on seam I (B)/(IB+IM+IT)Combined floor), corresponding to a maximum depth of 135m.

2.6 Geology of Amrapali Block

Amrapali opencast mine has been planned from two contiguous blocks, Amrapali and Kishanpur to exploit coal up to a depth of around 135m keeping seam-I Bottom as base seam & I Middle +Bottom/I Top+ I Middle +I Bottoms where the I Bottom seam combines with upper seams to form the composite seam .The base seam I Bottom has been proved in Amrapali block up to a depth of 255 m and up to 225 m depth in Kishanpur block respectively .

2.6.1 GEOLOGICAL AND MINING CHARACTERISTICS

Table-2.6.1

Sl.	Particulars	Unit	Sections	
			Eastern	Western
A.	Thickness of Coal Seams			
1	I (B.)	m	4-8	6-10
2	I (M.)	m	5-7	6-7
3	I (T)	m	3-8	2-4
4	I (C)	m	14-20	-
5	II (B.)	m	1-2	1-2
6	II (T)	m	1-2	1-2
7	III (C)	m	6-10	6-10
8	IV	m	4-6	3-6
B	Thickness of OB & Parting			
1	Top OB	m	5-80	6-70
2	Part. bet.I (B) & I(M)	m	4-16	0-3
3	Part. bet.I (M) & I (T)	m	0-2	0-2
4	Part. bet.I (T) & II (B)	m	5-27	5-31
5	Part. bet. II (B) & II (T)	m	10-14	2-12
6	Part. bet. II (T) & III (Comb.)	m	6-10	6-8
7	Part. bet. III (Comb.) & IV	m	6-9	5-8
C	Quarry Parameters			
1	Dip of the seams	Degree	3-6	6-8

2	Strike length	Km	2.4	2.2
3	Width	Km	1.4	1.4
4	Area of Excavation	Ha.	493.7	337.25
5	Maximum depth	m	135	135

COAL RESERVES

A total of 689.81 mt of net quarriable reserve (486.50 mt from Amrapali Geological block and 203.31 mt from kishanpur Geological block) is available. But only 291 mt of mineable reserve is planned in **Amrapali OCP** up to a depth of 135 m. The balance reserve falling in the dip side of the quarry may be planned for exploitation in second phase subject to techno economical viability of mining.

Sl. No.	Seam	Mineable Reserves (M.tes.)		
		Sections		Total
		East	West	
1	I (B)/I(B+M)/I(B+M+T)	88.47	40.41	128.88
2	I (M)	3.46	6.75	10.21
3	I (T)/I(T+M)	23.11	23.26	46.37
4	II (B)	12.93	1.81	14.74
5	II(T)	9.05	2.25	11.30
6	III (C)	29.73	18.1	47.83
7	IV	22.28	9.49	31.77
8	**TOTAL**	**189.03**	**102.07**	**291.1**

OVERBURDEN

A total of 459.68 million Cum(265.95 from eastern &193.73 from western quarry) of overburden is estimated in the Project. Out of this, 41.10 M.Cum. is estimated to be placed as external dump ‘A’ and remaining would be placed as internal dump ‘B’ and ‘C’.

Sl.No.	Partings	East	West	Total
1	I(B) - I(M)	7.69	26.26	33.95
2	I (M) - I(T)	0.56	15.40	15.96
3	I (T) -II (B)	66.29	18.02	84.36
4	II (B) - II (T)	20.62	26.31	46.93
5	II(T)-III(C)	20.81	15.94	36.75
6	III-IV	15.12	15.52	30.64
7	Top OB	134.86	76.28	211.14
8	**Total**	**265.95**	**193.73**	**459.68**

STRIPPING RATIO

Based on the above figures the overall stripping ratio for the Coal reserves of 291.1 million tones against the total OBR 459.68 MM^3 is 1.58 Cm/ per tone of coal.

Sl.No.	Partings	East	West	Total
1	Stripping Ratio(m^3/te.)	1.41	1.90	1.58

DIP:- The dip of formation moves for 3^0-6^0 in eastern quarry and to 6^0-8^0 in western quarry.

COAL QUALITY

The product mix quality of the Amrapali OCP will be grade F (Avg. UHV 2659 K. Cal/Kg & Avg. CV 4038 K.Cal/Kg) with corresponding average ash of 40.61%. With the assumed dilution while mining 0.15m of non-combustible material at roof and floor, there will be addition of ash and the weighted average ash of the product mix will be 42.16%. Even with this dilution the Product Mix Quality is likely to be grade-F (UHV around 2447 K.Cal/Kg)

Mining Technology

OB Removal

Considering the mining and geological conditions, the mine is proposed to be worked by dragline and shovel-dumper combination of mining systems. The parting between I(T) & II(B) is proposed to be handled by the dragline 20m^3 90m.

The intervening partings will be mined and transported by 8.3 cu.m Hyd. Shovel alongwith RD-85T Dumpers. The Top OB will be mined and transported by 20 cu.m Rope Shovel alongwith RD-170T (EWD) Dumpers.

Coal Winning

Loading and transportation of coal using machines, blast hole drilling in coal and face preparation have been proposed to be outsourced and hence HEMM for coal winning have not been provided in this PR.

2.7 MICRO-METEOROLOGICAL STATUS

(i) Wind Speed/Direction during Summer Season

Generally, light to moderate winds prevail through out the season. Winds were light and moderate particularly during the morning hours. During the afternoon hours the winds were stronger. Wind speed readings are ranging from <1 km/hr. to 14.2 km/hr. The seasonal average wind speed is observed to be 5.4 km/hr. The wind patterns of the season are presented below:

The analysis of wind pattern during the season shows that the predominant wind direction is from North-West with wind frequency of 15.31%. It is followed by North - East with 6.7% frequency. The other observed directions are South-West (5.98%), North (4.44%), South-East (4.03%), North-North-East (3.48%), etc.

The calm conditions prevails 45.14%. The wind speeds of 1-5 km/hr and 5-11 km/hr were recorded for 51.38 % and 3.43 % of the total time respectively.

2.4.1 Existence of water bodies

Drainage of the area is controlled by the Barki nala in East, Chandru nala in the south and Binglat Nala in the east. Chandru nala meets Barki nala out side the south-east side of the project and after that it is called Garhi River. Binglat nala meets the Barki river near the north-east corner of the project. Binglat and Chandru nala are seasonal water courses. Small streams near the eastern and southern boundary of the project area present but it flow directly into Binglat and Chandru nala respectively. Some small water bodies are also available on depressed land area.

CHAPTER - III

Design Criteria

3.0 General

Design of a channel for diverted course of nala and construction, needs the knowledge of lots of parameters. Some important parameters are needed for design of this nala as mentioned below.

3.0.1. Existence of water bodies

Topographical and physical survey study suggests that the existence of several Nala of different order near the up-stream side of the project. All existing nala is order – I except Binglat Nala which is of orde III and barki nadi and Chundri river which is of order – IV. Barki river and Chundri merge at south-eastern corner of the project and then it is called as Garhi Nadi fo order V.

Some small water bodies are also available on depressed land area.

3.0.2 Selection of Alignment

This Binglat nala start from north west corner of Amrapali Project, flows in zig-zag path within the properties and merge with Barki river on eastern boundary of the project.

For selection of starting point of diversion, team started moving western boundary of the project by a vehicle along the Binglat nala. We crosses the workshop, administrative office, other infrastructure and present running dump side and finally reach the confluence point of Binglat and Barki nala.

After the discussion with project authority and planner, it was decided to start the diversion of the Binglat nala from western side of the proposed external OB dump (Ref. Point -109851,3102416) and finish point of diversion will be with merging with Bakri River (Ref. point -1099085,310886), almost half km away in up stream side from existing confluence point of Binglat nala and Barki River.

Following are the points considered for selection of alignment.

1). Alignment should be selected in such way that there is least disturbance original route

2). New alignment should not pose any danger to quarry in future

3). Interest of local habitant in down stream side does not get affected much.

4). Level of termination point must be lower than the starting point of diversion.

5). It will be ideal if cutting and filling for construction of channel is equal.

6). Topography of alignment should be favorable for construction of channel.

7). Land should be available for construction of channel.

3.1 HYDROMETEOROLOGY

The quantity of surface water runoff is closely linked with the hydro-meteorological conditions of the area. A major part of this surface runoff drains out into the local drainages which in turn discharge its load into the master drainage of that area. So rainfall is the deciding factor to guide the flow of water in River/nala.

Hence, hydrometerlogical study of the area is necessary to calculate the water flow in River/nala.

3.1.1 Rainfall Data and its Analysis

It is important to analyze the normal rainfall conditions and its variations in the study area during pre-mining conditions so that the fluctuations in surface run-off can be determined to calculate the maximum flow in nala.

3.1.2 Normal Rainfall in the Study Area:

The normal annual rainfall (1945 – 2010) in respect of the study area is available for analysis. The annual normal rainfall in the study area is 1342 mm. There is a marked variation in the annual rainfall from year to year. In the sixty-four year period from 1945 - 2010 (with two gaps: 1978 & 1993), the highest

annual rainfall occurred in the year 2001, when it amounted to 2543.8 mm i.e. 189 percent of the normal rainfall. In this period there were only 17 Years when the rainfall was less than 80% of the normal. It can be deducted from the study that the rainfall in the area was between 1001 and 1400 is 29 years, less than 1000 mm is 10 years and more than 1400 mm in 25 years, out of the entire 64 years. Data on heaviest rainfall in a single day of the area has been obtained from 1975 -2010. The heaviest rainfall recorded in the area in 24 hours was 239.7 mm on 17th July, 1975.

The probability percentage of amount of rainfall in the study area has been worked out by simple probability of rank method. The results are tabulated in Table 3.1.3. Mean annual rainfall in study area is arranged in descending order of magnitude and in computations for probability analysis. Chegodaye equation has been used.

3.1.3 Probability of Annual Rainfall in the Study Area

The probability percentage of amount of rainfall in the study area has been worked out by simple probability of Rank Method. The results are tabulated in Table

Mean annual rainfall in study area is arranged in descending order of magnitude and in computations for probability analysis, Chegodaye equation has been used.

Probability Percentage P = m – 0.3 / n + 0.4 x 100

Where

P = Probability

m = Rank of variant, and

n = No. of variant

Annual rainfall Distribution and percentage probability

Table.- 3.1.3

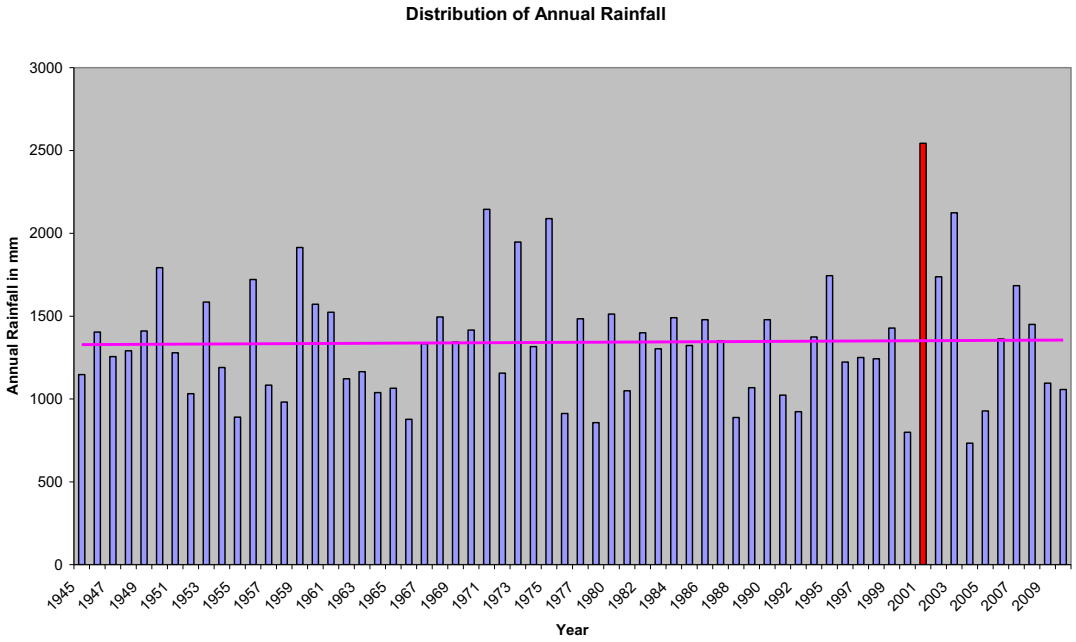
SL No	YEAR	ANNUAL RAINFALL IN mm	Rank of variant	PERCENTAGE PROBABILITY	MAX RAINFALL IN A DAY IN mm
1	2001*	2543.8	1	1.09	58.8
2	1971	2145.3	2	2.64	
3	2003*	2123.6	3	4.19	59.8
4	1975	2089	4	5.75	139.7
5	1973	1947.2	5	7.30	
6	1959	1914.9	6	8.85	
7	1950	1792.7	7	10.40	
8	1995	1744.1	8	11.96	158.75
9	2002*	1737.6	9	13.51	88.8
10	1956	1721.1	10	15.06	
11	2007	1683.9	11	16.61	71.88
12	1953	1585.5	12	18.17	
13	1960	1571.8	13	19.72	
14	1961	1523.3	14	21.27	
15	1980	1512.8	15	22.83	129.8
16	1968	1494.8	16	24.38	
17	1984	1491.1	17	25.93	99.31
18	1977	1483.6	18	27.48	115.82
19	1986*	1479	19	29.04	131.8
20	1990*	1478.4	20	30.59	93.8
21	2008	1450.42	21	32.14	60.2
22	1999*	1428.6	22	33.70	76.8
23	1970	1415.5	23	35.25	
24	1949	1410	24	36.80	
25	1946	1403.6	25	38.35	
26	1982	1400	26	39.91	62.23
27	1994	1374.43	27	41.46	82.8
28	2006	1362.17	28	43.01	93.98
29	1987*	1351.8	29	44.57	82.8
30	1969	1343.9	30	46.12	
31	1967	1334	31	47.67	
32	1985	1322.94	32	49.22	86.86
33	1974	1315.6	33	50.78	
34	1983	1302.5	34	52.33	78.74
35	1948	1291.1	35	53.88	
36	1951	1278.4	36	55.43	
37	1947	1256.3	37	56.99	
38	1997*	1250.2	38	58.54	116.6
39	1998	1242.62	39	60.09	78.23
40	1996*	1223.2	40	61.65	80.6

41	1954	1190.2	41	63.20	
42	1963	1165.1	42	64.75	
43	1972	1155.5	43	66.30	
44	1945	1147.6	44	67.86	
45	1962	1121.7	45	69.41	
46	2009	1095.09	46	70.96	116.58
47	1957	1083	47	72.52	
48	1989*	1068.2	48	74.07	75.8
49	1965	1065.2	49	75.62	
50	2010	1057.3	50	77.17	57.91
51	1981	1049	51	78.73	69.34
52	1964	1038.1	52	80.28	
53	1952	1032	53	81.83	
54	1991	1022.6	54	83.39	79.5
55	1958	981.2	55	84.94	
56	2005	927.01	56	86.49	62.23
57	1992	922.71	57	88.04	69.34
58	1976	912.1	58	89.60	
59	1955	890	59	91.15	
60	1988*	888.5	60	92.70	104.8
61	1966	877.2	61	94.25	
62	1979	857.2	62	95.81	61.5
63	2000*	798.6	63	97.36	58.6
64	2004*	732.8	64	98.91	52.8
	AVG	1342.17			

* IMD Data

With the above analysis it is observed that the average annual rainfall for the entire period of 64 years is 1342 mm in which annual maximum rainfall was 2544 (2001) and minimum was 733 mm (2004). Probability analysis reveals that the chance of occurrence of minimum rainfall 733 mm is 99 %. Similarly the chance for occurrence of 1323 mm rainfall is 50 % and that of the maximum rainfall of 2544 mm is just a shade above 1 %.

3.1.4 Annual Rainfall in mm v/s Year

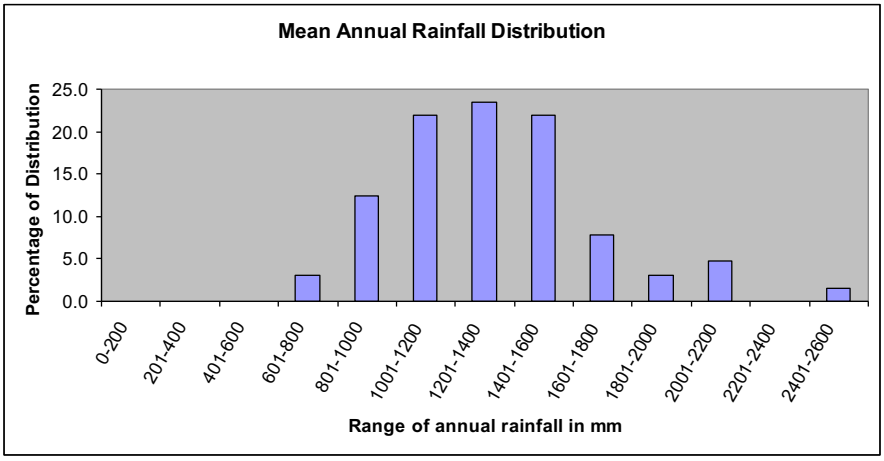


Mean Annual Rainfall Distribution

Sl. No.	Range of Mean Annual Rainfall in mm		Number of years	Percentage of Distribution
	From	To		
1	0	200	Nil	0.0
2	201	400	Nil	0.0
3	401	600	Nil	0.0
4	601	800	2	3.1
5	801	1000	8	12.5
6	1001	1200	14	21.9
7	1201	1400	15	23.4
8	1401	1600	14	21.9
9	1601	1800	5	7.8
10	1801	2000	2	3.1
11	2001	2200	3	4.7
12	2201	2400	Nil	0.0
13	2401	2600	1	1.6

In maximum number of years, i.e. 29 years (Sl. No. 6 & 7 of Table 2) it is observed, that the rainfall ranges between 1000 and 1400 mm in the study area. The occurrence percentage of amount of rainfall in the study area has been worked out on the basis of 64 years of data.

3.1.5 Percentage of Distribution v/s Range of annual rainfall.



3.1.6 Distribution of max. Rainfall in a day and percentage probability.

Year	Annual Rainfall in mm	Max rainfall in a day (mm)	Date of max rainfall
1975	2089	158.75	17-Jul
1977	1483.6	115.82	24-Jun
1978	NA	85.34	04-Oct
1979	857.2	61.5	16-Jul
1980	1512.8	129.8	26-Aug
1981	1049	69.34	16-Jul
1982	1400	62.23	09-Aug
1983	1302.5	78.74	06-Aug
1984	1491.1	99.31	23-Jun
1985	1322.94	86.86	16-Oct
1986*	1479	131.8	
1987*	1351.8	82.8	
1988*	888.5	104.8	
1989*	1068.2	75.8	
1990*	1478.4	93.8	
1991	1022.6	79.5	22-Jul
1992	922.71	69.34	26-Sep
1994	1374.43	82.8	28-Jun
1995	1744.1	158.75	27-Sep
1996*	1223.2	80.6	24-Jun
1997*	1250.2	116.6	13-Sep
1998	1242.62	78.23	05-Sep
1999*	1428.6	76.8	21-Jul
2000*	798.6	58.6	22-Sep
2001*	2543.8	58.8	09-Jun
2002*	1737.6	88.8	03-Jul

2003*	2123.6	59.8	25-Jul
2004*	732.8	52.8	13-Jul
2005	927.01	62.23	21-Aug
2006	1362.17	93.98	07-Jul
2007	1683.9	71.88	10-Sep
2008	1450.42	60.2	14-Aug
2009	1095.09	116.58	06-Sep
2010	1057.3	57.91	20-Aug
AVG.		89.47	

* IMD Data

With the above analysis it is observed that the average peak rainfall in a day for the entire period of 34 years is 89.47 mm in which maximum rainfall in a day was 158.75 mm (1975) and minimum was 52.8 mm (2004). Probability analysis reveals that the chance of occurrence of minimum peak rainfall 52.8 mm is 98 %. Similarly the chance for occurrence of maximum peak rainfall of 159.47 mm is about 2 %.

3.1.7 Mean monthly rainfall

The mean monthly rainfall in the area, calculated on the basis of rainfall data available for the area for (1945 – 2010 with a few gaps) is given hereunder. It is evident from the data that the area received maximum rainfall during the month of July followed by August, September on number 2 & 3 respectively in decreasing order.

Table- 3.1.7

Mean Monthly Rainfall in mm

Month	Rainfall (mm)
Jan	12.8
Feb	19.1
Mar	19.3
Apr	21.0
May	47.6
Jun	208.7
Jul	341.9
Aug	287.1
Sep	212.3
Oct	47.5
Nov	10.7
Dec	9.9

The rainfall contribution in monsoon is about 84.8% of the normal annual rainfall and it is 1017.6 mm. The rainfall contribution in non-monsoon is about 15.2% of the normal annual rainfall and it is 182.4 mm.

3.2 Hydrology.

Hydrology is very important parameters for construction of any type of hydro works. The Amrapali Block is characterized by gently undulating topography with depression and sand stone ridges. The general slop of the area is either towards South or towards the respective river/nala. Most of the small channels crossing the area, flow from North to South and finally join either Barki river or Chundru River. The maximum and minimum elevation of the block is +497 m and +440 m respectively.

Main drainage of the block is controlled by the Barki River flowing north to south along the eastern boundary of the project and Chundru nala, tributary of Barki River; flow west to east along the western and southern side of the project boundary. Earlier stretch of Garhi Nadi is knows as Daini nadi and Domuha Nadi.

Excess surface run-off of the surrounding area is carried away by these River/Nalas and finally merges with Damodar River near Piparwar.

During summer season all the rivers, nalas and most of the wells become dry. Water table goes down up to 12.0m.

The slopes of Jhirmakotma Protected Forest Hills in the northwestern part of the area represent the highest landmark (i.e. 641m AMSL).Barki Nadi start from this Jhirmakotma Protected Forest Hills, flows through the foot hill, crosses along the eastern block of boundary, and drains directly into Damodar River.

Another hill is Kurhapuo Protected Forest Hills which is just North to the Block. Southern part of the this hill has maximum elevation 520m AMSL, from where Garhi Nadi start in the name of Daini Nadi and Dumuhah Nadi and passes from

southern boundry of Amrapali Block to merge with the Barki Nadi at south-eastern corner of the Block.

Northern part of Kurhapuo Protected Forest Hills has maximum elevation is 500m from where intended nala, Binglat nala starts flow on the foot hill crosses the inside of the Amrapali mining area along the northern side of the boundary.

Following Hydrological data is important for smooth flow of water in channel without any menace.

1). Peak flow
2). Gradient of Channel
3). Flow Velocity
4). Channel Shape
5). Channel Size

3.3 Morphology/Geomorphology

The terms river/Nala morphology and its synonym fluvial geomorphology are used to describe the shapes of river/Nala channels and how they change over time. The morphology of a river channel is a function of a number of processes and environmental conditions, including the composition and erodibility of the bed and banks (e.g., sand, clay, bedrock); vegetation and the rate of plant growth; the availability of sediment; the size and composition of the sediment moving through the channel; the rate of sediment transport through the channel and the rate of deposition on the floodplain, banks, bars, and bed; and regional aggradations or degradation due to subsidence or uplift.

Following parameters of River/Nala, morphology is important for the nala diversion purpose.

1). Stream Order & Stream Lengths
2). Drainage Density
3). Stream Frequency

4). Watershed of River/Nala

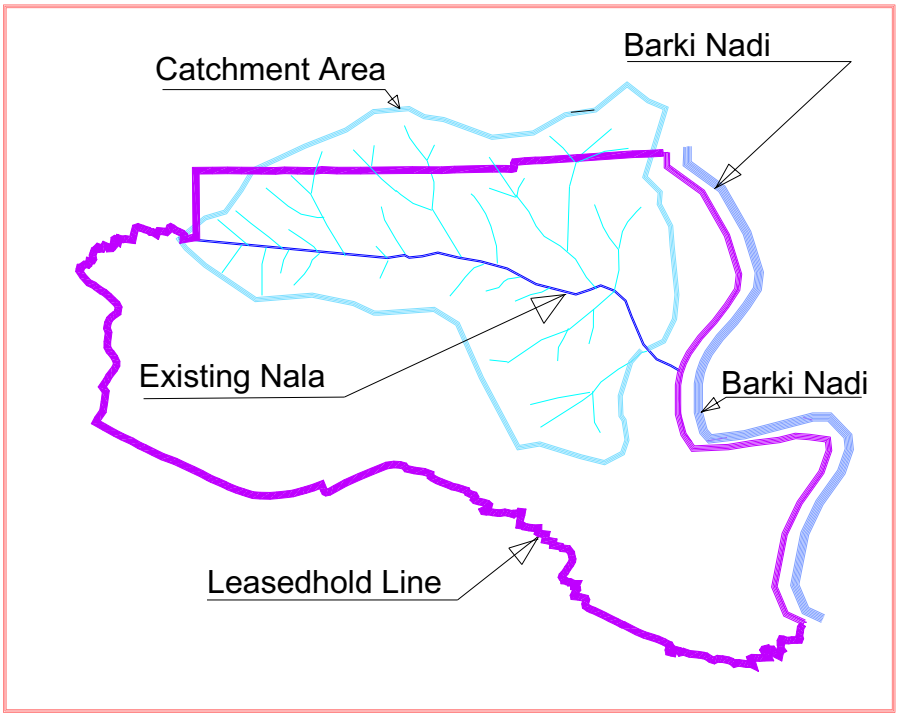
5.) Mean Length of the channel

6). Bifurcation Ratio

3.3.1 Stream Order & Stream Lengths

The first step in drainage basin analysis is designation of stream order following a system introduced by Horton and slightly modified by Strahler. This method has been followed in the present study.

The drainage basin map of Amrapali Project was prepared on topographic map of scale 1:50000. On the map the smallest fingertip, tributaries are designated of order 1. Where two first order channels join, a channel segment of order 2 is formed, where two of order 2 join, a segment of order 3 is formed and so forth. The trunk stream through which all discharge of water and sediment passes is, therefore, the stream segment of highest order.



Catchment Area

The number of streams order and stream length counted and measured for basins of command area of study is given below:

Table- 3.3.1

Sl. No.	Stream Order	Watershed of Nala A	
		Number	Length (Km)
1	I	27	9.5
2	II	8	4.0
3	III	1	4.5
4	IV	0	0.0
5	V	0	0.0
Total		**36**	**18.00**

3.3.2 Drainage Density

Drainage density is the expression of the closeness of spacing of channels of basin. It indicates the mean length of the stream in a basin per unit area and is obtained by dividing the total length of channel segment by the total basin area. The values range from 1 to 62 Km per Sq Km (Horton).

The drainage density for Binglat Nala sub-basin is 2.4 Km per Sq Km. Low drainage density is obtained in the regions indicate the highly resistant or highly permeable subsoil under dense vegetative cover and where relief is low. This parameter further indicates that the surface erosion during the rainfall shall be less and hence the silt deposition into the drains and at their culmination points shall be under the condition of profile of equilibrium.

3.3.3 Stream Frequency

Stream frequency or channel frequency (F) is the number of stream segments per unit area, and it is obtained by dividing the total number of stream segments of all order by the total basin area.

The stream frequency of Nala A sub-basin is 2.0 per Sq.

3.3.4 Watershed of Binglat Nala Sub Basin

Watershed of Binglat Nala has been formed by the rivulets of a seasonal of forest and second order stream emerging from Westerly situated Kurhapuo Protected Forest Hill. This Binglat nala originates from the Kurhapuo hills situated just outside the western boundary at an elevation of about 500 m above mean sea level (AMSL). Within an aerial distance of 2.0 Kms. from the place of its origin the small rivulets converge to form the third order stream in a relatively plain terrain. The general width of the river ranges from 1.0 m to 7.0 m from its origin to the point of culmination and the depth varies from 0.1 m to several meters depending on the local topography.

Linear Parameters of sub-basins of Binglat Nala of Amrapali Area, CCL

Table- 3.3.4

Sl. No.	Parameters	Watershed of Nala A
1	Area of basin (KM^2) 'Au'	12.43
2	Perimeter of Basin (KM) 'P'	19.0
3	Basin Length (KM) 'L'	4.1
4	Diameter of circle with basin area (KM) 'D'	3.8
5	Area of the circle having the same perimeter of the basin (KM^2) 'AC'	28.72
6	Form Factor Rf = Au / L^2	0.73
7	Circularity Ratio Rc = Au / Ac	0.43
8	Elongation Ratio Re = D / L	0.92

The form factor for Nala A sub-basin is 0.73. The form factor values suggest that the basins are normal drainage basins and are said to have outline of long oval shaped. According to Horton, sheet erosion process acting on initially inclined surface forms these.

Miller expressed the shape of the basin as dimensionless circulatory ratio. The circulatory ratio for Binglat sub-basin is 0.43. According to Miller, the

basins situated on the flanks of moderately dipping strata, should have circulatory ratio values between 0.4 and 0.6. The geological strata, as already known, in these sub-basins, are low dipping.

Schumm used an elongation ratio to express the shape of basin. The elongation ratio for Binglat Nala sub-basin is 0.92. According to Schumm, lower the elongation ratio value of R_e approaches 1.0 as the shape of a drainage basin approaches to a circle. The ratio varies from 0.6 to 1.0 over a wide variety of climatic and geologic regimes. Typical values are close to 1.0 for regions of very low relief and are between 0.6 and 0.8 for regions of strong relief and steep ground slope.

Thus, basins having above mentioned values of circulatory and elongation ratios, are referred as long oval basins. The concentration time of surface runoff in such basins, is low over time and hence, all the surface flow of the basin will come to concentration point at small time. This increases the intensity of peak runoff and occurrence of flash flood, which cause heavy surface erosion leading to heavy sedimentation into the channel.

3.3.5 Linear aspects of the sub-basins in the WBCF Project area

Number of streams on order and their total lengths in WBCF basin

Table- 3.3.5

Sub-basin	Binglat basin		
Order ‘u’	Number of Segments 'Nu'	Length in Kms 'Lu'	Mean length of channel 'L~u'
I	27	9.5	0.35
II	8	4.0	0.5
III	1	4.5	4.5
IV	0	0.0	0.0
V	0	0.0	0.0
Total	**36**	**18.00**	

It is also evident from drainage map that most of the first order streams originate in the crescent shaped area of mining blocks forming the

groundwater divide for easterly and westerly flowing drains. This is the characteristic of typical recharge area where the fluctuation of water levels is very high and do not retain the similar yield throughout the year.

3.3.6 Mean Length of the channel

Mean length of the channel L˜u of a stream channel segment of order u is a dimensional property, revealing the characteristic size of components of a drainage network and its contributing basin surfaces. Channel length is measured through map measurer (Line meter) and, therefore, it almost represents the true length. To obtain the mean length of the channel 'L˜u' of order 'u', the total length is divided by the number of segments, Nu of that order. Thus, the mean segment lengths L˜u have been computed and tabulated above in table no 3.3.5.

The stream numbers and length typifying the basin govern the channel storage capacity that naturally is connected with hydrologic development. Hydrologic and physiographic development of a drainage basin affects the overland flow. A higher value of mean length of the indicates about the elongated basin and overland flow of smaller order streams suddenly localizes in the 3rd order streams, thus allowing less infiltration of rainwater into the ground.

3.3.7 Bifurcation Ratio

The bifurcation ratio (R_b) of the basin was calculated by plotting the logarithm of number of stream segments on ordinate against stream order on abscissa. The fitted regression shows a linear relationship with very small deviations from the straight line.

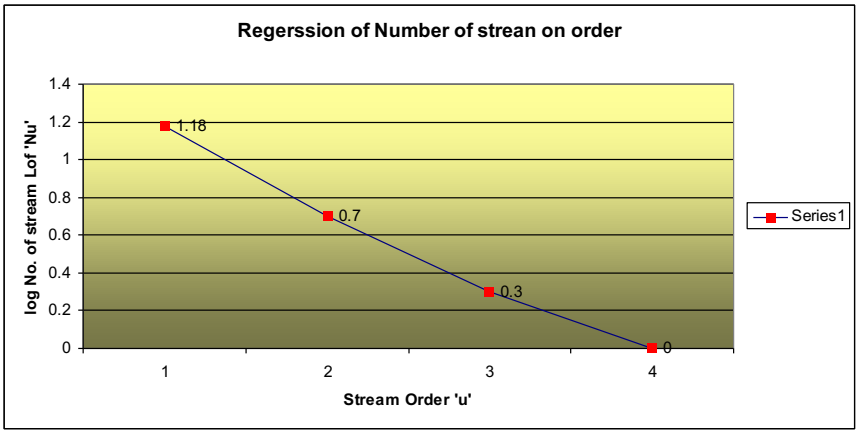


Fig. – 3.3.7

The regression coefficient (b) for the basin was determined from the slope of the regression line. The value is in the order of 0.4 for basin area.

Now:

Bifurcation Ratio (R_b) = log b^{-1}

That means antilog of the regression coefficient (b) is the bifurcation ratio of the basin. Thus the bifurcation ratio obtained for basin is 2.51.

Lower Rb values are the characteristics of structurally less disturbed watersheds without any distortion in drainage pattern. The bifurcation ratio obtained for the area under study falls within this range. Hence, this is interpreted that the geologic structures have not distorted the drainage pattern of the basin.

3.3.8 Inference of the Above Study

From the above study, following inference can be drawn about the type of catchments area, rainfall pattern, characteristics of terrain, order of streams, types of flood etc which will be deciding factors for designing the diversion channels.

1). Probability of rain fall above 1200 mm is 50 %, as per the study of rain fall pattern between 1969 to 2010.

The rainfall contribution in monsoon is about 84.8% of normal annual rainfall and it is 1017.6 mm. The rainfall contribution in non-monsoon is about 15.2% of the normal annual rainfall and it is 182.4 mm

2) It is calculated that 13.3% of the rainfall will go as potential annual infiltration, 10% of rainfall used by communities, 5% losses as a result of transpiration and evaporation.

3) In the vicinity, only one water shed area exists that is Binglat Nala water shed area. The water shed area has 75% streams of order- I. It means surface run-off would not accumulate at a point suddenly.

4) The drainage density for Nala is 1.4 Km /sq Km area. Low drainage density suggests that region has highly permeable subsoil under dense vegetative cover and where relief is low.

This parameter further indicates that the surface erosion during the rainfall shall be less, and hence the silt deposition into the drains and at their culmination points shall be minimum.

5) The form factor for Binglat Nala basin is 0.73. The form factor values suggest that the basins are normal drainage basins and have long oval shaped outline. This means concentration time of surface runoff, is low over time and hence, all the surface flow of the basin would concentration point in little time.

6) The elongation ratio for Binglat Nala basin is 0.92. According to Schumm, the values (lower value) in the range of 0.6 and above are generally associated with strong relief and steep ground slopes.

This increase the intensity of peak runoff and occurrence of flash flood with high speed that can causes heavy surface erosion leading to heavy sedimentation into the channel.

7) Lower Bifurcation ratios Rb values are the characteristics of structurally less disturbed watersheds without any major distortion in drainage pattern. The bifurcation ratio obtained for the area under study falls within this range. Hence, this is interpreted that the geologic structures have not distorted the drainage pattern of the basin.

3.4 In-Channel works

After calculating all necessary channel dimension of diverted nala along the selected alignment, now it is time to start civil construction works. Generally following type of works are involve in civil construction.

1). Method of construction

2).Channel stability

3). Bank Protection

4).Safety against accident

5).Environment

6).General Aesthetic/landscape

3.5 Source of Data-

Data required for the proposed diversion has been taken from following sources:

1) Present site Plan – By project authority, drg no.
2) Existing profile – Cross-section (longitudinal and transverse) of alignment of proposed diversion by project authority.
3) Hydrological report and related data. – By Exploration dept. of RI- III, CMPDI.
4) Mining related data.- By Opencast Dept of CMPDI.
5) HFL and HFL Plan - By Project authority
6) Rainfall data - By RI-III, CMPDI, Project authority and IMD Hazaribagh and other sourses.

CHAPTER – IV

Design & Analysis

4.0 Reconnaissance of Area

Design of any civil structure needs Reconnaissance of sites to get the first hand information regarding the topography, soil conditions, constraints if any, accessibility, availability of materials, safety etc. Amrapali Open Cast Project was visited by a team of experts from Slope Stability Cell, CMPDI (Hq), and the personals of project authority for examining the possibility of diversion of nala from suitable alignment to facilitate the mining works. Following plan shows the catchments area of the nala to be diverted and ideas of the topography of the area.

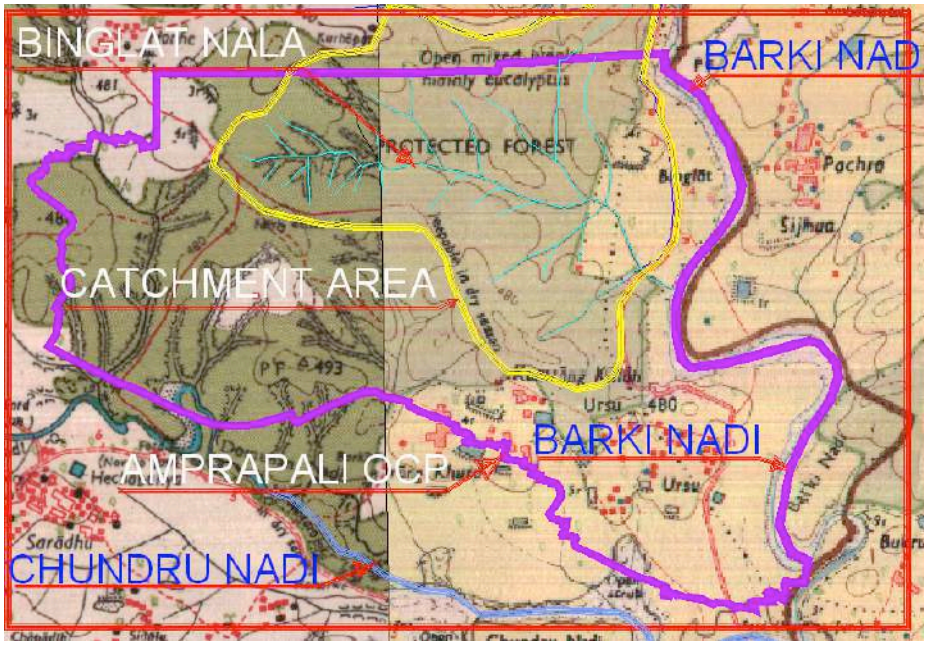


Fig.- 4.0

4.0.1. Parameters of Catchments area of the nalas up to the point of diversion

Following table shows the various parameters of the catchments area only.

Table- 4.0.1

Sl no	Features of nala	Nala'A'
1	Total catchments area* **A= Km^2**	5.4
2	Net catchments area=85% of Total area **Km^2**	4.6
3	Distance of farthest point of catchments from the point of diversion. **L= in Km**	2.3
4	Max. level difference **H = in M**	40
5	Max. rainfall ever recorded **in 24 hr.= in mm**	159
6	Run-off coefficient in **C in %**	65
7	Slope i = **H/L**	0.0174
8	Time of concentration **$T_c = (0.885\ L^3/H)^{0.385}$ x 60 Minute**	36.2
9	Average max. rain fall intensity during the concentration time **Rt_c = mm**	23
10	Max. discharge at (total catchments area) **Q = Cum/s**	57.0
11	Max. discharge at (Net catchments area) **Q = Cum/s**	49.7

• Catchments area up to the point of diversion.

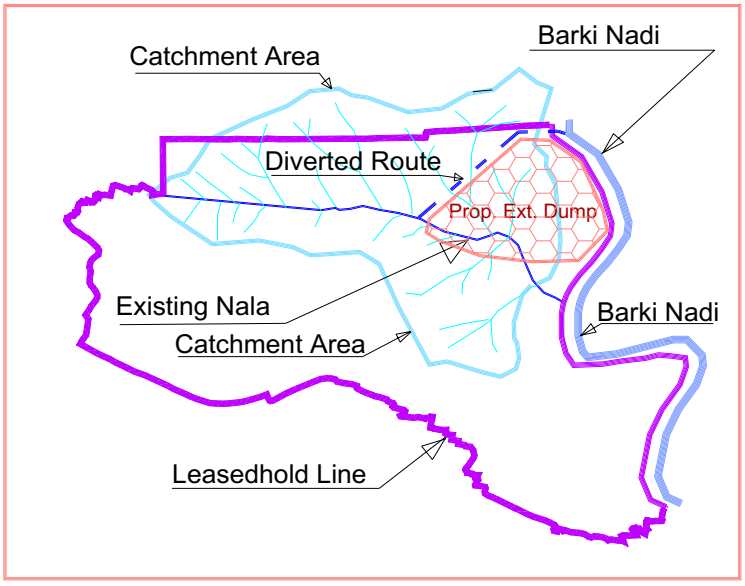


Fig.- 4.0.1

4.0.2 Surface Flow Total surface run off arise at point due to storm is equal to Catchments area (A) X Rainfall X Run-off coefficient (C).

Time taken for clearing off this run-off depends upon the various factors i.s topography, type of terrain, shape of the basin, rainfall pattern, etc.

4.0.3 Concentration time- Concentration time of surface run-off of any river/nala at the culmination point is the time, when all segments of the catchments area start to contribute to surface run-off. It is calculated from the drainage analysis method and tabulated in the above table.

4.0.4 Peak Flow - Maximum Peak flow occurs only when duration of a single storm (rainfall) is equal or exceeded the concentration time (T_c). But in the large catchment area a single storm, generally, does not cover the entire area. So, maximum peak flow does not arise and only peak flow occurs.

In the small catchments area, duration of a single storm generally equalizes or exceeds the run-off concentration time period of the basin. In this condition, maximum peak flow is directly proportional to the total rainfall in unit time in whole basin area.

Heaviest rainfall recorded in the district in 24 hr was 159 mm.

As per the maximum probable hourly rainfall chart for maximum rainfall in 24 hour for the arid, hilly and topographical area, probable maximum rain fall in concentration period for nala is tabulated in the above table.

In view of the soil characteristics, terrain situation and other atmospheric condition, 35% of water loss is envisaged which includes infiltration, transpiration, community uses and others.

4.0.5 Alignment of channel- After study of the topographical & contour map, mining & geological condition and other technical, mining and social parameters, it is decided to divert the Binglat nala from the north of the proposed OB dump as shown in the plan below.

Following Google Map shows the route of diversion of nala.

Fig.- 4.0.5

4.0.6 Sloping of channel Bed- Starting point of diversion would begin from the point 1098515 (N), 3102416 (E) at RL 460.50 (Present bed level) and it will terminate at the point 1099085(N), 3103886 (E) at RL 457.5.(Proposed bed level) Total length of diverted channel is about 1500 m. A hillock of maximum RL 478m (appox.) is encountered in diverted route. Entire route required cutting for formation of channel except some distance before the merger with Garhi nala. Maximum cutting would be around 18 m.

4.0.7 Cross-section of the Channel

This nala remains dry during non-monsoon period. Even in the monsoon period, most of the time, depth of water flow remains less than a meter, few days' depth of water goes more than a meter and during the peak flow and it occasionally goes to more than two meter. Ideally cross-section of nala should

be chosen in such an away that flow of water in the channel should maintain at non- scouring and non- silting velocity. So as there is no scouring or silting take place in channel, reduce level of starting point of diverted nala at 462.0m while the terminating point RL will be at 459.0m. Total length of nala is around 1500m.

4.0.7 Non-silting velocity

Non-silting velocity in this terrain is given by –

$V_0 = C_1 \ MY^{C2}$

$C_{1\ \&}\ C_2$ is a coefficient, Y= depth of channel (consider for 1_{st} tier only)

In this terrain $C_1 =$ 0.55, $C_2 = 0.64$, M = 1.3

$V_0 = 0.55x1.3x1.0^{.64} = 0.78$ M/sec, say 0.8 meter per second

4.0.8. Non- scouring velocity

Non-scouring velocity for this type of terrain has been suggested as 3.0 m/sec.

4.0.9. Highest Flood Level

No authentic highest flood level of Binglat Nala has been recorded of the project. After, looking the water marks in nala walls and enquiry with villagers, it is corroborate that highest flood level is around 1.25 to 1.5 meter above the average existing bed level of nala.

4.1. Design of cross-section of profile

First of all speed of water in channel should be maintained in such a way that there is no scouring or silting in channel. So, none scouring and non- silting velocity (1.0m to 3.0m per second) should be mentioned. So take the average speed 2.0 m/s in the channel. Due to steep gradient, at some places, velocity of water would cross the scouring speed and accordingly, cross-section would be changed to stabilise the speed but it may be not possible at all places and all the time.

Maximum discharge has been calculated 49.7 Cum/s for the nala and velocity of water in the channel is assumed 2.5m/sec. Therefore, wetted area should be around 22 sqm.

Size of cross-section is chosen in the line of existing nala (where depth of water is around 2.0 meter during high flood). So take the minimum bed width of channel around 5.0 meter.

Most of in flow water starts to comes in the nala is near the starting point of nala diversion. So cross-section of nala at the iniial stage would be less. It can be substantiated from the study of the existing cross-section of nala.

Since, flow of water in the channel, most of time, remain low, so it is decided to make the cross-section of diversion channel in two steps to maintain the non-scouring and non-silting velocity of water in the channel. In this type of terrain flash flood occurs frequently, so side slope of the diverted channel must be stable. Since, diversion is being through the middle of hard rock so side slope in 1:1 (1.0 horizontal and 1.0 vertical) ratio is sufficient for the side slope to stand against the drag force. At the portion, where filling is required for construction of channel, slope of channel side should be in 1.5:1 ratio.

A typical cross-section has been shown in the following drawing. However, shape of cross-section would change with the change of topography

Typical cross-section of channel

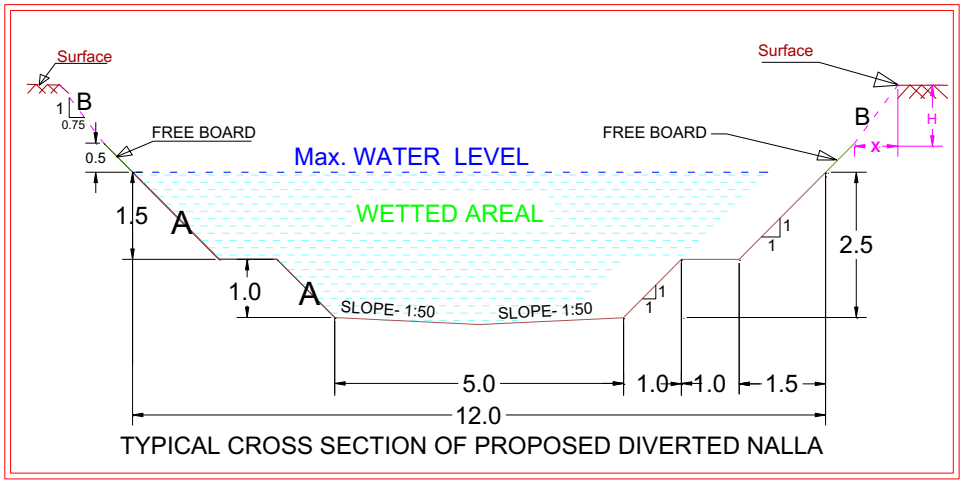


Fig.- 4.1

4.1.1. Validation of Cross-Section of Channel

Now, final cross-section, slope, etc have been finalized and actual velocity and discharge should be checked as follows:

Base widh of the channel = 5.0m

Depth of the water = 2.5m

Berm = 1.0m

Side slope = 1:1

Width of top level = 12m

Area of the channel = 21.75sqm

Wetted peremeter = 14.6m

Over all Slope = 0.004

Mean Haydrolic depth = 21.75/14.6 = 1.5

As per Chezy,s theory = $V = C (RS)^{0.5}$

Value of **C** is calculated from Kutters formula that comes to 45.3

Accordingly, V = 3.61m/sec

This calculated Velocity is high so reduce the slope 2 in 1000.

Now velocity comes to – 2.56m/s

Here, calculated velocity comes to 2.56 m/sec. which satisfied the non-silting and non- scouring velocity. So our assumed cross-section is validated.

4.2 Check Dam

Old course of nala will be filled with external OB dump. A protecting liner is required to protect the direct impact of water on the body of OB dump. Liner of boulder pitching will be done on the crossing point of original course of nala and new course of nala of Binglat nala and the OB dump.

Liner will be started from the OB dump in original course of nala and will extend along the side of new course of Binglat nala. Top level of liner should be at least 464m.

4.3 General Profile of channel at Different Chainage

Following drawing shows the general profile of channel at different section of along the diverted course of alignment.

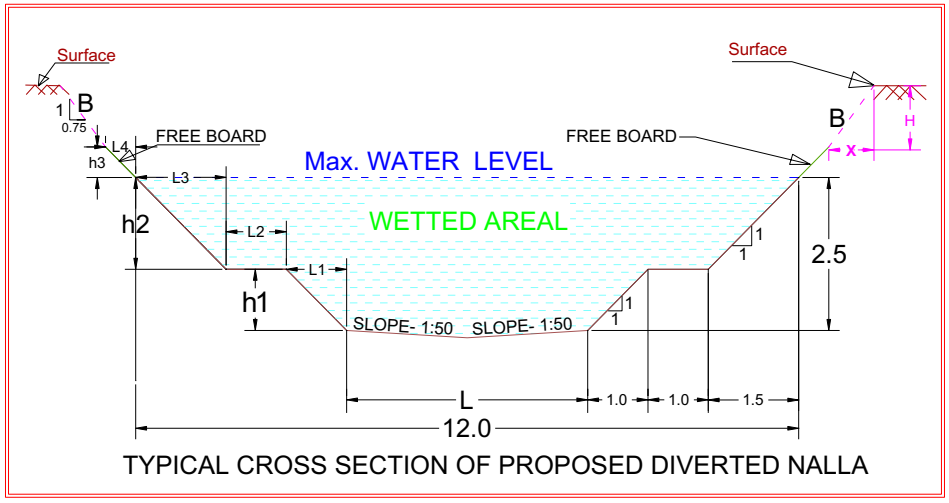


Fig.- 4.3

Following table gives the dimension of different component of cross-section profile at different chainage.

Bed width of nala L – 5.0 m

Width of inclined L_1 – 1.0 m

Berm of Nala L_2 – 1.0 m

Width of inclined L_3 – 1.5 m

Height of inclined h_1 – 1.0 m

Height of inclined h_2 – 1.5 m

Width of maximum water level - 12.0m

Table – 4.3

Sl. No.	Chainage	Bed level	Bed width		Sl. No.	Chainage	Bed level	Bed width
	in m	In m	H in m			in m	In m	H in m
1	0	460.50	5.0		27	780	458.94	5.0
2	30	460.44	5.0		28	810	458.88	5.0
3	60	460.38	5.0		29	840	458.82	5.0
4	90	460.32	5.0		30	870	458.76	5.0

5	120	460.26	5.0		31	900	458.70	5.0
6	150	460.20	5.0		32	930	458.64	5.0
7	180	460.14	5.0		33	960	458.58	5.0
8	210	460.08	5.0		34	990	458.52	5.0
9	240	460.02	5.0		35	1020	458.46	5.0
10	270	459.96	5.0		36	1050	458.40	5.0
11	300	459.90	5.0		37	1080	458.34	5.0
12	330	459.84	5.0		38	1110	458.28	5.0
13	360	459.78	5.0		39	1140	458.22	5.0
14	390	459.72	5.0		40	1170	458.16	5.0
15	420	459.66	5.0		41	1200	458.10	5.0
16	450	459.60	5.0		42	1230	458.04	5.0
17	480	459.54	5.0		43	1260	457.98	5.0
18	510	459.48	5.0		44	1290	457.92	5.0
19	540	459.42	5.0		45	1320	457.86	5.0
20	570	459.36	5.0		46	1350	457.80	5.0
21	600	459.30	5.0		47	1380	457.74	5.0
22	630	459.24	5.0		48	1410	457.68	5.0
23	660	459.18	5.0		49	1440	457.62	5.0
24	690	459.12	5.0		50	1470	457.56	5.0
25	720	459.06	5.0		51	1500	457.50	5.0
26	750	459.00	5.0					

4.4 Construction & Maintenance

4.4.1 Construction –

The proposed channel is to be constructed on hard rock formation. Mechanised excavation of the channel will be done by deploying small shovel and matching dumpers in horizontal slicing system. Hard rock will be drilled and blasted before the excavation. Excavation work can be started from the middle of the channel in either direction. All edge of channel should be rounded and in well shaped. All the statutory safety major should be taken as per the DGMS norms. To minimize the lead, the excavated soil can be utilized for construction of embankment.

Construction of check dam against the nala should be started in non-monsoon season after completion of diversion works of channel and must be completed before on-set of monsoon.

4.4.2 Maintenance

Like all other schemes, this also need to be inspected periodically, so that the repair works if any, can be carried out in time to preclude the chances of the damage, if any during rains.

1). Before the on set of monsoon the top and bed of the diverted channel should be checked thoroughly.

2). Side slopes of the channel should be checked periodically particularly in monsoon season.

3). Before monsoon bed of channel should be cleaned with proper gradient.

4.5 Safety Measures

Garland drain, all along in between the OB dump and diverted nala, must be provided to check the run-off coming directly from embankment.

Signboard should be provided at strategic point to caution the local habitant about the risky involve in going near the nala.

ENCLOSURE 06

Response to issues as discussed during Public Hearing along with financial commitment and year wise breakup & Year Wise breakup & timeline of Action Plan

<table>
<tr><th>SN</th><th>Issues Raised</th><th>Response of PP & Action Plan</th></tr>
<tr><td>01</td><td>Public Hearing was conducted in 2003 for Amrapali OCP at Vananchal College. The Unit was started during 2013-14. As per the conditions, Top Soil should have been preserved but the unit has spread them here and there. Jobs should be given to the land losers per the R&R policy and jobs be provided to them. Cracks develop in the houses and schools as a result of heavy blasting. Siren should be blown and blasting be carried out at specific times. CCL is like our family and with the help of district administration problem will not arise at all. Water sprinkling is not being done which results into air pollution.
Previously doctors use to come but now no doctor is coming. Only 85 persons were provided jobs whereas 1000 persons should have been provided. The unit pays a lot of money to Central Govt., State Govt. and Forest Deptt. ,but project tenants are not given any money. Land is returned to Forest department after mining is over, on similar lines the land should be returned to the tenants as well. Measures must be taken to control Air, Noise and Water Pollution in Amrapali OCP.</td><td>• 2.5-lakh m3 topsoil has been preserved near Honhe OB dump. This topsoil will be used for concurrent biological reclamation.
• R&R is being implemented for PAFs and PAPs as per R&R policy of CIL and RFCTLARR Act.
• Till date 90 PAPs were given employment and 3.43 Cr. has been spent for compensation.
• Blasting has been ensured to be carried out at specified times using Nonel and only after alerts.
• Around 200 health camps were conducted in the last 5 years. Also, a Doctor has been posted at the health centre (Dispensary) in the building of VTC for routine checkups.
• Work awarded for construction of hospital at Amrapali OCP on 03.02.2021 at a cost of Rs. 6.78 crore.
• Specific Air Pollution control measures are being implemented. Further several air pollution control measures with timeline have been suggested in EMP and CER.
• The action plan of EMP & CER is given as annexure.</td></tr>
<tr><td colspan="3"><table>
<tr><th colspan="4">Health Camps in Nearby villages</th></tr>
<tr><th>SN</th><th>Year</th><th>No of Camps</th><th>Beneficiaries</th></tr>
<tr><td>1</td><td>2013-14</td><td>04</td><td>449</td></tr>
<tr><td>2</td><td>2014-15</td><td>06</td><td>1290</td></tr>
<tr><td>3</td><td>2015-16</td><td>11</td><td>1204</td></tr>
<tr><td>4</td><td>2016-17</td><td>76</td><td>3239</td></tr>
<tr><td>5</td><td>2017-18</td><td>41</td><td>1040</td></tr>
<tr><td>6</td><td>2018-19</td><td>76</td><td>2241</td></tr>
</table></td></tr>
<tr><td>02</td><td>The summary (Chart) shown by the Project Officer is not correct. 6 no. of sprinklers are operating , but only 2 tankers operate. Sprinklers operate on some days and thereafter it is stopped..</td><td>• A total 16 sprinklers are operating in and around the mine. 03 no. of 28 KL , 13 no. of 12 KL & 20 KL capacities are deployed at present.
• Further several dust control measures with</td></tr>
</table>

	Assurances by officers of CCL must also be seen on ground level. Shri Peeyush Goyal had promised to provide RO water to the villagers but it has not yet been done. Dust is generated as a result of blasting, it must be reduced. Discussion should be done with land losers and at least basic facilities be provided. After mining is completed , land should be returned to the tenant after top soil over them. Raiyats are involved in false cases. Earlier Doctors used to visit every week but now a days he has not been visiting for the past two years. Medicines are not provided. When Coal is taken for domestic purpose , they are harassed	timeline have been suggested in EMP and CER. The action plan of EMP & CER is given as annexure. • RO water treatment plant has been provided at Kumarang Kalan village. Drinking water from RO is being used by the villagers. Further, drinking water will be provided to nearby villagers under CSR and CER. • Controlled Blasting-using Nonel technique is carried out at specified timings. • Around 200 health camps were conducted in the last 5 years. Also, a Doctor has been posted at the health centre (Dispensary) in the building of VTC for routine checkups. • Work awarded for construction of hospital at Amrapali OCP on 03.02.2021 at a cost of Rs. 6.78 crore. • Further, separate fund provision has been made under CSR and CER.
03	Compensation paid is meagre amount. Only one job provided for every Two Acres of land. Jobs should also be provided to tenancy as well as the GMK land. Discussion should also be done with tenants before mining. Provision of roads, electricity, water ,health have not made. All the facilities should be provided to the five village tenants.	• CCL agrees to give employment to all land losers @ one employment/2 Acre of tenancy/ settled GMK land. • Till date 90 PAPs were given employment and 3.43 Cr. has been spent for compensation. • CSR expenditure confirming to requirement of villagers will be carried out in the neighboring villages of the project.
04	No facility were provided. Project management is only prompt in expansion of the project and not in providing facilities to the tenants. Compensation amount should be finalized first only then the matter of expansion will arise. Road transportation should be stopped and Rail should be adopted for coal transportation. People are falling sick and having breathing disorder as a result of pollution in the area. Hospital facility should be provided in addition to mitigation measures for pollution. Expansion must take place but ensure that discrimination does not happen.	• R&R is being implemented for PAFs and PAPs as per R&R policy of CIL and RFCTLARR Act. • Till date 90 PAPs were given employment and 3.43 Cr. has been spent for compensation. It has been planned to complete R&R by 2023-24. • Construction of pit top railway siding is being taken up as priority and also included in the FMC. • Dust control measures like fixed sprinkling system, mist sprinklers, wind barriers and plantation have been deployed at Shivpur Rly siding and coal transportation road. • Further, additional control measures like dust sweeping machine, PCC topping of transportation road and wheel washing are proposed along with budgetary provisions and timeline. The action plan of EMP & CER is given as annexure. • Around 200 health camps were conducted in

		the last 5 years. Also, a Doctor has been posted at the health centre (Dispensary) in the building of VTC for routine checkups. • Work awarded for construction of hospital at Amrapali OCP on 03.02.2021 at a cost of Rs. 6.78 crore. • Further, separate fund provision has been made under CSR and CER.
05	Project started operating 5-6 years ago but villagers have not benefitted despite this. No one speaks of compensation but expansion is talked about. Air pollution happens as a result of coal transportation by road. Under such circumstances we are not ready for the expansion.	• R&R is being implemented for PAFs and PAPs as per R&R policy of CIL and RFCTLARR Act. • Till date 90 PAPs were given employment and 3.43 Cr. has been spent for compensation. It has been planned to complete R&R by 2023-24. • Dust control measures like fixed sprinkling system, mist sprinklers, wind barriers and plantation have been deployed at Shivpur Rly siding and coal transportation road. • Further, additional control measures like dust sweeping machine, PCC topping of transportation road and wheel washing are proposed along with budgetary provisions and timeline.
06	Five villages are involved in the project. Land losers are pained. Brokers from elsewhere are interfering in these matters. CSR money is also spent outside these villages Kendriya Vidyalaya and Sports complex have been opened using money of CSR. A committee should be constituted in coordination with CCL and then CSR work should be done in consultation with the committee and thereafter expansion should take place. Water sprinkling work is given on contract but the activity is not carried out by the contractors. Outsiders try to befool the vilagers. Management involves the villagers into court cases.	• Binglat and Manwatongri (Tola) are two villages within the project boundary involving R&R. • R&R is being implemented for PAFs and PAPs as per R&R policy of CIL and RFCTLARR Act. • Till date 90 PAPs were given employment and 3.43 Cr has been spent for compensation. It has been planned to complete R&R by 2023-24. • CSR committees have been formed at area level and corporate level to identify and finalise the activities to be taken up under CSR and gets approved by competent authorities
07	CCL management does not provide any facility to the land losers. Past speakers have already raised other points. Those matter must be in focus of the CCL management.	• R&R is being implemented for PAFs and PAPs as per R&R policy of CIL and RFCTLARR Act. • Till date 90 PAPs were given employment and 3.43 Cr. has been spent for compensation. It has been planned to complete R&R by 2023-24.
08	Expansion proposal is from the existing 14.4 MTPA to 25MTPA (Normative)/35 MTPA (Peak) . What have we gained	• Amrapali OCP has been a major source of direct and indirect employment of near by villagers.

	out of the mining operations that have taken place during the last 5-6 years. Water tank has been constructed but tap has not yet been provided. Even the pond has become dirty. Facilities like Roads , Electricity, School ,Hospital etc have not been provided to the land losers Till the problem of GM land is not sorted out, no work would be permitted on such land. The present rate of Rs. 9 Lakhs per Acre of land be enhanced. The amount of compensation and the number of jobs to be provided should be first clarified and then expansion should be undertaken.	• Around Rs.4 Crs has been spent under CSR in the surrounding villages of the project. • R&R is being implemented for PAFs and PAPs as per R&R policy of CIL and RFCTLARR Act. • Till date 90 PAPs were given employment and 3.43 Cr has been spent for compensation. It has been planned to complete R&R by 2023-24. • Construction of Solar power operated deep bore well with recharge pit for Rs. 65 Lakh and construction of ponds in villages is proposed for Rs. 30 Lakh under CSR programme of 2020-21.
09	Our family has 112 acres of land, but jobs have not been provided yet. CCL management should bring some reforms in their Job for land policy. Work should start only after obtaining opinion of all the villagers. Compensation amount should be enhanced from the present 9 lakhs to 15 Lakhs.	• R&R is being implemented for PAFs and PAPs as per R&R policy of CIL and RFCTLARR Act. • Till date 90 PAPs were given employment and 3.43 Cr. has been spent for compensation. It has been planned to complete R&R by 2023-24.
10	River water has become dirty after CCL started work. Cracks have developed in houses due to blasting. Tenants be paid a sum of Rs.3000/ per month for each decimal of land. NTPC Ltd. pays Rs 3000/- per month for each decimal. Compensation has not yet been paid for the past piece of land given to CCL. This may be paid as soon as possible. Compensation also be paid against the Jungle Jhari land .	• Garland drains and toe walls of length 5.5 km has been constructed all along OB dumps to prevent contamination of surface water. • 01 no. of check dam has already been constructed across Dudhmatia nala and 6 additional checkdams proposed across Honhe nala (2 no.) and Binglat nala (4 no.s). The action plan of EMP & CER is given as annexure. • In the upstream as well as downstream of Honhe Nalla Samples of water have been analysed. Regular fortnightly monitoring is being carried out by CMPDIL at NABL accredited lab. All Parameters are mostly within permissible limits • Jobs and compensation will be given as per CIL R&R Policy/ company rules after land verification. • Direct & indirect employment through contractual jobs & skill development programs have been initiated. • Amrapali project has procured 100 sewing machines for distribution to the Panchayats. • PAPs were selected for CETI (Mining and

		Sirdar training to 10 persons) and BTTI (electrician and welder training to 36 persons).
11	Assurance given in the previous Public Hearing may kindly be followed first. CCL is secretly conducting the Public Hearing. This should have been publicized and advertised.	• Public Hearing notice was published by Jharkhand State Pollution Control Board in leading and local dailies well in advance of 30 days.  झारखण्ड राज्य प्रदूषण नियंत्रण पर्षद Jharkhand State Pollution Control Board Web:www.jspcb.nic.in; e-mail:-ranchijspcb@gmail.com लोक सुनवाई की सूचना Proposed Environmental Clearance for enhancement in production from 14.4 MTPA (Peak) to 25MTPA/35 MTPA (Phase-I) of Coal of Amrapali Opencast Coal Mines of M/s Central Coalfields Limited, At-Tandwa, Distt- Chatra, Jharkhand (राजीव लोचन बक्सी) सदस्य सचिव PR 234442 (JHARKHAND STATE POLLUTION CONTROL BORAD) 20-21
12	Fund meant for development purpose has been misused by the brokers. Development is visible after there has been a change in Management of CCL. Development is significant in the past 2 years.	• CCL gives employment & compensation against authenticated land @ 1 employment for every 2 Acres as per R&R policy of CIL. • As per Companies Act, 2% of retained profit or Rs 2/tonne production of previous year is spent under CSR activities.
13	There is no provision for displaced persons in the statement given by Management. Bus has been provided but there is no school. For public hearing the notice was pasted on a house in the village. In 2018 GM had said that job will be provided in 15 days but till date job and compensation has not been provided. There is only High School in Village. It was said that school will be adopted but there is no development.	• All facilities and support will be extended for education of children. • CCL agrees to give employment to all land losers @ one employment/2 Acre of tenancy/ settled GMK land. • Till date employment to 90 affected villagers has been given. • Land compensation of Rs 3.43 crore for 38 acre has been given. • Indirect employment of 1064 has been provided. • As per R&R policy employment will be given against 180 acre of land after expansion of the project. It is an ongoing process, job will be given as and when documents are submitted by affected villagers and as per CIL`s R&R policy.
14	Environment means Jungle-Jhari. Villagers used the forest for employment by using khukhri & pattal. After opening of mine environment has become bad and people are falling sick. Huge irregularities in land has taken	• Regular monitoring of conditions of compliance is done & inspection of RO, MoEF&CC, Ranchi was done on 17.06.2016. • RO plant near Kumrang Kalan village has been installed for drinking water supply to affected villagers.

	place. Job to other persons in place of land owner has been given. Proper solution of this should be done. Information about public hearing was not given to 05 villages. Whatever was said earlier in 2013 has not been completed. Bus should be provided for the benefit for the villagers so that work taken properly.	• A full time doctor has been deputed to facilitate employees and local villagers . • Till date employment to 90 affected villagers has been given. Land compensation of Rs 3.43 crore for 38 acre has been given. • R&R is being implemented for PAFs and PAPs as per R&R policy of CIL and RFCTLARR Act.
15	There is a talk of displacement of Manwa Tongri but no discussion on job and compensation for us. First we should be resettled. The transport road passes through our Tola and generates huge dust. Water sprinkling should be proper	• RO plant near Kumrang Kalan village has been installed for drinking water supply to affected villagers. • A full time doctor has been deputed to facilitate employees and local villagers . • Till date employment to 90 affected villagers has been given. • Land compensation of Rs 3.43 crore for 38 acre has been given. • Indirect employment of 1064 has been provided. • As per R&R policy employment will be given against 180 acre of land after expansion of the project. It is an ongoing process, job will be given as and when documents are given by affected villagers.
16	In my mauza 252 acres of land has been acquired. In addition to 5 villages my village should also be added. Work under CSR should also be done in my village. Due to pollution Asthma and TB has increased in our village. CCL officers say that they do water sprinkling their area.	• As per Companies CSR Policy, 2% of retained profit or Rs 2/tonne production of previous year is spent under CSR activities. • Basic facilities like water supply, road, health & educational facilities etc will be provided under CSR. • A total 16 sprinklers are operating in and around the mine. 03 no. of 28 KL , 13 no. of of 12 KL & 20 KL capacities are deployed at present. • Besides, fixed sprinklers at Ursu check post over a span of 1.2 Km have been commissioned. • Fixed sprinkler on haul road and transportation road at Honhe village is proposed for a cost of 90 Lakh and 100 Lakh respectively . The action plan of EMP & CER is given as annexure. • RO water treatment plant has been provided at Kumarang Kalan village. Drinking water from the RO plant is being used by the villagers.

17	My land has been acquired for Shivpur Rly Siding. No job and compensation provided to us. Money has been deposited in Chatra Treasury. Compensation should be provided to us else we will stop work of Railways.	• Shivpur Railway siding does not fall within the project leasehold boundary. As such, compensation will be settled by the Indian Railways.
18	Invitation was given to us for Public hearing and we have come. Administration should pay attention for our facilities. Without permission of Forest Department money and related work is going on. We will oppose it till its resolution.	• Basic facilities like water supply, road, health & educational facilities etc will be provided under CSR. • RO plant near Kumrang Kalan village has been installed for drinking water supply to the villagers. • A full time doctor has been deputed to facilitate employees and local villagers . • Forestry Clearance (Stage-II) has been issued by MoEF&CC for 531.64 Ha. vide letter no. F.No.08/48/2008/FC Dtd. 12.10.2010. Application for 431.59 Ha submitted to DFO Chatra South on 20.01.20.DFO to forward the proposal.
	This programme is like eye wash. All solutions can be done from this platform. Transport road causes a lot of pollution. AC should organized camp for resolving land of Gair-Mazurwa and Khashmahal. The land should have the name of its owner. Rs. 700 crores is deposited in DMFT what District Administation is doing. Under CSR Rs. 350 crores is with Administration. After approval of Administration is spent. There is no facility for higher education. No add is given by CCL to Vananchal College.	• A total 16 sprinklers are operating in and around the mine. 03 no. of 28 KL , 13 no. of of 12 KL & 20 KL capacities are deployed at present. • Besides, fixed sprinklers at Ursu check post over a span of 1.2 Km have been commissioned • Fixed sprinkler on haul road and transportation road at Honhe village is proposed for a cost of 90 Lakh (by March`21 ) and 100 Lakh (by June`21) respectively. • As per Companies CSR Policy, 2% of retained profit or Rs 2/tonne production of previous year is spent under CSR activities. • Basic facilities like water supply, road, health & educational facilities etc will be provided under CSR.
20	There is lot of discontent among land losers. Local villagers have purchased Trucks/ Haiwa. But all the vehicles are stranded as local sale is stopped. Transportation should be done through our vehicles. CCL has lodged case against us.	• Till date employment to 90 affected villagers has been given. • Land compensation of Rs 3.43 crore for 38 acre has been given. • Indirect employment of 1064 has been provided. • As per R&R policy employment will be given against 180 acre of land after expansion of the project. • This is an ongoing process, job will be given

		as and when documents are given by affected persons.
21	Proper compensation be paid to land owners. Pollution in 04 Panchayat is taken place due to Shivpur Rly Siding. They should also be given compensation. CCL and District Administration should provide proper solution on it. After decision of Govt. the expansion should be taken.	• Till date employment to 90 affected villagers has been given. • Land compensation of Rs 3.43 crore for 38 acre has been given. • Indirect employment of 1064 has been provided. • As per R&R policy employment will be given against 180 acre of land after expansion of the project. This is an ongoing process, job will be given as and when documents are given by affected persons and as per CIL's R &R policy. • Shivpur Railway siding is maintained by Indian Railways.

Proposed Corporate Environmental Responsibility

It has been proposed to expend Rs. 3.00 Crores, under Corporate Environment Responsibility, to address the concerns raised during the Public Consultation held on 17.11.2020, and recommendations of EAC, if any.

The activities shall be undertaken within the project life of 4 years.

SN	Issues raised during PH	Remedial Measures Proposed	Amount in Rs Lakhs
1	R&R issues (Compensation, Employment etc.)	The R&R is being carried out as per the provisions of R&R Policy of CIL	--
2	Air Pollution due to Mining Activities	a) Plantation programme in villages (Ursu, Pachra, Kumrang) situated at close proximity of the project. Dense Plantation may be raised along the village boundary and in available spaces in consultation with Villagers. b) Wind Barrier/Curtains may be installed at strategic locations along the village boundaries to arrest dust	100 50
3	Damage of households due to blasting	a) Effort will be given to carry out periodic Household survey to assess any impacts due to Blasting. Financial provisioning is made for carrying out repairs, strengthening work, in case of any damage	50
4	Hospital and Healthcare	a) Health Camps in nearby villages	50
5	Education & Skill Development	a) Skill development trainings will be conducted under CER	50
Total			**300**

Proposed Corporate Social Responsibility

Year	Proposed Coal Production (MT)	Estimated CSR expenditure in Lakh Rs. (Approx.)	Fields of Work
Year 1	20	400	• Education facilities including grant of schools, providing education kits, running of schools etc • Water Supply and rain water harvesting works, wells, ponds, hand pumps and tube wells • Health Care and vaccination, awareness camp, mobile medical camp, Immunisation, medicine etc. • Environnent Protection i.e plantation etc. • Social Empowerment like Community centre, Literacy drive, shopping complex. • Infrastructure Development like road, bridge, repairing of school, drains, electric line etc. • Sports Culture like village stadium village stadium, grant to village sports body, organizing sports meet • Grant to NGO for community development • Distribution of Household Solar Kit units in nearby villages. • Miscellaneous welfare for adopted villages • Construction of Solar power operated deep bore well with recharge pit and construction of ponds
Year 2	20	400	
Year 3	25	500	
Year 4	14.50	290	

As per the guidelines of DPE vide OM No. CSR-08/0002/2018-Dir (CSR) dated 10th December 2018, CCL is required to undertake CSR work giving priority to 4 aspirational districts in Jharkhand. These districts are Chatra, Latehar, Ranchi and Ramgarh. Accordingly, CCL is taking up projects from "Shelf of Projects" of Chatra and Latehar districts amongst others. The "Shelf of Projects" is decided by district administration which is in line with priority government welfare schemes for the district. In Chatra district ,where Amrapali Project is located some of the CSR schemes being undertaken in line with State Government Welfare Schemes are given below:

i. Upgradation of 100 Anganwadi Centres
ii. Pre delivery waiting room in hospitals
iii. Water Supply in villages
iv. Distribution of food grain and other items during Covid 19 crisis.
v. Sanitary Napkin vending machines in schools, etc.

vi. HMV training academy at Tandwa.
vii. Rehabilitation and physiotherapy unit for differently abled (Aids for Loco motion, visually impaired and hearing disability
viii. Hospital upgradation at Tandwa.
ix. Model schools etc.,

Proposed R & R Plan

Around 260 PAFs have been identified in the villages Bingalt and Manwatongri (Tola) falling within the project boundary for R&R. Details are as given below.

SN	Village	PAFs	Status
1	Binglat	210	R&R site identified near Serendag village. Area of R&R site is 36 Ha. Resettlement will be completed will be completed by 2023-24
2	Manwatongri	50	

The total cost for R & R Activity is estimated to be approximately 210.80 Crores.

Description	Total No.	Site preparation	Year of Shifting		
			2021-22	2022-23	2023-24
Rehabilitation of PAFs	260	2021-22	50	110	100

Till date, direct employment has been provided to 90 PAPs under Amrapali OCP. It includes 16 employments to SC and ST PAPs. Direct employment is an ongoing process and is as per R&R Policy of CIL. In addition indirect employment with outsourcing agencies is also provided. CCL being a Government of India PSU provides equal opportunity in employment and other benefits as per R&R policy of CIL and Government norms.

R&R Policy of CIL

Compensation For Land
One Employment per 2 acres to land losers (plots can be clubbed together) Or monetary compensation @ Rs.5.0 Lakh per acre subject to a minimum of Rs.0.50 Lakh. The compensation can be paid in form of annuity also on monthly, quarterly, annually etc upto 60 years of age or life of project, whichever is earlier.
Note: A person receiving employment forgoes all claims to monetary compensation and a person receiving monetary compensation forgoes all claims to employment.
Compensation For Homestead
Compensation for homestead building as per standard valuation method under LA Act subject to a minimum of Rs. 2 Lakh per household
Payment of Rs 3.0 Lakh in lieu of alternate housing site, assistance in designing & shifting, compensation for construction cattle shed and working shed etc.
Subsistence allowance to each affected family @ 25 days Minimum Agricultural Wages per month for one year.
Compensation For Sharecroppers, Land lessees, Tenants, Day labourers, Landless tribals etc. @ Rs. 5 lakh per household in lieu of livelihood loss.
Affected landless tribal families will be provided one time financial assistance equivalent to 500 days MAWs as a compensation for loss of customary rights.
Assistance to PAPs to take up non-farm self employment through petty contracts or formation of co-operatives.
Contractors will be persuaded to give jobs to eligible PAPs on preferential basis.

Proposed Environmental Management Plan

Year	**Capital Cost of Environmental Control Measures** **Activity**	**Details**	**Estimated Capital Cost in Rs. Lakhs**	**Tentative time line of Completion**
2021-22	Fixed sprinkling system of on Haul Road	1.30 km length along Haul road at Honhe side	90	Tender Floated. Work Order to be Issued. Tentative date of Completion: March 2021
	Fixed sprinkling system on Coal tranportation road at Honhe Village	1.3 km length	100	Tender Finalized. Tentative date of Completion: June 2021
	Fog Canon at Coal stock yard	1 no.	80	July 2021
	PCC Topping of Coal transportation road	5 km Length and 10 m Width of road	900	Tender Finalized. Tentative date of Completion: June 2021
	Road Sweeping Machines on CTR	2 nos.	150	Sept' 2021
	Vehicle wheel washing system on CTR	2 nos. on both ends of CTR	90	July 2021
	Wind Barriers along stock yard	1200 m along coal stock yard and	60	Sept 2021
	Wind Barriers along the Project boundary at Pachra Village and Ursu Village	3.1 km and 7 m Height	155	Sept 2021
	Wind Barriers along Coal Transportation road	Around 2000 m near Honhe village	100	July 2021
	Construction of Check dams	2 No.of Checkdams on Honhe nala and 4 no. of Checkdams on Binglat Nala	350	Tender Floated. Work Order to be Issued. Tentative date of Completion: March 2021
	Toe wall, Granland Drain and settling pond	1.5 km Toe wall and garland drain along OB dump,Top soil Dump	60	July 2021
	Diversion of Dudhmatia Nala	1500 m nala Diversion along the northern boundary of project	164.36	May-21
	Garland Drain	In between the OB dump and	60	May-21

		diverted nala of Length 1500m		
	Embankment	Earthern Embankment with stone pitching and Toe wall along nala of Length 3100 m anf Height 3 m	210	Jun-21
	Piezometers	Additional 05 no. of Piezometers have been proposed to monitor the ground water level.	40	Tender Floated. Work Order to be Issued. Tentative date of Completion: March 2021
	Rain Water Harvesting System	Roof top rain water harvesting system at 35 locations	45	July 2021
	Continuous Air Quality monitoring systems	CAAQMS and Continuous PM10 Analyzer	125	Tender under process.
	Green Belt	Green belt along project, road, nala and embankment 17.42 Ha,	696.8	Monsoon 2021
	Afforestration	6.00 Ha	82	Monsoon 2021
	3-tier Avenue Plantation along Coal Transportation road	7.5 Ha of Avenue Plantation on CTR	30	Monsoon 2021
2022-23	Sewage Treatment Plant	Proposed township will be provided with integrated sewage treatment plant.	200	Construction work of colony has been started by NBCC Tentative date of Completion: March 2023
	Embankment along Barki River	Embankment will be provided along the Barki river and green belt will be developed.	500	Mar-23
	Green Belt	Green belt along project 7.20 Ha	288	
	Plantation on Reclaimed Land	10.16	35.56	Monsoon 2022
2023-24	Plantation on reclaimed land	50 Ha	175	Monsoon 2023
2024-25 & Post	Plantation on reclaimed land	184 Ha	644	Monsoon 2024 & Post Closure

Closure				
Conservation of Flora and Fauna		Conservation Measures for schedule-I species	4236	Throughout the life of Mine
Total EMP Cost			**9666.72**	

Estimated Revenue Cost of Environmental Control Measures

S No.	Particulars	Annual Revenue Cost (Rs Lakh)
1	Environmental Monitoring Cost	46.96
2	Plantation Maintenance Cost	46
3	Operation and Maintenance of Air Pollution control Measures	85
4	Maintenance cost for ETP and STP	15
5	Maintenance of RWH, Catch drains, Storm water drains and other development measures in Township	15
Total Revenue Cost		**207.96**

ENCLOSURE 07

S.No 08: The PP should submit the number of saplings to be planted, area to be covered under afforestation & green belt, location of plantation, target for survival rate and budget earmarked for the afforestation & green belt development.

In addition to this PP should show on a surface plan (5-year interval for life of mine) of suitable scale the area to be covered under afforestation & green belt clearly mentioning the latitude and longitude of the area to be covered during each 5 years.

The capital and recurring expenditure to be incurred needs to be submitted. Plantation plan should be prepared in such a way that 80% of the plantation to be carried out in first 5 years and for the remaining years the proposal for gap filling. The seedling of height not less than 2 meters to be selected and accordingly cost of plantation needs to be decided.

In addition to this plantation in the safety zone at lease boundary the plantation should be completed within 2 years only.

Reply:

As a part of land restoration process, it has been proposed to bring approximately 281.28 Ha area to bring under plantation.

Table: Post-Mining Land Use Plan

Land Use During Mining		**Proposed Land Use After Reclamation**	
Particulars	**Area (Ha)**	**Particulars**	**Area (Ha)**
Quarry	425.22	Backfilled Area Reclaimed With Plantation	178.00
		Void/ Haul roads left over for future use	247.22
External Dump	89.16	Reclaimed with plantation	77.16
		Land for Future Use	12
Industrial Area	60.75	Industrial area for future use	60.75
Safety Zone/green belt	28.92	Plantation on Safety Zone/ Green Belt	26.12
		Land for Future Use	2.8
Embankment/Garland Drain/Diversion of Public Road/Nala Diversion	15.82	Land for public Use	15.82
Total	**619.87**	**Total**	**619.87**

The detailed year-wise Plantation action Plan is as given below.

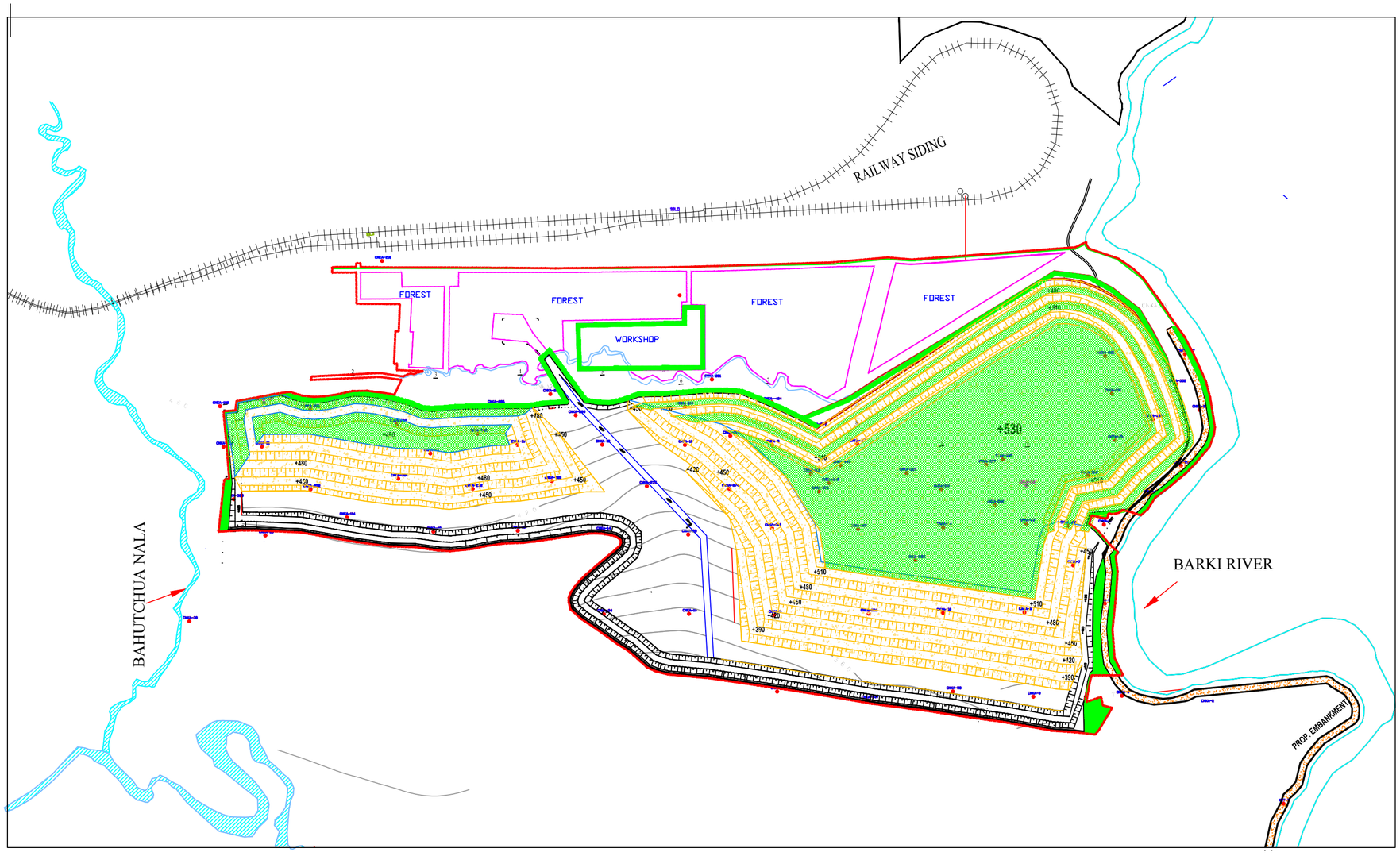
Table: Year-wise Plantation Plan

Year	Green Belt& Safety Zone		Backfilled Area		Infrastructure		External Dump		Total		Cost to be incurred in Rs. Lakhs
	Area (Ha)	Trees (000)	Area (Ha)	Trees (000)	Area (Ha)	Trees (000)	Area (Ha)	Trees (000)	Area (Ha)	Trees (000)	
Plantation carried out till date	**1.50**	3.75	0.00	0.00	0.00	0.00	**5.00**	12.50	6.50	16.25	
Y1	17.42	27.87	0.00	0.00	0.00	0.00	6.00	15.00	23.42	42.87	717.80
Y2	7.20	11.52	0.00	0.00	0.00	0.00	10.16	25.40	17.36	36.92	323.56
Y3	0.00	0.00	40.00	100.00	0.00	0.00	10.00	25.00	50.00	125.00	175.00
Y4	0.00	0.00	30.00	75.00	0.00	0.00	10.00	25.00	40.00	100.00	140.00
Post Closure Y5	0.00	0.00	35.00	87.50	0.00	0.00	12.00	30.00	47.00	117.50	164.50
Post Closure Y6	0.00	0.00	35.00	87.50	0.00	0.00	12.00	30.00	47.00	117.50	164.50
Post Closure Y7	0.00	0.00	38.00	95.00	0.00	0.00	12.00	30.00	50.00	125.00	175.00
Total	**26.12**	**43.14**	**178.00**	**445.00**	**0.00**	**0.00**	**77.16**	**192.90**	**281.28**	**681.04**	**1860.36**

During monsoon 2021, 23.42 Ha of plantation will be raised over backfilled area, industrial infrastructure, road & green belts. During monsoon 2022, 17.36 Ha. & during monsoon-2023 50 Ha of plantation will be raised over backfilled area, industrial infrastructure, road & green belts.

The list of the species recommended for afforestation on the overburden and other vacant areas is as given below:

Botanical Name	***Local /Trade Name***	***Mitigation value***
Acacia ariculiformis	Babool	Dust pollution
Albizialebeck	Sirish	Dust pollution
Madhucalatifolia	Mahua Tree	Dust pollution
Aeglemarmelos	Bael tree	Dust pollution
Syzygiumcumini	Amrud	Dust pollution
Cassia fistula	Golden shower	Dust pollution
Ailanthusexcelsa	Maharukha	Dust pollution
Buteamonosperma	Flame of the Forest	Dust pollution
Dalbergiasisoo	Indian Rose wood	Dust pollution
Dendrocalamusstrictus	Hard bamboo	Wind barrier
Bambusaaurundinacea	Hallow bamboo	Wind barrier



Land Use As Per Approved Plan		Proposed Land Use After Reclamation	
Particulars	**Area (Ha)**	**Particulars**	**Area (Ha)**
Quarry	425.22	Backfilled Area Reclaimed With Plantation	178
		Void/ Haul roads left over for future use	247.22
External Dump	89.16	Reclaimed with plantation	89.16
Industrial Area	60.75	Industrial area for future use	60.75
Safety Zone/green belt	28.92	Plantation on Safety Zone/ Green Belt	26.12
		Land for Future Use	2.8
Embankment/Garl and Drain/Diversion of Public Road/Nala Diversion	15.82	Land for public Use	15.82
Total	**619.87**	**Total**	**619.87**

LEGENDS

SL. No.	PARTICULARS	SYMBOL
01	BORE HOLE	
02	QUARRY BOUNDARY	
03	FLOOR CONTOUR	
04	SURFACE CONTOUR	
05	RIVER / NALA	
06	PROJECT BOUNDARY	
07	RAILWAY LINE	
08	ROAD	
08	Plantation on OB Dump	

ALL DIMENSIONS ARE IN METERS

Plate XV

Customer: CENTRAL COALFIELDS LIMITED

Job Title: AMRAPALI EXPANSION OCP (PHASE-I) — Job No.

Subject: POST MINING LANDUSE PLAN

Activity	Name	Designation	Signature	Date
Created				
Created	P K SINHA	Chief, M. (E)		31-08-2015
Checked	J CHAKRAVARTY	HOD (O/C)		31-08-2015
Approved	Dr. A. Sinha	R.D, RIII		31-08-2015

Scale: 1 : 10000 — Sheet

cmpdi A Mini Ratna Company — **CMPDI, R.I.-III** A MINI RATNA COMPANY

Drg.No. RIII OCM 0 0 1 2 7 3 — Rev.No.

Ficusbenghalensis	Banayan Tree	Soil erosion
Ficusreligiosa	Peepal Tree	Soil erosion
Azadirachtaindica	Neem tree	Soil erosion
Meliaazaderach	Bakneem	Soil erosion
Terminaliaarjuna	Arjun	Soil erosion
Terminaliatomentosa	Saj	Noise barrier
Ailanthus excelsa	Mahurkha	Noise barrier
Tectonagrandis	Teak wood	Noise barrier

3-tier plantation will be done all along the periphery of the colony for dust and noise attenuation. This will protect colony from air & noise pollution.

The detailed summary of cost to be incurred for the proposed plantation programme is as given below:

Proposed			
	Type	**Area in Ha**	**Cost inRs. Lakhs**
Capital	Afforestation	250.16	875.56
	Green belt Development	24.62	984.8
	Total	**274.78**	**1860.36**
Revenue	Yearly Maintenance of Plantation		**46**

ENCLOSURE 08

Demographic analysis of sample population:

1. Core zone/ project area of Amrapali OCP consists of 5 villages and the buffer zone includes 69 villages within 10 km radius around the mine. These villages are listed below with the population as per Census of India 2011.

Table 1 : List of Villages with Households and Population

SNo	Zone	Village	Households	Total Population	Male	Females
1	Core zone	Binglat	82	498	261	237
2		Honhe	162	870	450	420
3		Kumarang Khurd	212	998	505	493
4		Kumarang Kalan	250	1170	586	584
5		Ursu	108	581	286	295
6	Buffer zone	Pokla Alias Kasidih	484	2639	1349	1290
7		Kabra	335	1802	922	880
8		Barkuti	116	579	303	276
9		Saradhu	1068	5544	2860	2684
10		Hechabalia	102	503	257	246
11		Koed	459	2252	1164	1088
12		Sihvpur	51	266	137	129
13		Ghaghra	60	370	195	175
14		Brinda	106	644	330	314
15		Katahj Misraul	72	363	164	199
16		Kishunpur	119	613	317	296
17		Madhwapur	13	69	30	39
18		Serangdag	235	1189	623	566
19		Garilaung	789	4323	2278	2045
20		Nawa Khap	69	395	198	197
21		Tesar Chepa	156	821	410	411
22		Bad Bigha	126	761	401	360
23		Ral	96	530	273	257

24		Bukru	175	853	442	411
25		Daridag	97	546	275	271
26		Giddi	26	132	72	60
27		Nawadih Alias Teliadih	669	3621	1891	1730
28		Khadhai	288	1631	847	784
29		Misrol	390	2316	1210	1106
30		Tektha	194	1014	520	494
31		Soparam	324	1567	823	744
32		Kurlonga	211	1021	501	520
33		Kundi	123	598	309	289
34		Devalgara	39	179	89	90
35		Naudiha	91	473	237	236
36		Kodhamdiri	109	549	261	288
37		Urda	250	1377	676	701
38		Sirsai	333	1784	930	854
39		Naiparam	297	1833	854	979
40		Dundua	159	747	374	373
41		Tandwa	1126	6475	3438	3037
42		Kamta	402	2455	1261	1194
43		Masilaung	68	457	247	210
44		Raham	928	5046	2574	2472
45		Kusamha	79	428	224	204
46		Banalat	201	1149	594	555
47		Manatu	237	1230	608	622
48		Bamwar	105	614	313	301
49		Tarhesa	47	212	107	105
50		Pandu	556	2795	1434	1361
51		Balia	17	81	40	41
52		Tunda	41	192	96	96
53		Chatti Bariatu	602	2897	1508	1389
54		Jordag	397	2051	1045	1006
55		Loisukwar	23	82	36	46
56		Ome	281	1357	693	664
57		Pagar	564	2756	1394	1362
58		Kabed	201	959	483	476
59		Keredari	716	3693	1912	1781

60		Gopda	138	733	362	371
61		Dumri	52	505	134	371
62		Pandepura Kalan	126	480	350	130
63		Porra	79	394	209	185
64		Joko	223	1201	619	582
65		Karali	350	1688	879	809
66		Bhadaikhap	65	279	144	135
67		Peto	956	5054	2610	2444
68		Sayal	167	845	430	415
69		Ara	413	2205	1113	1092
Total			**18205**	**96334**	**49467**	**46867**

2. Sample survey:

In order to understand the actual socio economic status of the villagers, household sampling has been carried out in 12 villages in core and buffer zones in order to ensure effective representation. The sample survey was done in 3 out of 5 villages in core zone and 9 villages in buffer. A total of 254 households were sampled.

Table 2 Details of Household sampling

SNo	Village	Households	Sample
Core Zone			
1	Binglat	82	35
2	Honhe	162	9
3	Kumarang Khurd	212	14
Buffer Zone			
4	Pokla Alias Kasidih	484	24
5	Barkuti	116	11
6	Saradhu	1068	30
7	Koed	459	12
8	Garilaung	789	20
9	Tandwa	1126	18
10	Chatti Bariatu	602	17
11	Pagar	564	32
12	Keredari	716	32
Total		**18205**	**254**

3. Socio-Economic Profile of the Study Area (based upon sample)

Demographic Profile

Table 3 Demographic Profile

Indicators	2011
Total Households	18205
Total Population	96334
Household Size	5.3
Sex Ratio	947
Child Population (≤6 years) (%)	13.4
Scheduled Caste (%)	19.2
Scheduled Tribe (%)	5.0
Literate Persons (%)	38.2
Total Workers (%)	37.8
Total Main Workers (%)	38.3
Total Marginal Workers (%)	61.7
Total Non-Workers (%)	62.2

The main religion of sampled villages is Hinduism. There has been an evident change in the type of family in the core and buffer zones. All the households in the core zone are nuclear families, 64.3% of the households in the buffer zone are nuclear families and 35.7% of the households are joint families. The villages also have considerable number of scheduled castes and tribes population, about 19% and 5 % respectively. The main tribes are Oraon and Munda.

Table 4 Caste Structure at Surveyed Areas

Name of villages	SC	ST	GEN	OBC	Muslim	Total
Core Zone						
Binglat	12		3	20		35
Honhe		3	3	3		9
Kumarang Khurd			6	8		14
Buffer Zone						
Pokla Alias Kasidih	6	3	5	7	3	24
Barkuti		3	3	5		11
Saradhu	3	7	2	18		30
Koed	4		6	1	1	12
Garilaung	1	2	3	14		20
Tandwa	5	3	5	5		18
Chatti Bariatu			5	11	1	17
Pagar	3	4	4	20	1	32
Keredari	3	3	9	13	4	32
Grand Total	**37**	**28**	**54**	**125**	**10**	**254**

The study revealed that the plot of land in all the cases both in core as well as buffer zone is owned by the household. In the core zone, 100% of the houses are self-owned in comparison to 93.3% of the houses being owned by the resident and 6.7% are rented. It was found that all the 70 % houses in the core zone are semi-pucca where as in the buffer zone 66.7% of the houses are semi pucca and the rest of the houses (33.3%) are kutcha houses. This may be because of population in the core zone is in a better status compared to those living in the buffer zone.

Table 5 Type of Dwellings at Surveyed Area

Name of Village	Kutcha	Semi-Pucca	Pucca	Total
Core Zone				
Binglat	11	24	0	35
Honhe	3	6		9
Kumarang Khurd	4	8	2	14
Buffer Zone				
Pokla Alias Kasidih	8	13	3	24
Barkuti	3	4	4	11
Saradhu	9	11	10	30
Koed	4	5	3	12
Garilaung	6	14		20
Tandwa	6	8	4	18
Chatti Bariatu	5	5	7	17
Pagar	10	13	9	32
Keredari	10	12	10	32
Grand Total	79	123	52	254

Table 6 Age-Sex Distribution

Name of villages	Age Group									
	0-5		6-18		19-40		41+		Total	
	M	F	M	F	M	F	M	F	M	F
Core Zone										
Binglat	13	14	13	9	26	17	21	12	73	52
Honhe	2	4	3	3	7	6	4	4	16	17
Kumarang Khurd	5	6	5	5	10	8	7	4	27	23
Buffer Zone										
Pokla Alias Kasidih	12	9	12	9	18	13	11	14	53	45
Barkuti	4	3	4	4	7	4	7	5	22	16
Saradhu	14	10	14	9	23	14	20	19	71	52
Koed	5	4	4	6	7	5	7	6	23	21
Garilaung	16	7	11	11	22	14	17	13	66	45
Tandwa	13	13	13	14	23	13	22	14	71	54
Chatti Bariatu	7	6	4	5	14	6	11	10	36	27
Pagar	6	5	7	9	16	12	15	12	44	38
Keredari	9	15	13	11	21	13	21	19	64	58
Grand Total	106	96	103	95	194	125	163	132	566	448

Educational Background and Employment Status

Table 7 Educational Background

Name of villages	Literate		Illiterate		Secondary & above		Professional		M	F	Total
	M	**F**	**M**	**F**	**M**	**F**	**M**	**F**			
Core Zone											
Binglal	30	20	15	12	15	6			60	38	98
Honhi	6	6	4	7	4	1			14	14	28
Kumarang Khurd	7	10	5	4	10	3			22	17	39
Core Zone											
Pokla Alias Kasidih	15	12	13	16	13	8			41	36	77
Barkuti	6	6	5	7	7				18	13	31
Saradhu	30	12	11	23	16	7			57	42	99
Koed	9	4	2	12	7	1			18	17	35
Garilaung	24	11	10	18	16	9			50	38	88
Tandwa	29	12	12	23	17	6			58	41	99
Chatti Bariatu	10	10	5	11	14				29	21	50
Pagar	17	23	8	10	13				38	33	71
Keredari	28	23	9	12	18	8			55	43	98
Grand Total	**211**	**149**	**99**	**155**	**150**	**49**			**460**	**353**	**813**

Table 8 Employment Pattern

Villages	**Labourer**	**Office Worker**	**Agriculture**	**Business**	**Others**	**Total**
Core Zone						
Binglat	1	1	7	7	19	35
Honhe	2	5			2	9
Kumarang Khurd	3		3	2	6	14
Buffer Zone						
Pokla Alias Kasidih	6	0	3	10	4	23
Barkuti	4	0		7		11
Saradhu	4	2	1	15	5	27
Koed	3		1	4	4	12
Garilaung	6	2		9	7	24
Tandwa	3	3		20	2	28
Chatti Bariatu	2	1	4	9		16
Pagar	3		1	14	3	21
Keredari	5	3	4	17	12	41
Grand Total	42	17	24	114	64	261

Livelihood

Primary occupation in the core zone is mainly self employed in agricultural and allied activities and small business. Population living in the buffer zone is engaged in occupations like driver (11.6%), Farmer (11.8%), Labour (63.2%) and others (11.8%).

Table 9 Household Income (per month) at Surveyed Areas

Name of villages	<1500	1500-2999	3000-4999	5000-6999	7000+	Total
Core Zone						
Binglat	8	19			8	35
Honhe	4	1	2	2		9
Kumarang Khurd	9	1	3	1		14
Buffer Zone						
Pokla Alias Kasidih	7	6	1	10		24
Barkuti	7	2	1		1	11
Saradhu	9	1	14	6		30
Koed	7	2	2		1	12
Garilaung	13	4	1	1	1	20
Tandwa	5	3	10			18
Chatti Bariatu	2	5		9	1	17
Pagar	8	10	6	7	1	32
Keredari	14	9	2	6	1	32
Grand Total	**93**	**63**	**42**	**42**	**14**	**254**

Physical Infrastructure

i. Water

Primary Source	Percentage (%)
House Connection	5.88
Own hand pump	11.77
Public hand pump	29.41
Own dug well	11.77
Public dug well	35.29
Public Pond	5.88
Total	**100.0**

ii. Drainage and Sanitation

Most of the villages are not very clean. People in the villages complained about absence of drainage and flowing water on the streets, inner paths and access roads. At few locations clogging of channels, made by local people was observed. On an average at the maximum 41% of the households do not have latrines in their houses.

iii. Electricity

In the buffer zone, 40% of the households have electricity and 60% households do not, but those who have electricity do not have any electric meter.

iv. *G*overnment Schemes and Benefits

In the core zone, all the households reported of having ration card, where as in the buffer zone about 87% households reported of having ration card and the rest (13%) denied having ration card.

v. Observation :

There are 69 villages in buffer zone. Most of the villagers in adjacent villages in buffer zone are involved in mining related support activities. Many household have got employment against their land particularly in adjacent villages. Therefore, they are in relatively better socio-economic situation. However, economic prosperity in many instances has not resulted in to better education to children.

CSR activities are carried out continuously. More emphasis of CSR should be in drinking water, sanitation, education, skill development, sports and health.

4. ACTION PLAN FOR R&R (including SC and ST)

Around 260 PAFs have been identified in the villages Binglat and Manwatongri Tola (Tola of Kumrangkala) falling within the project boundary for resettlement. Details are as given below.

S.no	Village	PAFs	Status
1	Binglat	210	R&R site identified near Serendag village. Area of R&R site is 36 Ha. Resettlement will be completed will be completed by 2023-24
2	Manwatongri Tola	50	

R&R Action Plan

Description	Total No.	Site preparation	Year of Shifting		
			2021-22	2022-23	2023-24
Rehabilitation of PAFs	260	2021-22	50	110	100

Proposed facilities at R&R site:

i. All-weather road connectivity to site and roads within the resettled villages
ii. Drainage as well as sanitation facilities
iii. Treated , piped facility for drinking water for each family
iv. Cattle shed with facilities for water and grazing
v. Fair Price Shops

vi. Post Offices
vii. Individual single electric connections
viii. Road / public lighting
ix. Anganwadi Kendra providing child
x. Primary and middle School
xi. Dispensary
xii. Playground
xiii. Community centre
xiv. Temple / Sarana sthal
xv. Cremation ground

The compensation is proposed as per R&R Policy of CIL. The villages - Binglat and Manwatongri Tola (Tola of Kumrangkala) will be shifted as a unit and similar facilities will be provided to SC and ST PAPs also. In addition separate Sarana Sthal is proposed for ST population of the at the R&R site.

Action plan for employment including SC and ST.

Till date, direct employment has been provided to 90 PAPs under Amrapali OCP. It includes 16 employment to SC and ST PAPs.

Direct employment is an ongoing process and is as per R&R Policy of CIL. In addition indirect employment with outsourcing agencies is also provided.

CCL being a Government of India PSU provides equal opportunity in employment and other benefits as per R&R policy of CIL and Government norms.

R&R Policy of CIL

Compensation For Land
One Employment per 2 acres to land losers (plots can be clubbed together) Or monetary compensation @ Rs.5.0 Lakh per acre subject to a minimum of Rs.0.50 Lakh. The compensation can be paid in form of annuity also on monthly, quarterly, annually etc upto 60 years of age or life of project, whichever is earlier.
Note: A person receiving employment forgoes all claims to monetary compensation and a person receiving monetary compensation forgoes all claims to employment.
Compensation For Homestead
Compensation for homestead building as per standard valuation method under LA Act subject to a minimum of Rs. 2 Lakh per household
Payment of Rs 3.0 Lakh in lieu of alternate housing site, assistance in designing & shifting, compensation for construction cattle shed and working shed etc.
Subsistence allowance to each affected family @ 25 days Minimum Agricultural Wages per month for one year.
Compensation For Sharecroppers, Land lessees, Tenants, Day labourers, Landless tribals etc. @ Rs. 5 lakh per household in lieu of livelihood loss.
Affected landless tribal families will be provided one time financial assistance equivalent to 500 days MAWs as a compensation for loss of customary rights.
Assistance to PAPs to take up non-farm self employment through petty contracts or formation of co-operatives.

Contractors will be persuaded to give jobs to eligible PAPs on preferential basis.

5. Alignment of CSR schemes with State Government Welfare Program: As per the guidelines of DPE vide OM No. CSR-08/0002/2018-Dir (CSR) dated 10th December 2018, CCL is required to undertake CSR work giving priority to 4 aspirational districts in Jharkhand. These districts are Chatra, Latehar, Ranchi and Ramgarh. Accordingly, CCL is taking up projects from "Shelf of Projects" of Chatra and Latehar districts amongst others. The "Shelf of Projects" is decided by district administration which is in line with priority government welfare schemes for the district. In Chatra district ,where Amrapali Project is located some of the CSR schemes being undertaken in line with State Government Welfare Schemes are given below;

i. Upgradation of 100 Anganwadi Centres.
ii. Pre delivery waiting room in hospitals.
iii. Water Supply in villages.
iv. Distribution of food grain and other items during Covid 19 crisis.
v. Sanitary Napkin vending machines in schools.
vi. HMV training academy at Tandwa.
vii. Rehabilitation and physiotherapy unit for differently abled (Aids for Loco motion, visually impaired and hearing disability
viii. Hospital upgradation at Tandwa.
ix. Model schools etc.,

ENCLOSURE 09

BIOLOGICAL MANAGEMENT PLAN

OF

AMRAPALI EXPANSION OCP (PHASE-I)

(Magadh-Amrapali Area)
(Project Area:619.87 Ha
Capacity: 25 MTPA)

CENTRAL COALFIELDS LIMITED
(A Subsidiary of Coal India Limited)

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CONTENTS

Chapter 1
Anticipated Impacts and Mitigation Measures

1.1 Core Zone

1.1.1 Impact on Agricultural – Core Zone

Amrapali OCP is an existing project and the proposed expansion is an increase in the production level within the same project area of 619.87 Ha. The Agricultural land within the core zone is around 73 Ha. The present land use as per remote sensing study is as given below.

Type of Land	Area in Ha
Forest Land	30.00
Scrubs	88.00
Plantation Area	8.00
Agricultural land	73.00
Mining Area	288.00
Settlement	25.00
Water Body	3.00
Waste Land	104.87
Total	**619.87**

The exixting agricultural land (around 73 Ha) within core zone will likely be utilized for minig and allied activities. This will surely lead to decrease in the agricultural productivity of the core zone. However, efforts will be made to biologically restore the degraded land in the post-mining stage.

The Landuse details during mining is as given below.

Description	Forest Area in Ha.	Non-Forest Area in Ha.	Total Area in Ha.
Quarry	392.75	32.47	425.22
Dump	60.14	29.02	89.16
Industrial Area (W/S, S/S, Haul Road etc)	56.75	4	60.75
Safety Zone / Green belt	14.7	14.22	28.92
Embankment/Garland Drain/Diversion of Public Road/ Nala Diversion	7.3	8.52	15.82
Total	**531.64**	**88.23**	**619.87**

==========

Note: Total forest land within the project area is 531.64 Ha, obtained Stage II clearance vide letter no. F.no:8-48/2008-FC dt. 12.10.2010.

Land Reclamation

Land reclamation and enrichment through plantation will be done to bring back the land-use as similar as possible to the pre-mining land use. For this purpose, efforts will be made to bring approximately 293.28 Ha area to bring under plantation.

Post-Mining Land Use Plan

Land Use During Mining		**Proposed Land Use After Reclamation**	
Particulars	**Area (Ha)**	**Particulars**	**Area (Ha)**
Quarry	425.22	Backfilled Area Reclaimed With Plantation	178.00
		Void/ Haul roads left over for future use	247.22
External Dump	89.16	Reclaimed with plantation	77.16
		Land for Future Use	12
Industrial Area	60.75	Industrial area for future use	60.75
Safety Zone/green belt	28.92	Plantation on Safety Zone/ Green Belt	26.12
		Land for Future Use	2.8
Embankment/Garland Drain/Diversion of Public Road/Nala Diversion	15.82	Land for public Use	15.82
Total	**619.87**	**Total**	**619.87**

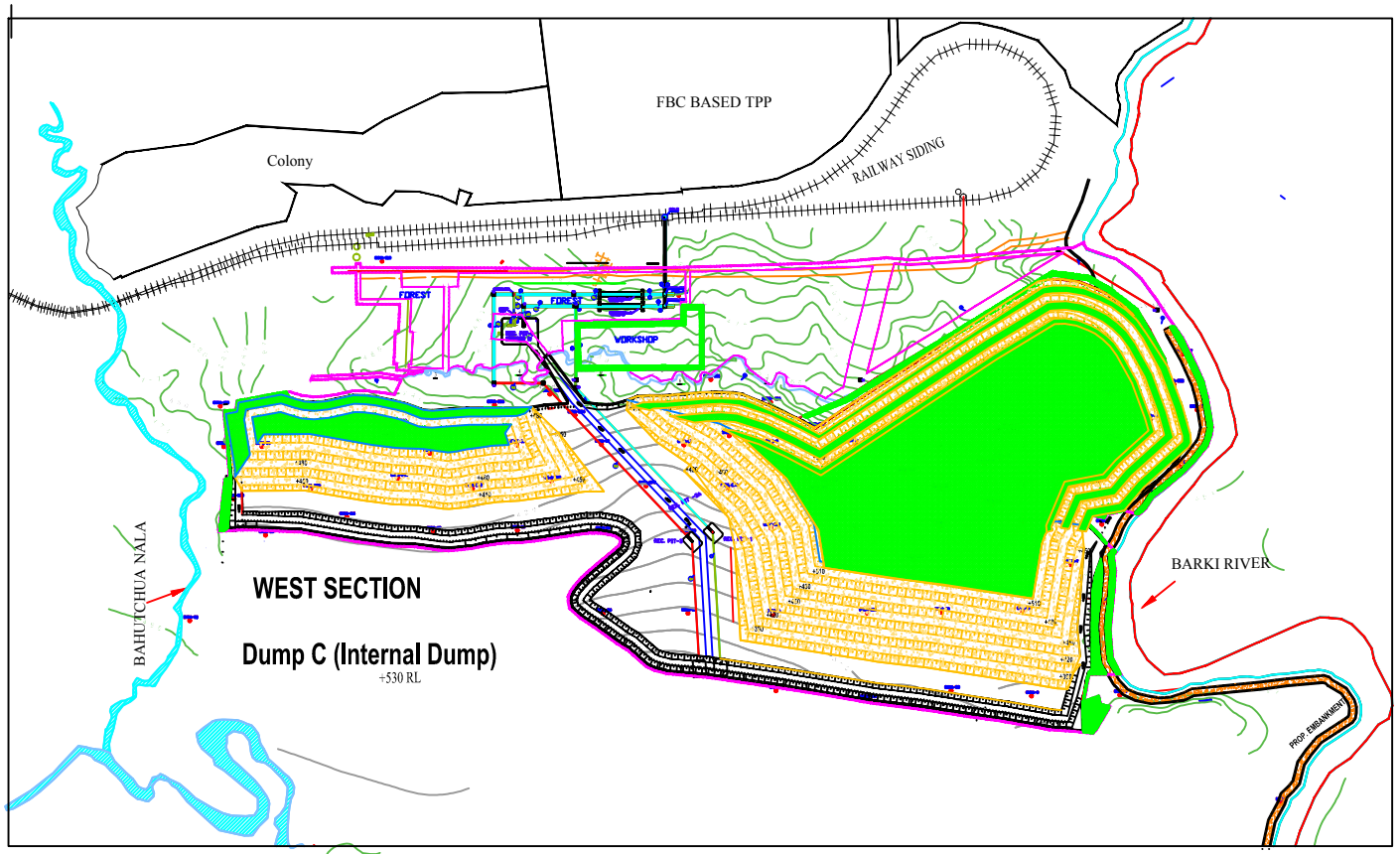
Biological Reclamation of Mined Out Area

For successful enrichment of lease area, preference is given to endemic species and mixed culture plantation. The species will be selected carefully from the following groups for quick reclamation:

- Nitrogen fixing tree species for fuel wood, timber and fodder.
- Fruit bearing tree species.
- Tree species with dense foliage for shade.
- Flowering and ornamental tree species.
- Native species.

The list of the species recommended for afforestation on the overburden and other vacant areas is as given below:

Botanical Name	***Local /Trade Name***	***Mitigation value***
Acacia ariculiformis	Babool	Dust pollution
Albizialebeck	Sirish	Dust pollution



Land Use As Per Approved Plan		Proposed Land Use After Reclamation	
Particulars	**Area (Ha)**	**Particulars**	**Area (Ha)**
Quarry	425.22	Backfilled Area Reclaimed With Plantation	178
		Void/ Haul roads left over for future use	247.22
External Dump	89.16	Reclaimed with plantation	89.16
Industrial Area	60.75	Industrial area for future use	60.75
Safety Zone/green belt	28.92	Plantation on Safety Zone/ Green Belt	26.12
		Land for Future Use	2.8
Embankment/Garland Drain/Diversion of Public Road/Nala Diversion	15.82	Land for public Use	15.82
Total	**619.87**	**Total**	**619.87**

LEGENDS

SL. No.	PARTICULARS	SYMBOL
01	BORE HOLE	
02	QUARRY BOUNDARY	
03	FLOOR CONTOUR	
04	SURFACE CONTOUR	
05	RIVER / NALA	
06	PROJECT BOUNDARY	
07	RAILWAY LINE	
08	ROAD	
08	Plantation on OB Dump	

ALL DIMENSIONS ARE IN METERS

Plate XV

Customer: CENTRAL COALFIELDS LIMITED

Job Title: AMRAPALI EXPANSION OCP (PHASE-I) — Job No.

Subject: POST MINING LANDUSE PLAN

Activity	Name	Designation	Signature	Date
Created				
Created	P K SINHA	Chief, R.I.-III		15-05-2013
Checked	J.DHAVAMANY	AGM (OC)		15-05-2013
Approved	Dr. K.B.Ne	HoD, R.I.-III		15-05-2013

CMPDI, R.I.-III
A MINI RATNA COMPANY

Scale: 1 : 10000 — Sheet

Drg.No. CMI CPM 00132VB — Rev.No.

Madhucalatifolia	Mahua Tree	Dust pollution
Aeglemarmelos	Bael tree	Dust pollution
Syzygiumcumini	Amrud	Dust pollution
Cassia fistula	Golden shower	Dust pollution
Ailanthusexcelsa	Maharukha	Dust pollution
Buteamonosperma	Flame of the Forest	Dust pollution
Dalbergiasisoo	Indian Rose wood	Dust pollution
Dendrocalamusstrictus	Hard bamboo	Wind barrier
Bambusaaurundinacea	Hallow bamboo	Wind barrier
Ficusbenghalensis	Banayan Tree	Soil erosion
Ficusreligiosa	Peepal Tree	Soil erosion
Azadirachtaindica	Neem tree	Soil erosion
Meliaazaderach	Bakneem	Soil erosion
Terminaliaarjuna	Arjun	Soil erosion
Terminaliatomentosa	Saj	Noise barrier
Ailanthus excelsa	Mahurkha	Noise barrier
Tectonagrandis	Teak wood	Noise barrier

3-tier plantation will be done all along the periphery of the colony for dust and noise attenuation. This will protect colony from air & noise pollution.

Year-wise Plantation Plan

Year	Green Belt& Safety Zone		Backfilled Area		Infrastructure		External Dump		Total		Cost to be incurred in Rs. Lakhs
	Area (Ha)	Trees (000)	Area (Ha)	Trees (000)	Area (Ha)	Trees (000)	Area (Ha)	Trees (000)	Area (Ha)	Trees (000)	
Plantation carried out till date	**1.50**	3.75	0.00	0.00	0.00	0.00	**5.00**	12.50	6.50	16.25	
Y1	17.42	43.55	0.00	0.00	0.00	0.00	6.00	15.00	23.42	58.55	81.97
Y2	7.20	18.00	0.00	0.00	0.00	0.00	10.16	25.40	17.36	43.40	60.76
Y3	0.00	0.00	40.00	100.00	0.00	0.00	10.00	25.00	50.00	125.00	175.00
Y4	0.00	0.00	30.00	75.00	0.00	0.00	10.00	25.00	40.00	100.00	140.00
Post Closure Y5	0.00	0.00	35.00	87.50	0.00	0.00	12.00	30.00	47.00	117.50	164.50
Post Closure Y6	0.00	0.00	35.00	87.50	0.00	0.00	12.00	30.00	47.00	117.50	164.50
Post Closure Y7	0.00	0.00	38.00	95.00	0.00	0.00	12.00	30.00	50.00	125.00	175.00
Total	**26.12**	**65.30**	**178.00**	**445.00**	**0.00**	**0.00**	**77.16**	**192.90**	**281.28**	**703.20**	**961.73**

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Topsoil Management

Till date, around 2.5 Lakh m^3 of top soil has been stocked at a separate top soil dump on the eastern quarry. Further it has been estimated that around 23 Lakh m^3 of top soil to be generated thorugh out the life of mine. This top soil will be used for concurrent technical and biological reclamation of OB dumps.

1.1.2 Impact on Biological Environment – Core Zone

The mining activity results in habitat loss of the local faunal species. The existing flora may also get affected due to industrial activity and fugitive dust emissions. However, as the Amrapali Expansion OCP (Phase-I) is proposed within the same project boundary of existing Amrapali opencast project (14.4 MTPA), the impact on flora and fauna due to expansion is not significant.

The floristic component of the core area does not include any rare or endangered species. The core zone of the study area has majorly Sal dominating patches along with mixed forest species as stated above. The plantation in mine lease area has vegetation composition of Gulmohar, Auriculiformis, Kadam, anwla, Alstonia scholaris, cassia siamea, bamboo, Jakranda, jamun, Karanj, Mahogany, Siris, Neem, mango, Jackfruit, Peltaforum etc.

From the basleline Flora & Fauna Study, it is observed that there is no endangered and endemic species found in the core zone area as per Red Book of Botanical Survey and Zoological survey of India as per Wild Life (Protection) Act 1972 and its subsequent amendments.

Mitigative measures:

- Monitoring of the area on regular intervals.
- Management of OBDs appropriately. Selection of plant for forestation on the OB dumps and the periphery should be of mixed type having a combination of fast and slow growing species with an ultimate aim to have triple storey plantation i.e. a combination of species of tall, intermediate and short height plant may be planted all round the dump. At the top of OB dump slow and short height plant should be planted while at the foot, fast growing and long height plants should be planted. This will break the blowing of wind and prevent the dust from being air born.
- Greening of peripheral areas will be done. There is need for creating green belt of at least 30-40 meters width to provide an effective dust, noise and sight curtain in the periphery of mining area. The trees to be planted in the green belt area shall act as buffers and shock absorber against dust, noise and stone flying. Trees in the green belt should be tall, wind firm, broad leaved and evergreen.
- A green belt of 20-30 mts wide in triple storey fashion should be raised on either side of the haul road to prevent migration of dust and noise far off places. Besides, along the link road, access road, colony road, 3-4 rows of evergreen and dust resistant plants should be raised in triple storey fashion.
- With the help of the local people and employees watch will be kept on hunting/killing of these animals. Forest and police department will be informed if such incident happens to take action against the offenders. If necessary help of forest department will be taken to shift any such stranded animals to a safer place.

- Awareness measures about preservation of wild life and biodiversity in neighborhood villages will be brought through painted signboards and slogans etc. Awareness programmes in local schools will be arranged every year during Environment week, Wild life week and Van Mahotsava.

1.2 Buffer Zone

1.2.1 Impact on Agriculture – Buffer Zone

As per the remote sensing based land use map of the Buffer Zone of Amrapali Epansion OCP (Phase-I), the agricultural land is around **12808 Ha** which comes around to be approximately 29 % of the total buffer zone area**.**

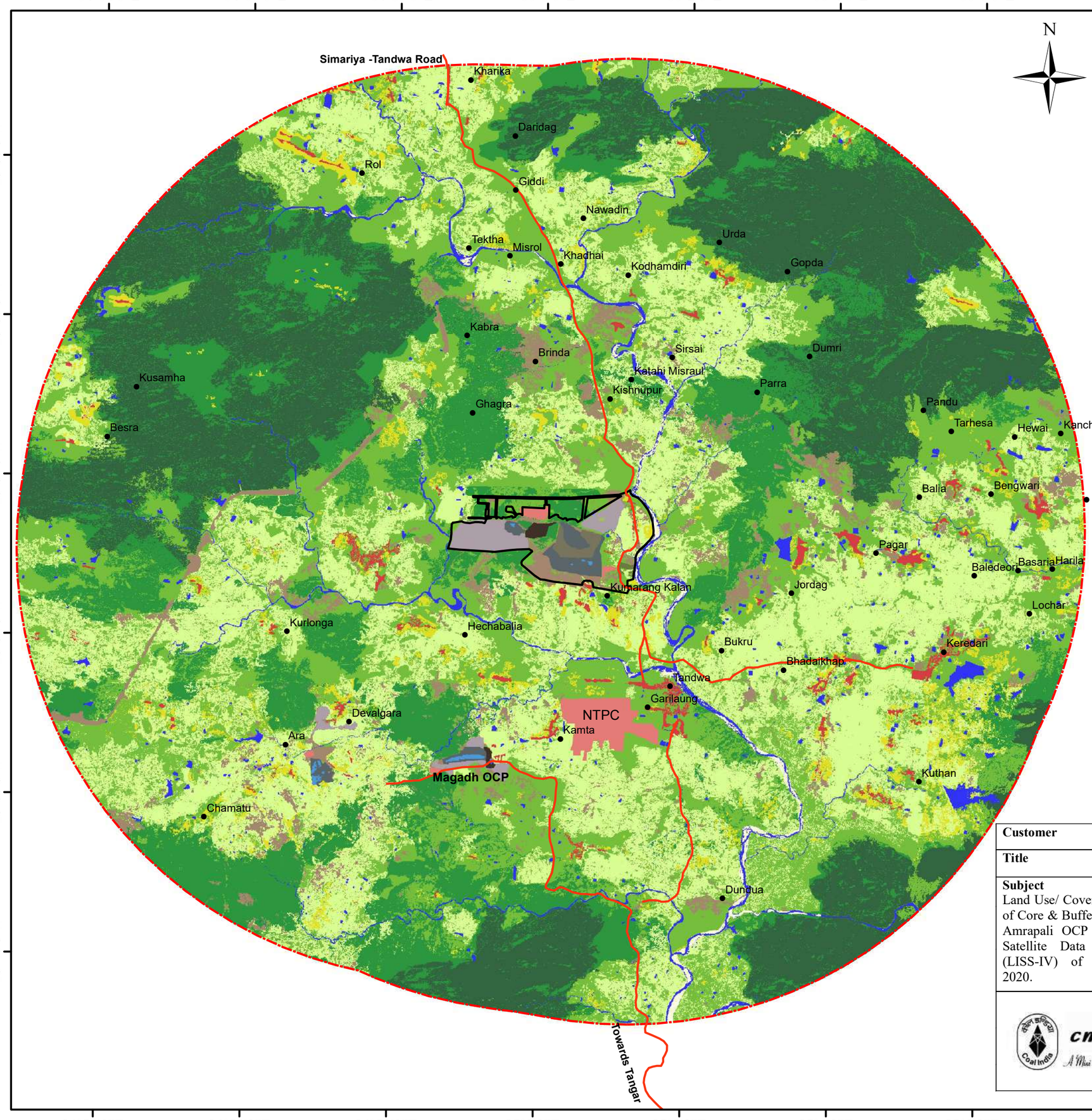
S.No.	Class	Area (Ha)	% of Total Buffer Zone
01.	Agriculture Land – Crop Land	1173.0	2.65
02.	Agricultuire land – Fallow Land	11635.0	26.30
	Agriculture land –Total	**12808.0**	**28.95**

Dust generated due to mining and allied activities may have an impact on agriculture land in the buffer zone .

As per Air Quality Impact Assessment carried out in EIA-EMP of Amrapali Expansion OCP (phase-I), incremental concentration of PM10 (>10 ug/m3) has been observed in the downwind region of buffer zone.

24 Hours average PM_{10} concentration (µg/ m3)								
Station	**Baseline Conc.**	**Incremental PM_{10} Without Control Measures**	**Incremental PM_{10} With Existing Control Measures**	**Incremental PM_{10} With Additional Control Measures**	**Total Predicted Conc. Without Control Measures**	**Total Predicted Conc. With Existing Control Measures**	**Total Predicted Conc. With additional Control Measures**	**Permissible Limits**
	1	**2**	**3**	**4**	**(5)= (1)+(2)**	**(6)= (1)+(3)**	**(7)= (1)+(4)**	
Honhe Village	76.00	180.43	54.10	**15.3**	256.43	130.10	**91.3**	**100**
Pachra	69.00	240.02	78.10	**27.0**	309.02	147.10	**96.0**	**100**
Ursu	69.54	212.26	69.61	**26.0**	281.80	139.15	**95.5**	**100**
Tandwa	77.08	89.48	28.82	**13.1**	166.56	105.90	**90.2**	**100**
Bukuru	62.54	90.30	30.67	**14.2**	152.84	93.21	**76.8**	**100**

Agricultural land around the Honhe, Pachra, Ursu, Tandwa, Bukuru Villages are likely to be affected due to the observed incremental concentration of PM10 dust particles.



Area Statistics - Core & Buffer zone of Amrapali OC

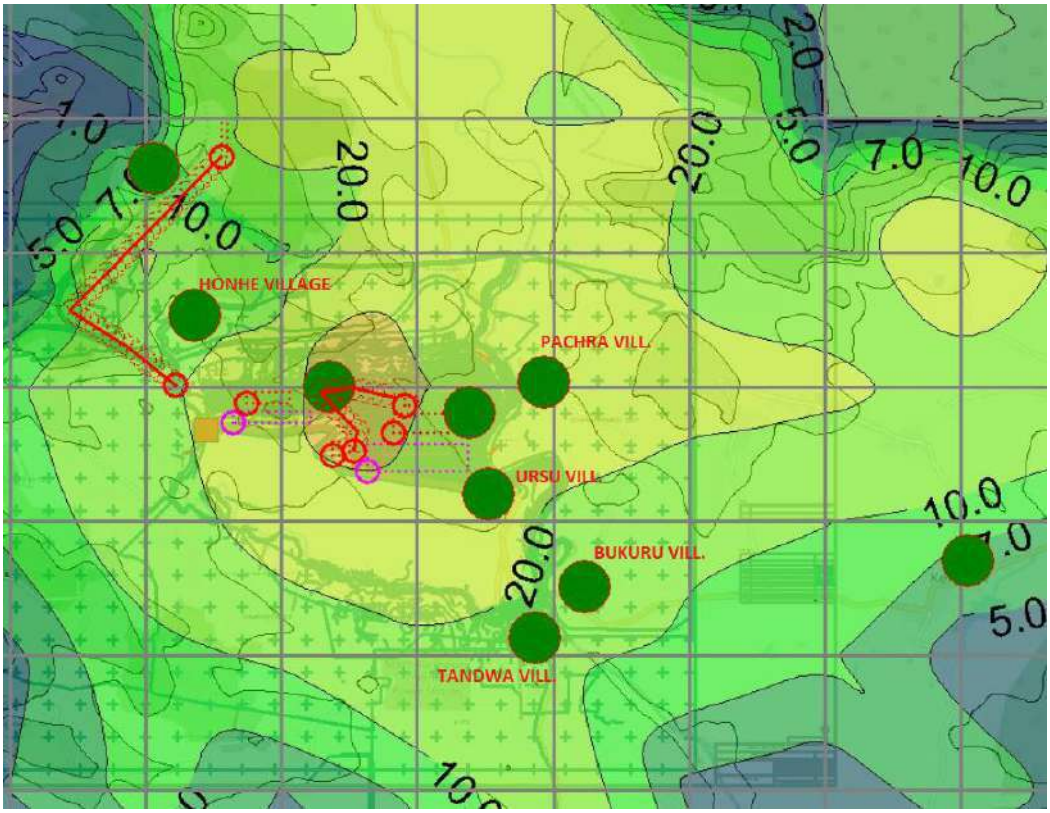
Classes		Colour	Core Zone		Buffer Zone	
Level-I	Level-II		Area (Km^2)	% of Total	Area (Km^2)	% of Total
Forest	Dense Forest		0.00	0.00	84.52	19.10
	Open Forest		0.30	4.84	73.42	16.59
	Total Forest		**0.30**	**4.84**	**157.94**	**35.69**
Scrubs	**Scrubs**		**0.88**	**14.19**	**122.50**	**27.69**
Plantation Area	Social Forestry		0.07	1.13	0.07	0.02
	Plantation on OB		0.01	0.16	0.01	0.00
	Plantation on Backfill		0.00	0.00	0.00	0.00
	Total Plantation Area		**0.08**	**1.29**	**0.08**	**0.02**
Agriculture Land	Crop Land		0.09	1.46	11.73	2.65
	Fallow Land		0.64	10.32	116.35	26.30
	Total Agriculture Land		**0.73**	**11.78**	**128.08**	**28.95**
Waste Land	Waste Land		1.03	16.61	14.20	3.21
	Sand Body		0.02	0.32	1.50	0.34
	Fly Ash Pond		0.00	0.00	0.00	0.00
	Total Waste Land		**1.05**	**16.93**	**15.70**	**3.55**
Mining Area	Coal Quarry		0.87	14.04	1.22	0.28
	Barren OB Dump		1.42	22.90	2.02	0.46
	Back Fill		0.41	6.61	0.41	0.09
	Coal Dump		0.16	2.58	0.23	0.05
	Water Filled Quarry		0.02	0.32	0.16	0.04
	Total Mining Area		**2.88**	**46.45**	**4.04**	**0.92**
Settlements	Urban Settlements		0.00	0.00	0.00	0.00
	Rural Settlements		0.05	0.81	3.58	0.81
	Industrial Settlements		0.20	3.23	2.21	0.49
	Total Settlement Area		**0.25**	**4.04**	**5.79**	**1.30**
Water Body	**River/ Ponds**		**0.03**	**0.48**	**8.34**	**1.88**
	Total Area		**6.20**	**100.00**	**442.47**	**100.00**

Index

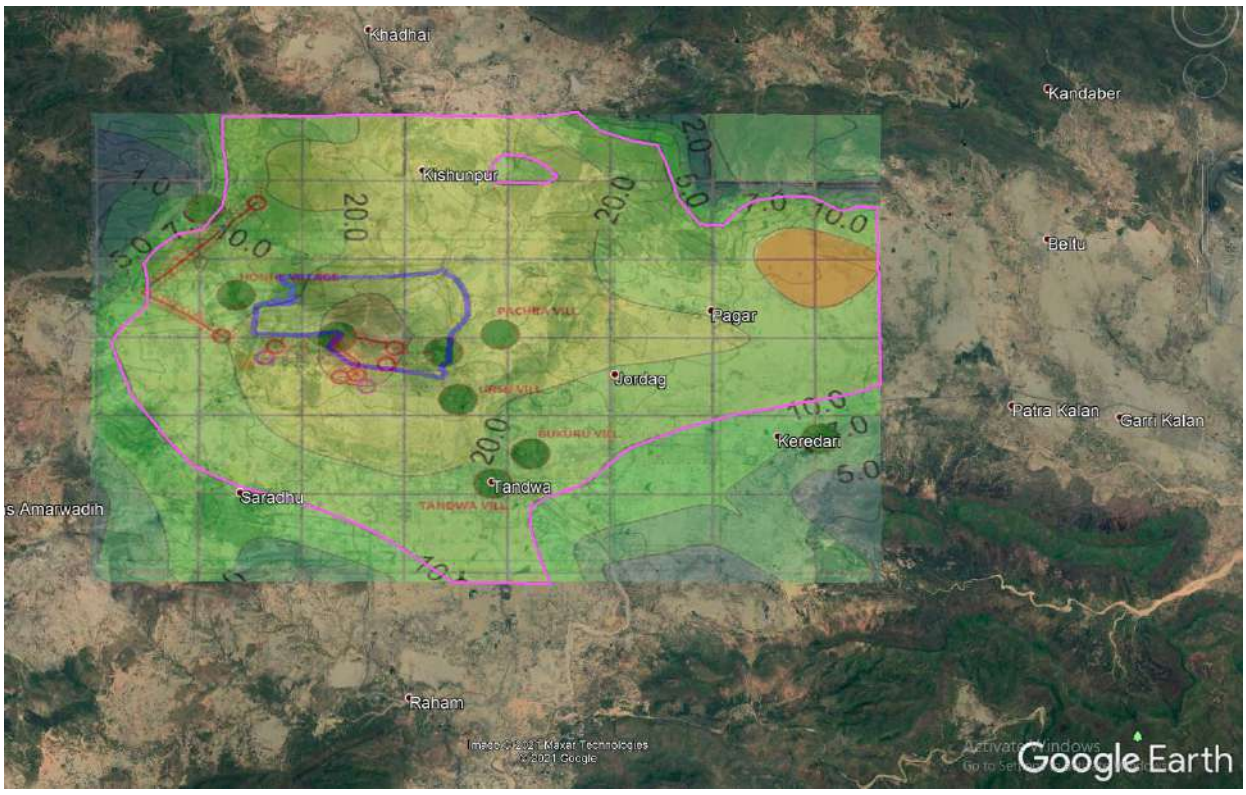
Core Boundary — Road

Buffer Boundary — Settlement

Customer	Central Coalfields Limited				
Title	Land Use/ Cover Mapping of Core & Buffer Zones				Job No: 3119115
Subject Land Use/ Cover Mapping of Core & Buffer Zones of Amrapali OCP based on Satellite Data IRS R2 (LISS-IV) of the year 2020.	Activity	Name	Designation	Signature	Date
	Prepared	P. Bhatta	Deputy Manager (Geomatics)		
	Checked	Hariharlal. B	Sr. Manager (Geomatics)		
cmpdi A Mini Ratna Company	Approved	Rajneesh Kumar	GM (Geomatics)		
	Scale: 3 1.5 0 3 Km				Sheet: 1
	Drg No: HQ REM A3 20 12				Rev : 0



The total buffer zone area falling under the impact zone (where the incremental PM10 concentration is more than or equal to 10 ug/m3) is approximately **11,430 Ha**.



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Observations

The impact zone of the buffer area (6021.6 Ha) has been calculated by superimposing the PM10 isopleth, obtained from the AQIP, over the Amrapali Expansion OCP (Phase-I) project boundary. The impact area has been computed by considereing the >10ug/m3 isoplethe in Google Earth.

Considering approx. 29 % agricultural area in the probable impact zone. The total agriculture area falling under impact zone comes around **3314.7 ha**. However, the overall concentration of the particulate matter (PM10) is within the prescribed standard as per NAAQS 2009.

Mitigative Measures for dust control:

- Existing coal transportation road will be converted into PCC road.
- 3 tier avenue plantation will be developed all along the coal transportation road.
- Fixed sprinkling system at critical sections of Coal tranportation road
- 2 no. of road sweeping machines will be deployed to remove dust on roads.
- Vehicle wheel washing systems will be installed on both ends of the coal transportation road.
- Wind Barriers will be installed at certain sections of CTR in order to contain the impact of coal transportation on nearby settlement

1.2.2 Impact on Biological Environment – Buffer Zone

During the biological assessment, as mentioned in Chapter 2, 13 species of terrestrial fauna, 10 species of amphibians,14 species of reptiles, 32 species of Avifauna ,8 species of fishes, 12 species of invertebrates and 11 species of mammals were reported. From the baseline Flora Fauna Study, it is observed that there are no endangered and endemic species found in the core zone area as per Wild Life (Protection) Act 1972 and its subsequent amendments.

In the Buffer zone, as per the interaction with local stakeholders and reference of forest working plan, Peacock and Python of Schedule I species are occasionally sighted.

S.No.	Category	Faunal Species	Common Name	Schedule as per WPA, 1972	Location
01.	Avifauna	Pavo cristatus	Peafowl	Schedule-I	Buffer Zone
02.	Reptile	Python Molurus	Python	Schedule-I	Buffer Zone

1.3 Conservation Plan for Peafowl

1.3.1 General Description

Peacock or Indian peafowl (Pavo cristatus) is a familiar and universally known large pheasant. It is a National Bird of India, belongs to Schedule I (part III) of

the Wildlife (Protection) Act 1972 was present in both, village and forest areas of the study area. (as per secondary source Interview from the local people)

The male has a spectacular glossy green long tail feathers that may be more than 60 percent of the bird's total body length. These feathers have blue, golden green and copper colored ocelli (eyes). The long tail feathers are used for mating rituals like courtship displays. The feathers are arched into a magnificent fan shaped form across the back of the bird and almost touching the found on both sides. Females do not have these graceful tail feathers. They have the fan like crest with whitish face and throat, chestnut brown crown and hind neck, metallic green upper breast and mantle, white belly and brown back rump and tail. Their primaries are dark brown.

Kingdom	Animalia
Phylum	Chordata
Class	Aves
Order	Galliformes
Family	Phasianidae
Genus	Pavo
Species	*Pavo cristatus*
Vernacular name	Indian Peafowl
Conservation status	
IUCN	Least concern (IUCN- 3.1)
IWPA	Schedule I

1.3.2 **Life Cycle**

Call	Kee-ow, Kee-ow, Kee-ow, Ka-an, Ka-an, Ka-an, Kok-kok, Kok-kok, cain- kok
Breeding	April-September
(Project area) Nest site	On ground in undergrowth (wild) On buildings by semi-feral birds in villages
Body length	180-230 cm
Weight	2750-6000 gm

==========

Habitat	In the undergrowth in deciduous forests near streams Tall trees for roosting

1.3.3 **Food habits**

Peafowls are omnivores, eating plant parts, flower petals, seed heads, insects and other arthropods, reptiles and amphibians. In the study area, dense tree canopy cover supports good insect diversity which is very common food for peafowl.

1.3.4 **Conservation Status**

The Indian Peafowl is classified as LeastConcernon the IUCN Red List of Threatened Species (3.1).

1.3.5 **Common Threats**

Threats to the peacocks in the area are:

1) Habitat loss, specially the shortage of tall trees in and around the villages for roosting and for providing shade during hot summer months.
2) Shortage of drinking water for the birds during the hot summer days.

3) Casualties caused by eating chemically treated agricultural crop seeds.

4) Illegal hunting by some poachers.

In the study area, all the villages surveyed are against hunting or poaching of the people. Peacock conservation plan has to address these threats.

1.3.6 **Conservation Measures**

Direct and indirect approach is required to provide effective conservation, which is recommended as under:

1. Increasing the tree cover in the buffer area for shelter and roosting of peacocks. This will be achieved by planting of tree groves (a group of trees that grow close together, generally without many bushes or other plants) in buffer area. Some local species such as Neem, Siris, Ashok, Amaltash, Ardu, Shesham, Peepal tree etc. will be planted. Planting of tree groves in school compounds in the villages of buffers area will be planted as per the plantation programme.

2. By conducting awareness programmes (community and school level) for conservation of peacocks in the area and also through organizing competitions during "Wildlife Week" and "Van Mahotsave" celebrations.

3. Some provision of rewards to informers for the control of poaching and illegal trade in wildlife.

4. Carrying out census and research projects to know the potential threats and population status of the species.

5. Provision of veterinary care and cages for injured or sick deformed birds.

6. Suggest strategies to minimize negative impacts of changing environment in nearby area of peacock populations and to promote conservation of peacock habitats.

1.4 Conservation Plan for Python

1.4.1 **General Description**

Scientific Name :*Python molurus*

LocalName : Ajgar

Kingdom	Animalia
Phylum	Chordata
Class	Reptilia
Order	Squamata
Family	Pythonidae
Genus	Python
Species	*molurus*
Vernacular name	Indian Rock Python
Conservation status	
IUCN	Near Threatened
IWPA	Schedule I

1.4.2 **Distribution and Habitat**

P.molurus occursin India,southern Nepal, Pakistan, Sri.Lanka, Bhutan, Bangl adesh, and probably in the north of Myanmar. It lives in a wide range of habitats, including grasslands, swamps, marshes, rocky foothills,

woodlands, open forest, and river valleys. It is a good climber and sometime suspends itself from the branches of trees, waiting motionless for a prey to come within its easy reach. It is extremely fond of water and is an expert swimmer.

It hides in abandoned mammal burrows, hollow trees, dense water reeds, and mangrove thickets.

1.4.3 **Behaviour**

Lethargic and slow moving even in their native habitat, they exhibit timidity and rarely try to attack even when attacked. Locomotion is usually with the body moving in a straight line, by "walking on its ribs". They are excellent swimmers and are quite at home in water. They can be wholly submerged in water for many minutes if necessary, but usually prefer to remain near the bank. Like all other species of reptiles it is cold blooded by nature and as such it hibernates into hollows of trees, underneath rocks or rock-shelves. The species is more nocturnal thandiurnal.

1.4.4 **Food**

Indian pythons are strict carnivores and feed on mammals, birds, and reptiles indiscriminately, but seem to prefer mammals. The python can swallow prey bigger than its diameter because the jaw bones are not connected. Moreover, prey cannot escape from its mouth because of the arrangement of the teeth (which are reverse saw-like).

1.4.5 **Conservation Status**

The Indian python is classified as lower risk/near threatened on the IUCN Red List of Threatened Species (v2.3, 1996). This listing indicates that it may become threatened with extinction and isin need of frequent reassessment.

1.4.6 **Common Threats**

i. Pythons are killed for their valuable skin for commercial use.
ii. The Indian python is classified as lower risk/near threatened due to the gradual loss of their habitat and overexploitation by man.
iii. Fear from death due to snake bites make them vulnerable to human kill.

1.4.7 **Conservation issues**

In general the reptilian fauna of India is on decline due to various factors including environment apathy, habitat loss, forest fire and ignorance of the

common people towards them and their over exploitation for commercial uses; besides, non-implementation of the conservation measure is also important. Snakes don't get much legal protection because of the public prejudice.

1.5 Public Awareness Programmes for Protection and Conservation

Among all the threats of biodiversity, lack of awareness is the major cause for their loss. Hence, public awareness programmes will be conducted regarding the issues, conflicts and facts of wildlife, especially for the entire Schedule-I species present in the buffer zone. Any kind of illegal collection or poaching noted in the study area will be immediately informed to the concerned authority. Conservation education and public awareness are useful tools in changing the behaviour of people. Awareness programmes about various wildlife species, their ecology, habitat, food & feeding and behaviour will be conducted in the Buffer Zone. Programmes will target to make aware all groups (Community Forest User Group,Women's groups, Villagers of the Buffer Zone, School Teachers and Students).

Moreover, workers will be trained and educated about the importance of the entire wild animal for ecology and ultimately to humans. For awareness sign boards will also be placed in the buffer zone with slogans.

Functions like Van Mahotsav, WildlifeWeek, World Forestry Day, and World Environment Day will be organized in a befitting manner in which village heads and other members of gram Panchayat, local leaders and members of regional NGO will also be invited.

Another major threat is habitat loss to Schedule-I species which often leads to human-animal conflict. It will include the formal training on the importance of biodiversity and also to make available the information of the flora and fauna of high conservation value present in the surrounding areas. Information on Wildlife policies and Government regulation and penalties will be provided to workers.

The conservation plan will focus towards enrichment and development of composite habitat for Schedule-I species. This will be achieved by revegetation of degraded forest area/block in the buffer zone and eco-restoration/reclamation of mined out areas keeping in view the creation of alternate habitat for Schedule-I species. Engagement of scientific agencies/bodies will be done towards this purpose.

Chapter 2
Financial Provisions

2.1 Land Reclamation & Green Belt Development

In the EIA-EMP study of Amrapali Expansion OCP (Phase-I), it has been proposed to carry out land reclamation and enrichment through plantation to convert the area as a composite faunal habitat.

S.No.	Proposed Plantation location	Area (Ha)	No. of Tress (000)	Cost (in Rs. Lakh)
01	Green-Belt & Safety Zone	24.62	61.55	86.17
02	Backfilled Area	178.00	445.00	623.0
03	External Dump	72.16	180.4	252.56
Total		**274.78**	**686.95**	**961.37**

2.2 Proposed Capital Cost for Conservation Plan of Scheduled-I Species

S.No	Activity	Amount (in Rs. Lakhs)
1	**Construction and enrichment of habitat**	**898.00**
a	Eco-restoration of mined out area as alternate habitat for Schedule-I Species	873.00
b	Revegetation Cost of degraded forest area/block	25.00 (Approx.)
2	**Construction of water holes/bodies**	**1000.00**
3	**Protection from fire**	**2183.00**
4	**Engagement of scientific agencies/bodies for eco restoration for creating alternative habitat for schedule-I species**	**150 .00**
5	**Training and awareness programme**	**5.00 (Approx.)**
	Total	**4236.00**

ENCLOSURE 10

Comprehensive Plan for supplying/distribution with piped water to the nearby habitation in villages/ settlements

Providing potable drinking water to the villagers is one of the major CSR activities.. The year wise expenditure for CCL for providing drinking water to PAPs, inhabitants, villagers etc. of CCL command areas are given below:

SN	Sector	Year	Expenditure in Rs Lakhs
1	Drinking Water	2019-20	572.91
2		2018-19	342.95
3		2017-18	215.22

The aforesaid expenditure has incurred for Installation of hand pumps, Construction of wells, Deep Boring and Submersible pumps, Water Pipeline distribution and Distribution of water through water tankers.

For provisions of treated drinking water the following measures has been taken for Magadh & Amrapali Area & nearby projects under CSR:

SN	Year	CSR Project	Location	Amount spent on projects (in Rs Lakhs)
1	2019-20	34 numbers of Solar powered Deep Bore Well & submersible pump for drinking water supply	In the villages coming within 25 KM radius of operational units (M&A & Piparwar) in the district of Chatra & Latehar of Jharkhand.	352.28
2	2018-19	Provision of drinking water through tankers	In the villages coming within 25 KM radius of operational units of M&A Area in the district Chatra of Jharkhand	86.32
3	2017-18	Provision of drinking water through tankers		36.31

The photographs depicting the said activities are given below:

Future Plan for distribution with treated water to nearby villages:

1. In FY 2020-21 it is proposed to undertake the following activities at Amrapali Area for supply of drinking water:

SN	Year	CSR Project	Approximate Cost (in Rs Lakhs)
1	2020-21	Construction of Solar Power Operated deep borewell with recharge Pit	65
2		Construction of Ponds in Project Affected villages	30

2. Around 260 PAFs have been identified in the villages Binglat and Manwatongri Tola (Tola of Kumrangkala) falling within the project boundary for resettlement. An R&R site has been identified near Serendag village in 36 Ha that will be developed with all facilities including treated, piped facility for drinking water for each family.
3. It is further proposed that Laying of pipeline/ infrastructure for clean water supply to other identified communities/villages shall be undertaken by FY 2021-21 by Rs. 30 Lakhs

ENCLOSURE 11

S.No 12: PP should submit the quantity of surface or ground water to be used for this project. The complete water balance cycle need to be submitted. In addition to this PP should submit a detailed plan for rainwater harvesting measures to be taken.

Water Demand

Mine requires water for domestic & industrial (i.e. Land reclamation, workshop, dust suppression, greenbelt development and fire fighting) uses. The peak industrial water demand for Amrapali Expansion OCP was projected as 1842.75 cum/day. The domestic water demand (colony + industrial buildings) was projected as 437 cum/day. Thus, the total water requirement is 2280 cum/day. The details of peak water demand of the project are as given below.

Table: Peak Industrial and Domestic Water Demand

Purpose	Peak Demand (m^3/day)
A. Mine site	**Amrapali OCP**
Land reclamation at dump site	112.00
Haul Road Watering	540.00
Drinking at Project site	50.00
Green belt development	8.00
Dust Suppression in Coal transportation road & other Industrial premise	330.00
Workshop (HEMM washing, Floor washing & others)	65.00
Fire service	650.00
Process & Others losses	87.75
Sub-total (A)	1842.75
Township	
Gardening and Green belt development	36.38
Domestic	363.83
3.Other (Service Building like GM office, Guest house, Hospital, Club, School etc))	36.38
Sub-total (B)	437.00
Grand Total (A+B)	**2280.00**

Refer **Plate XII** for Proposed water usage diagram of Amrapali Expansion OCP

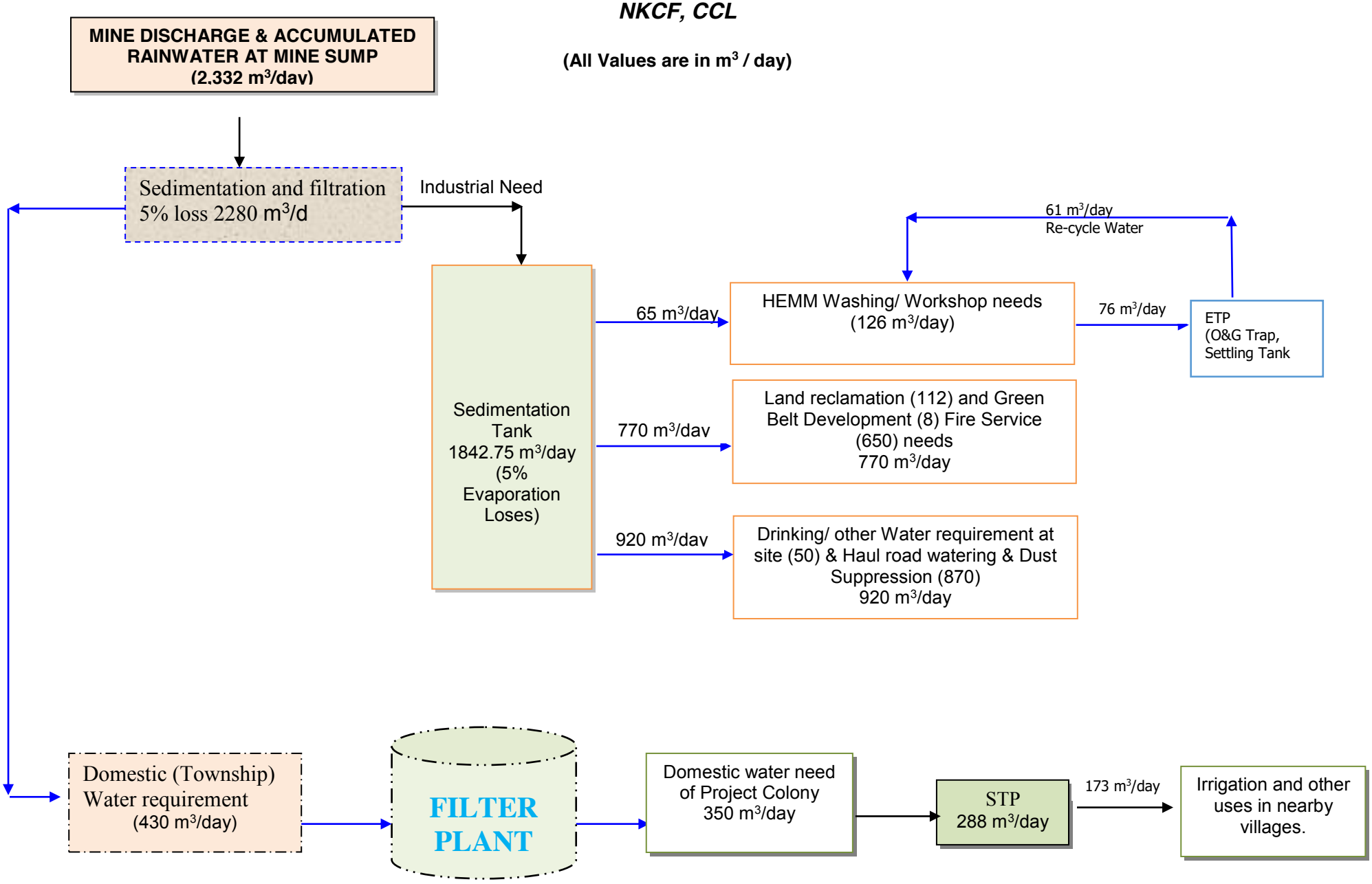
The domestic and industrial water demand of proposed project will be fulfilled by the mine discharge and rain water stored in the sump.

Rain Water Harvesting Measures

Existing	Proposed
• Rain water harvesting system has been provided on different office buildings of Amrapali OCP. • One no. check dam at Dhudhmatia nallah near Binglat OB dump has been constructed for the ground water	• Further 2 no. of check dams have been proposed on Honhe nala and 4 no. of checkdams on Binglat nala for artificial ground water recharge. • Additional 14 no. of Roof Top Rain water

recharge and to prevent the siltation. • 4 no. of ponds were constructed in villages Hone, Ursu, Koed and Tileadih. • A Piezometer has been installed at Amrapali to check the level of ground water	Harvesting Structures have been proposed at different locations of Amrapali OCP • Additional 05 no. of Piezometers have been proposed to monitor the ground water level. • Embankment will be provided along the Barki river and green belt will be developed. • Surface drainages with settling ponds will be provided all along the coal transportation road to prevent the contamination of surface water by coal dust.

PLATE XII: PROPOSED WATER USAGE DIAGRAM OF AMRAPALI EXPANSION OCP, MAGADH-AMRAPALI AREA, NKCF, CCL



PROPOSED ROOFTOP RAINWATER HARVESTING STRUCTURES DETAILS

Sl No.	Location	Building Type	Status	No. of Buildings	Total Area (sqm)	Latitude	Longitude	Quantity (m^3/annum)	Cost in Rs. Lakhs
1	Project office Honhey	Permanent	Completed	1	353	23.67093	85.02361	216.97	-
2	Canteen building at P.O Office campus Honhey	Permanent	Completed	1	35	23.67094	85.02362	21.51	-
3	Toilet Building at P.O Office campus Honhey	Permanent	Completed	1	25	23.67093	85.02361	15.37	-
4	Home Guard Barrack at P.O Office campus Honhey	Temporary	Completed	1	180	23.67093	85.02361	110.64	-
5	Executive Hostel	Temporary	Completed	1	492	23.89323	84.99849	302.4	-
6	V.T.C Building Honhey	Permanent	Proposed	1	360	23.89304	84.98284	221.27	1.5
7	Unit Store Honhey	Temporary	Proposed	1	666	23.90018	84.97281	409.35	1.5
8	Staff Barrack	Temporary	Proposed	1	514	23.89323	84.99849	315.92	1.5
9	IRB Camp Building 1	Permanent	Proposed	1	106.25	23.89323	84.99849	65.31	1.5
10	IRB Camp Building 2	Permanent	Proposed	1	147.87	23.89323	84.99849	90.89	1.5
11	SISF Camp Building	Temporary	Proposed	3	540	23.89371	84.99829	331.91	4.5
12	V.T.C Room	Temporary	Proposed	2	360	23.89323	84.99849	221.27	3
13	Pit Canteen	Temporary	Proposed	1	63.16	23.89267	85.00402	38.82	1.5
14	Check post	Permanent	Proposed	2	24	23.86774	85.02448	14.75	3
15	First Aid	Permanent	Proposed	1	97.5	23.89267	85.00402	59.93	1.5
16	Rest Shelter	Permanent	Proposed	1	185.59	23.89507	85.00152	114.07	1.5
17	Check post	Temporary	Proposed	3	45	23.90018	84.97281	27.66	4.5
18	PIT Office	Temporary	Proposed	1	180	23.89267	85.00402	110.64	1.5
19	Weigh bridges 1, 5,6 to14	Permanent	Proposed	11	25.77	NA	NA	174.24	16.5
Total Proposed Cost				**35**	**4400.14**			**2862.92**	**45**

ENCLOSURE 12

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
और गंगा संरक्षण विभाग
केन्द्रीय भूमि जल प्राधिकरण
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Authority

(भूजल निकासी हेतु अनापत्ति प्रमाण पत्र)
NO OBJECTION CERTIFICATE (NOC) FOR GROUND WATER ABSTRACTION

Project Name:	Amrapali Ocp (12.0 Mty) Of M/s Central Coalfields Limited		
Project Address:	Office Of The Project Officer, Amrapali Ocp, Magadh And Amrapali Area		
Village:	Ursu	Block:	Tandwa
District:	Chatra	State:	Jharkhand
Pin Code:			
Communication Address:	Project Officer, Amrapali Ocp, Office Of General Manager, Magadh-amrapali Area,, Central Coalfields Ltd, Tandwa, Chatra, Jharkhand - 825321		
Address of CGWB Regional Office :	Central Ground Water Board Mid Eastern Region, 6th & 7th Floor, Lok Nayak Jai Prakash Bhawan, Frazer Road Dak Banglow, Patna, Bihar - 800011		

1.	**NOC No.:**	CGWA/NOC/MIN/ORIG/2021/10718			
2.	Application No.:	21-4/328/JH/MIN/2018	3.	Category: (GWRE 2017)	Safe
4.	Project Status:	Existing Project	5.	NOC Type:	New
6.	**Valid from:**	05/02/2021	7.	**Valid up to:**	04/02/2023

8. Ground Water Abstraction Permitted:

Fresh Water		Saline Water		Dewatering		Total	
m³/day	m³/year	m³/day	m³/year	m³/day	m³/year	m³/day	m³/year
0.00	0.00			4220.00	1540300.00		

9. Details of ground water abstraction /Dewatering structures

	Total Existing No.:0						**Total Proposed No.:0**					
	DW	DCB	BW	TW	MP	MPu	DW	DCB	BW	TW	MP	MPu
Dewatering Structure*	0	0	0	0	0	4	0	0	0	0	0	0

*DW- Dug Well; DCB-Dug-cum-Bore Well; BW-Bore Well; TW-Tube Well; MP-Mine Pit;MPu-Mine Pumps

10. Ground Water Abstraction/Restoration Charges paid (Rs.): 7701500.00

11.	Number of Piezometers(Observation wells) to be constructed/ monitored & Monitoring mechanism.	No. of Piezometers	Monitoring Mechanism		
			Manual	DWLR**	DWLR With Telemetry
	**DWLR - Digital Water Level Recorder	2	0	1	1

(Compliance Conditions given overleaf)

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18/11, जामनगर हाउस, मानसिंह रोड, नई दिल्ली - 110011 / 18/11, Jamnagar House, Mansingh Road, New Delhi-110011
Phone: (011) 23383561 Fax: 23382051, 23386743
Website: cgwa-noc.gov.in

Validity of this NOC shall be subject to compliance of the following conditions:

Mandatory conditions:

1) Installation of digital water flow meter (conforming to BIS/ IS standards) having telemetry system in the abstraction structure(s) shall be mandatory for all users seeking No Objection Certificate and intimation regarding their installation shall be communicated to the CGWA within 30 days of grant of No Objection Certificate through the web-portal.

2) Proponents shall mandatorily get water flow meter calibrated from an authorized agency once in a year.

3) Construction of purpose-built observation wells (piezometers) for ground water level monitoring shall be mandatory as per Section 14 of Guidelines . Water level data shall be made available to CGWA through web portal. Detailed guidelines for construction of piezometers are given in Annexure-II.

4) Proponents shall monitor quality of ground water from the abstraction structure(s) once in a year. Water samples from bore wells/ tube wells / dug wells shall be collected during April/May every year and analysed in NABL accredited laboratories for basic parameters (cations and anions), heavy metals, pesticides/ organic compounds etc. Water quality data shall be made available to CGWA through the web portal.

5) In case of mining projects, additional key wells shall be established in consultation with the Regional Director, CGWB for ground water level monitoring four (4) times a year (January, May, August and November) in core as well as buffer zones of the mine.

6) In case of mining project the firm shall submit water quality report of mine discharge/ seepage from Govt. approved/ NABL accredited lab.

7) The firm shall report compliance of the NOC conditions online in the website (www.cgwa-noc.gov.in) within one year from the date of issue of this NOC.

8) The firm shall submit the water audit report in case of water requirement is in excess of 100 m3/day through certified auditors within three months of completion of the same to CGWA.

9) Application for renewal can be submitted online from 90 days before the expiry of NOC. Ground water withdrawal, if any, after expiry of NOC shall be illegal & liable for legal action as per provisions of Environment (Protection) Act, 1986.

10) This NOC is subject to prevailing Central/State Government rules/laws/norms or Court orders related to construction of tube well/ground water abstraction structure / recharge or conservation structure/discharge of effluents or any such matter as applicable.

General conditions:

11) No additional ground water abstraction and/or de-watering structures shall be constructed for this purpose without prior approval of the Central Ground Water Authority (CGWA).

12) The proponent shall seek prior permission from CGWA for any increase in quantum of groundwater abstraction (more than that permitted in NOC for specific period).

13) Proponents shall install roof top rain water harvesting in the premise as per the existing building bye laws in the premise.

14) The project proponent shall take all necessary measures to prevent contamination of ground water in the premises failing which the firm shall be responsible for any consequences arising thereupon.

15) In case of industries that are likely to contaminate the ground water, no recharge measures shall be taken up by the firm inside the plant premises. The runoff generated from the rooftop shall be stored and put to beneficial use by the firm.

16) Wherever feasible, requirement of water for greenbelt (horticulture) shall be met from recycled / treated waste water.

17) Wherever the NOC is for abstraction of saline water and the existing wells (s) is /are yielding fresh water, the same shall be sealed and new tubewell(s) tapping saline water zone shall be constructed within 3 months of the issuance of NOC. The firm shall also ensure safe disposal of saline residue, if any.

18) Unexpected variations in inflow of ground water into the mine pit, if any, shall be reported to the concerned Regional Director, Central Ground Water Board.

19) In case of violation of any NOC conditions, the applicant shall be liable to pay the penalties as per Section 16 of Guidelines.

20) This NOC does not absolve the proponents of their obligation / requirement to obtain other statutory and administrative clearances from appropriate authorities.

21) The issue of this NOC does not imply that other statutory / administrative clearances shall be granted to the project by the concerned authorities. Such authorities would consider the project on merits and take decisions independently of the NOC.

22) In case of change of ownership, new owner of the industry will have to apply for incorporation of necessary changes in the No Objection Certificate with documentary proof within 60 days of taking over possession of the premises.

23) This NOC is being issued without any prejudice to the directions of the Hon'ble NGT/court orders in cases related to ground water or any other related matters.

(Non-compliance of the conditions mentioned above is likely to result in the cancellation of NOC and legal action against the proponent.)

ENCLOSURE 13

Note No. #1

URGENCY MINUTES

In view of the urgency expressed by concerned HoD (Envt.) and duly recommended by D(T/P&P), the extract of the draft minutes in respect of the following subject proposal is as follows:

Item No. 494.4(6):

Proposal seeking approval of Mining Plan and Mine Closure Plan of Amrapali Expansion OCP (Phase-I) (Capacity 25 MTPA) with Project Area of 619.87Ha and mine closure cost of Rs. 5704.05 lakh.

The Board was apprised by GM(E&F) regarding the subject proposal seeking approval **of Mining Plan and Mine Closure Plan of Amrapali Expansion OCP (Phase-I) (Capacity 25 MTPA).**

The following salient points were presented for appraisal:

1. Amrapali OCP is an existing project operating at an EC Capacity of 14.40 MTPA.
2. The Expansion PR of Amrapali OCP has been planned for a rated capacity of 25 MTPA/35 MTPA within the project area of 2478.89 Ha. This EPR has been approved by CIL Board on 11.02.2020.
3. It has been decided by CCL to undertake the expansion of Amrapali OCP in a phased manner. Phase-I has been planned excluding un-diverted forestland within the approved PR boundary. Accordingly, application of Amrapali Expansion OCP (Phase-I) for Terms of Reference was submitted on 21.04.2020. ToR was issued on 21.05.2020 and Public Hearing was held on 17.11.2020.
4. Approval of Mining Plan and mine Closure Plan is required for consideration of the proposal for Environmental clearance by EAC, MoEF&CC.

The following data were also appraised to the Board.

Balance Mineable reserve: 79.50 M.Te.

Life of the mine: 4 Years

Land details- Total project area is 619.87 ha.

Mine closure cost- Rs.5704.05 lakh

The Board noted the thickness of coal seams and structural disturbances present in the project.

After detailed deliberations the Board approved the **Mining Plan and Mine Closure plan of Amrapali Expansion OCP (Phase-I) (Capacity 25 MTPA) with Project Area of 619.87 Ha and mine closure cost of Rs. 5704.05 lakh for obtaining EC from MoEF&CC as per EIA Notification, 2006.**

Submitted for kind perusal and if agreed, may kindly be put up to CMD, CCL for approval, please.

08/12/2020 4:02 PM

RAVI PRAKASH
(COMPANY SECRETARY)

Note No. #2

Agreed.

08/12/2020 4:16 PM

BHOLA SINGH
(DIRECTOR(TECHNICAL/PROJECT & PLANNING))

Note No. #3

Agreed.

08/12/2020 5:54 PM

P.M.PRASAD
(CHAIRMAN CUM MANAGING DIRECTOR)

ENCLOSURE 14

S.No 14: Plan of OB Dumping and re-handling and management of enhance capacity to be given with proper layout

Reply:

The total volume of OBR is estimated as 99.36 M.Cum including 15.65 M.cum proposed to be re-handled (Honhe Dump on Western Section). 24.41 M.Cum is proposed to be placed in the external dump(Dump A) and 52.47 M.Cum will be backfilled in the excavated quarry/ mine void (Dump B) and the balance 22.48 M.Cum will be backfilled in the internal dump (Dump C).

SN	Dump	Details
1	Dump-A(External Dump)	Area of Dump: 89.16 Ha Top RL +530m. (60m above G.L) Vol. of OB: 24.41 M.Cum. (Excluding 16 M.Cum of OB already accommodated in this external dump)
2	Dump-B (Internal Dump in the Eastern Quarry)	Area of Dump: 200.64 Ha Top R.L: +530m Vol. of OB: Approx. 52.47 M.Cum.
3	Dump-C (Internal Dump in the Western Quarry)	Area of Dump: 71.07 Ha. Top R.L: +530m Vol. of OB: Approx. 22.48 M.Cum

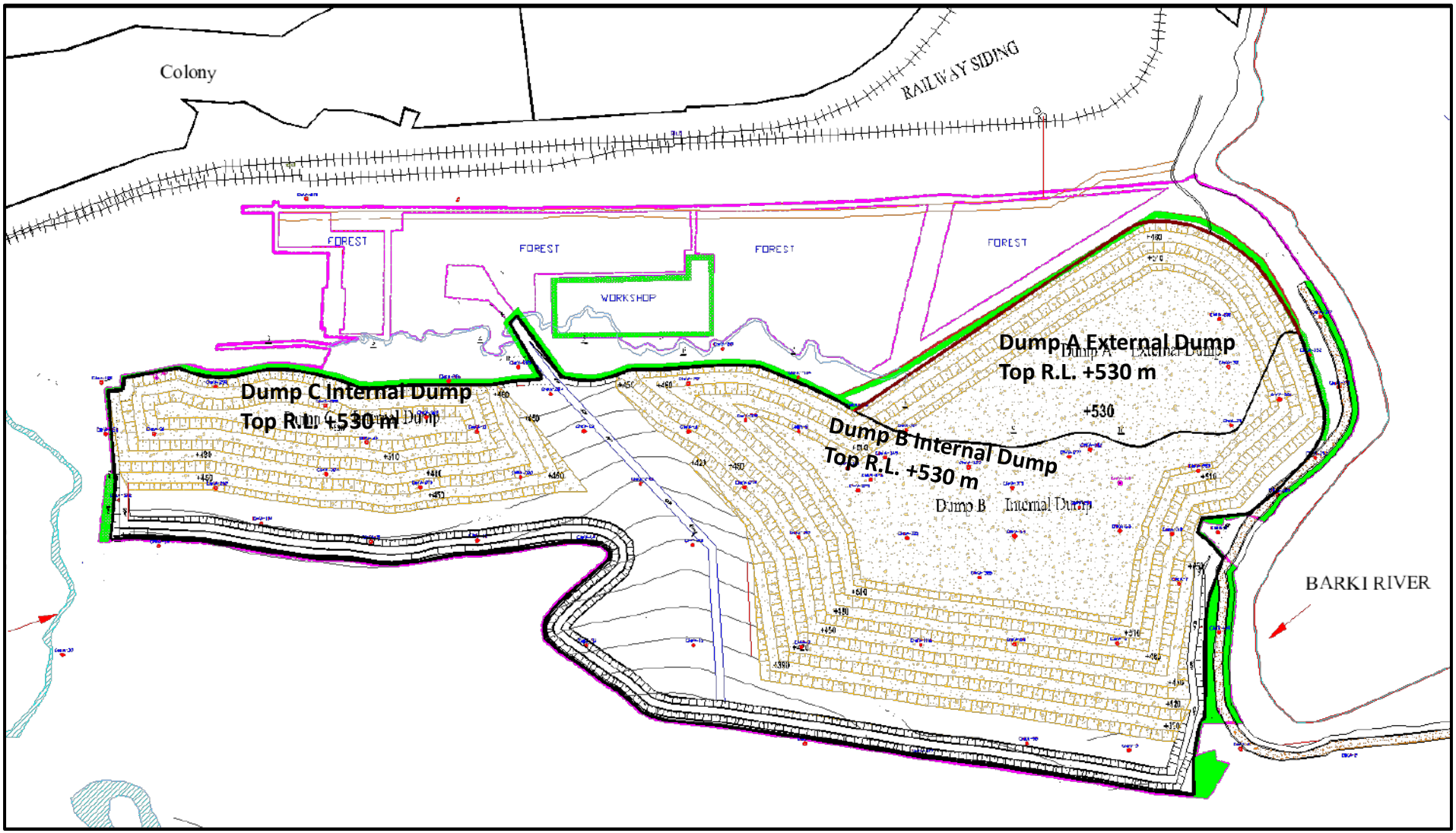


Fig: Final Stage Dump Plan of Amrapali Expansion OCP (Phase-I) 25 MTPA

ENCLOSURE 15

Customer	**Central Coalfields Limited**				
Project	Preparation of Geo-Referenced Boundary Map (in Shape File) of Forest Land of Amrapali Railway Siding,CCL			Job No.	
Subject	Activity	Name	Designation	Signature	Date
LANDUSE Plan of Amrapali Railway Siding, CCL	Surveyed / Processed by	S.Roy	Sr.Surveyor(C)		
		S.Prasad	Hd. Surveyor(C)		
		S.K.Dixit	Ch. Manager(M)		
	Checked by	M.Rastogi	Ch.Manager(C)		
	Approved by	R.Kumar	GM(Geomatics)		
cmpdi A Mini Ratna Company	Scale- 1:4000			Sheet 1 of 1	
	Drg No. HQS&DN20068A			REV. No. -	

ENCLOSURE 16

Event Report

Date/Time Long at 14:33:28 January 14, 2021
Trigger Source Geo: 0.500 mm/s
Range Geo: 254.0 mm/s
Record Time 3.0 sec at 2048 sps
Operator/Setup: Operator/Amrapali OCP.mmb

Notes
Location: Amrapali OCP
Client: Central Coal Fields Limited
User Name: IOCL
General: Coal Mines

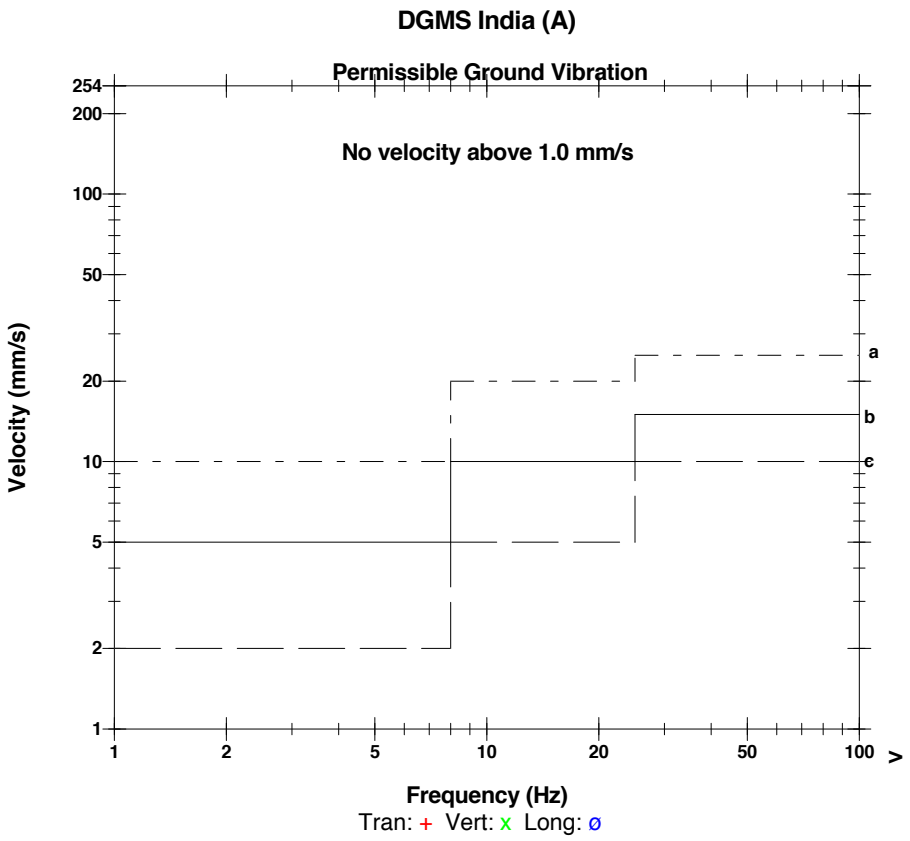
Microphone Linear Weighting
PSPL <88 dB(L) <0.500 pa.(L)
ZC Freq 73 Hz
Channel Test Check (Freq = 0.0 Hz Amp = 0 mv)

	Tran	Vert	Long	
PPV	0.276	0.110	0.575	mm/s
ZC Freq	12.3	102	16.8	Hz
Time (Rel. to Trig)	2.675	2.480	1.080	sec
Peak Acceleration	0.012	0.010	0.020	g
Peak Displacement	0.003	0.003	0.005	mm
Sensor Check	Passed	Check	Passed	

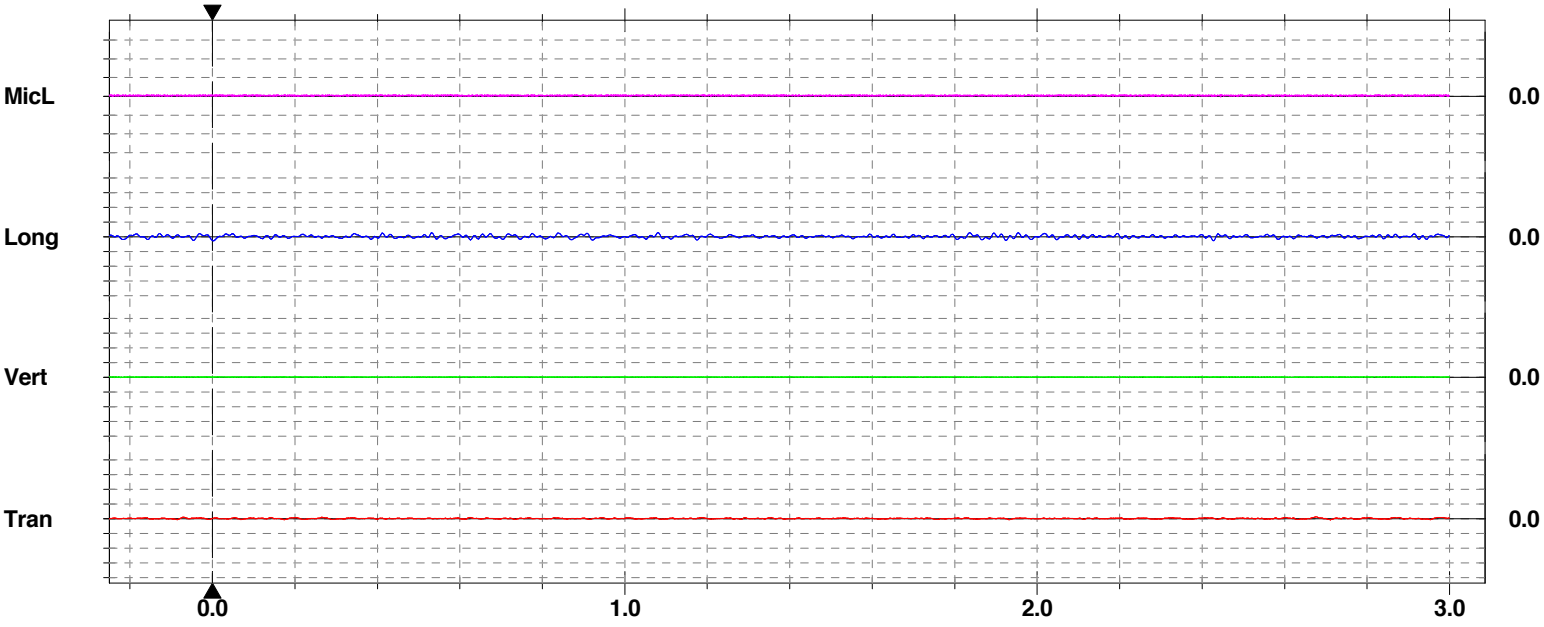
Peak Vector Sum 0.581 mm/s at 1.080 sec
N/A: Not Applicable

Serial Number UM16972 V 10-89 Micromate ISEE
Battery Level 3.8 Volts
Unit Calibration October 21, 2020 by UES New Delhi
File Name UM16972_20210114143328.IDFW

Post Event Notes
Amrapali OCP
Distance from blast about 190 mtrs.



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 1.000 pa.(L)/div
Trigger =

Event Report

Date/Time Long at 14:33:43 January 14, 2021
Trigger Source Geo: 0.500 mm/s
Range Geo: 254.0 mm/s
Record Time 3.0 sec at 2048 sps
Operator/Setup: Operator/Amrapali OCP.mmb

Serial Number UM16972 V 10-89 Micromate ISEE
Battery Level 3.8 Volts
Unit Calibration October 21, 2020 by UES New Delhi
File Name UM16972_20210114143343.IDFW

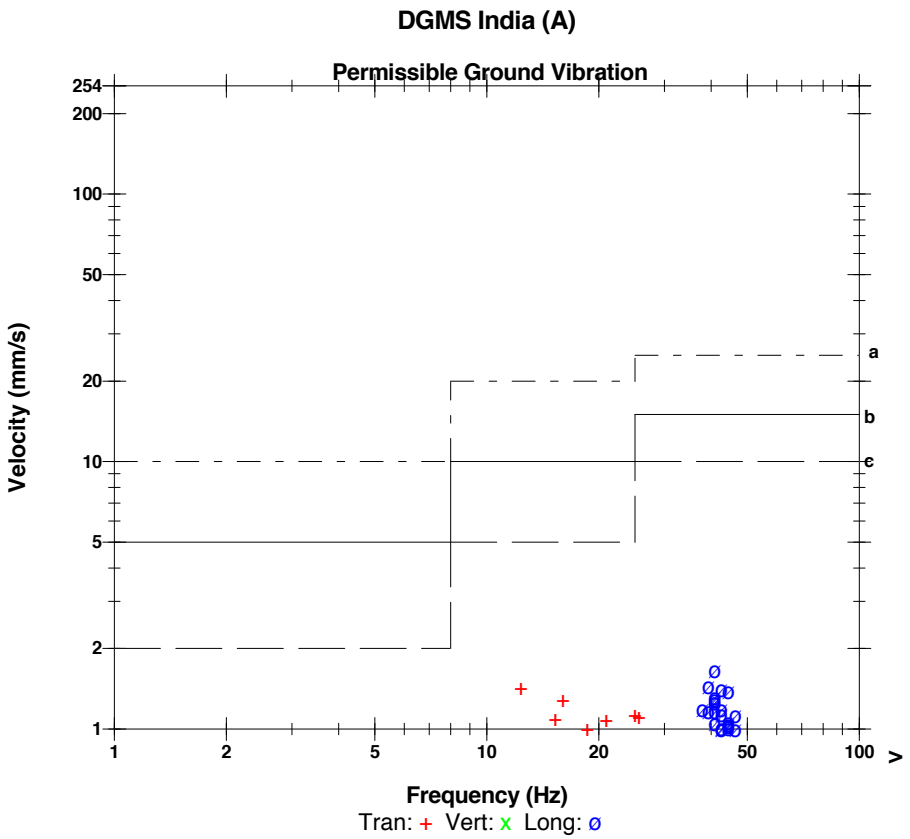
Notes
Location: Amrapali OCP
Client: Central Coal Fields Limited
User Name: IOCL
General: Coal Mines

Post Event Notes
Amrapali OCP
DIstance from blast about 175 mtrs.

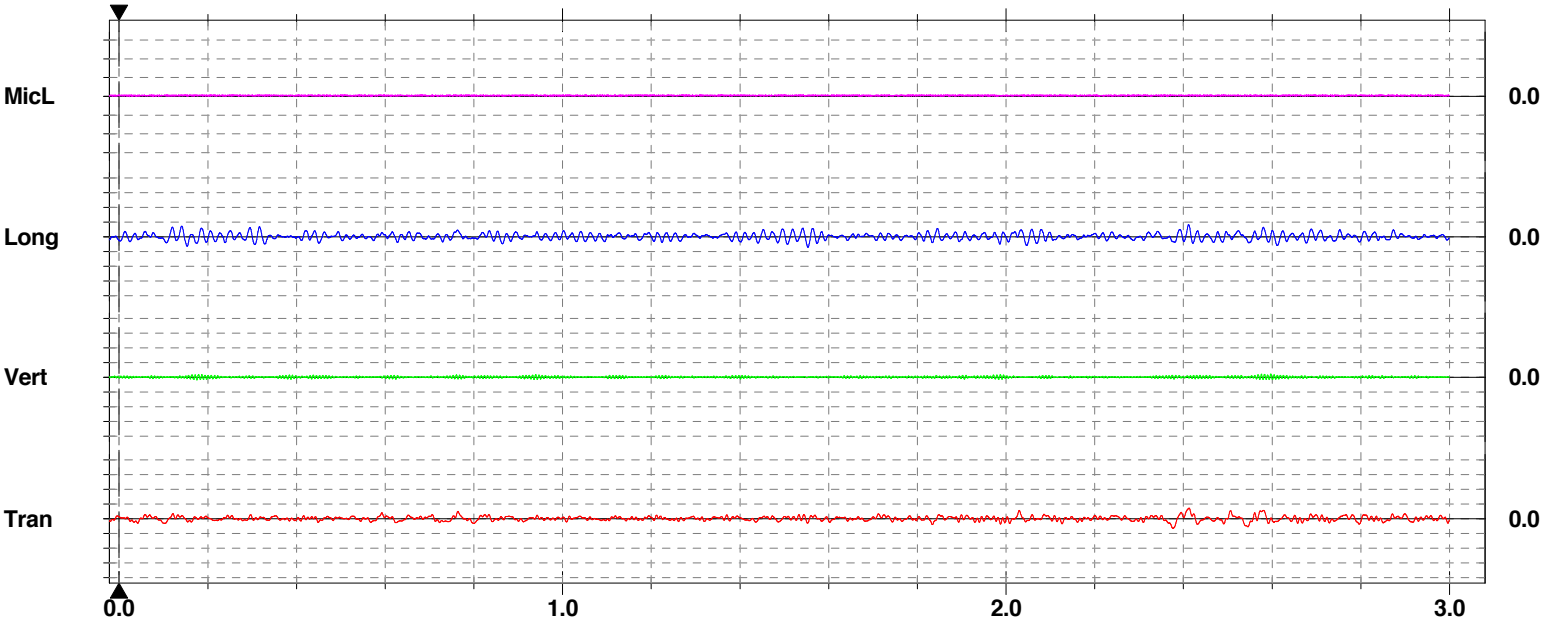
Microphone Linear Weighting
PSPL <88 dB(L) <0.500 pa.(L)
ZC Freq 114 Hz
Channel Test Check (Freq = 0.0 Hz Amp = 0 mv)

	Tran	Vert	Long	
PPV	1.434	0.441	1.671	mm/s
ZC Freq	12.3	128	41	Hz
Time (Rel. to Trig)	2.413	2.597	2.412	sec
Peak Acceleration	0.039	0.061	0.079	g
Peak Displacement	0.014	0.001	0.006	mm
Sensor Check	Passed	Check	Passed	

Peak Vector Sum 2.188 mm/s at 2.412 sec
N/A: Not Applicable



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 1.000 pa.(L)/div
Trigger =

Event Report

Date/Time Long at 14:17:09 January 15, 2021
Trigger Source Geo: 0.500 mm/s
Range Geo: 254.0 mm/s
Record Time 3.0 sec at 2048 sps
Operator/Setup: Operator/Amrapali OCP.mmb

Serial Number UM16972 V 10-89 Micromate ISEE
Battery Level 3.8 Volts
Unit Calibration October 21, 2020 by UES New Delhi
File Name UM16972_20210115141709.IDFW

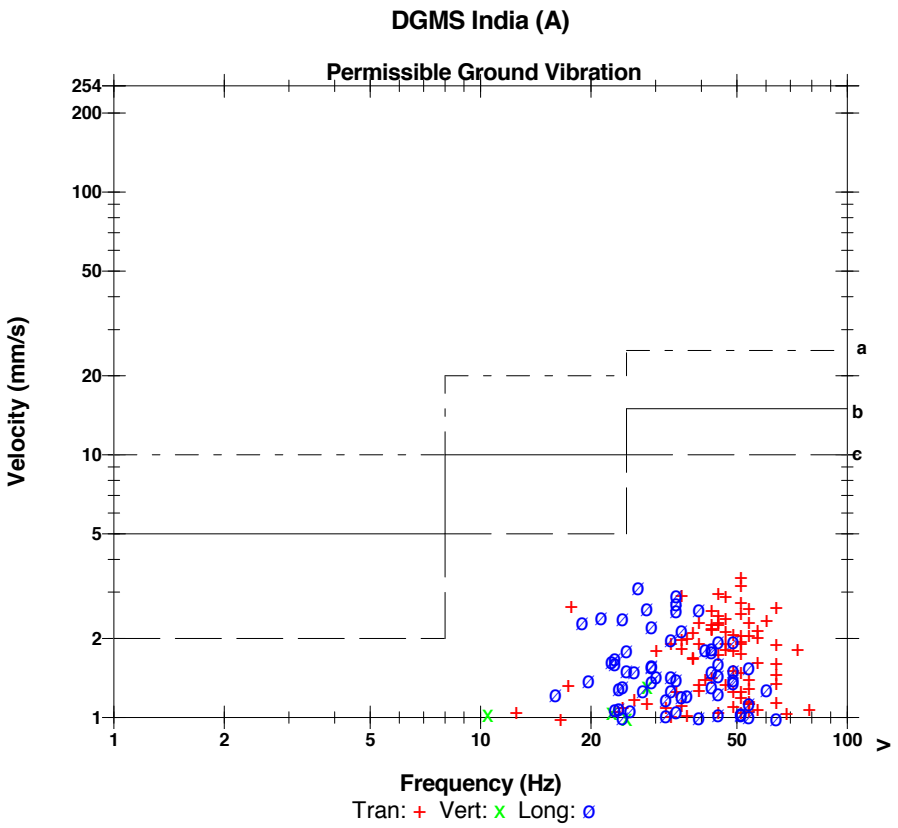
Notes
Location: Amrapali OCP
Client: Central Coal Fields Limited
User Name: IOCL
General: Coal Mines

Post Event Notes
Amrapali OCP
Distance from blast about 160 mtrs.

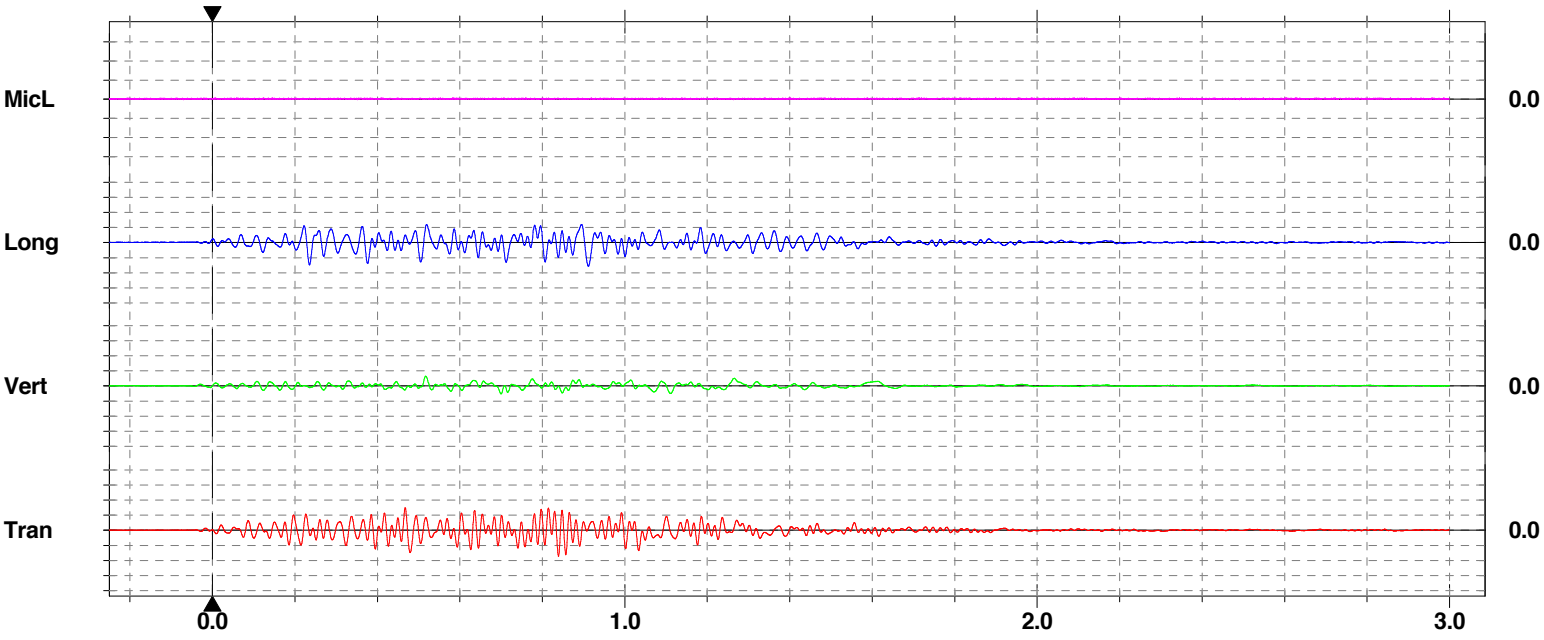
Microphone Linear Weighting
PSPL <88 dB(L) <0.500 pa.(L)
ZC Freq 93 Hz
Channel Test Check (Freq = 0.0 Hz Amp = 0 mv)

	Tran	Vert	Long	
PPV	3.444	1.316	3.129	mm/s
ZC Freq	51	28	27	Hz
Time (Rel. to Trig)	0.839	0.517	0.912	sec
Peak Acceleration	0.115	0.033	0.107	g
Peak Displacement	0.016	0.012	0.019	mm
Sensor Check	Passed	Passed	Passed	

Peak Vector Sum 3.960 mm/s at 0.839 sec
N/A: Not Applicable



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 1.000 pa.(L)/div
Trigger = ▶——◀

Event Report

Date/Time Tran at 14:17:08 January 17, 2021
Trigger Source Geo: 0.500 mm/s
Range Geo: 254.0 mm/s
Record Time 3.0 sec at 2048 sps
Operator/Setup: Operator/Amrapali OCP.mmb

Notes
Location: Amrapali OCP
Client: Central Coal Fields Limited
User Name: IOCL
General: Coal Mines

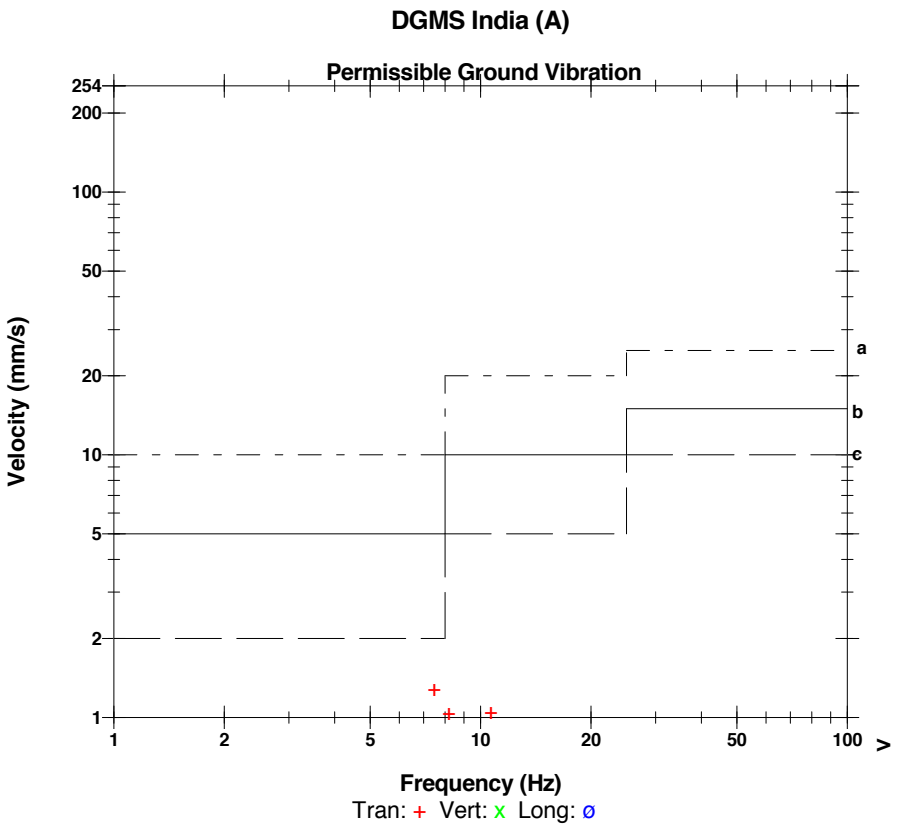
Serial Number UM16972 V 10-89 Micromate ISEE
Battery Level 3.8 Volts
Unit Calibration October 21, 2020 by UES New Delhi
File Name UM16972_20210117141708.IDFW

Post Event Notes
Amrapali OCP
Distance from blast about 150 mtrs.

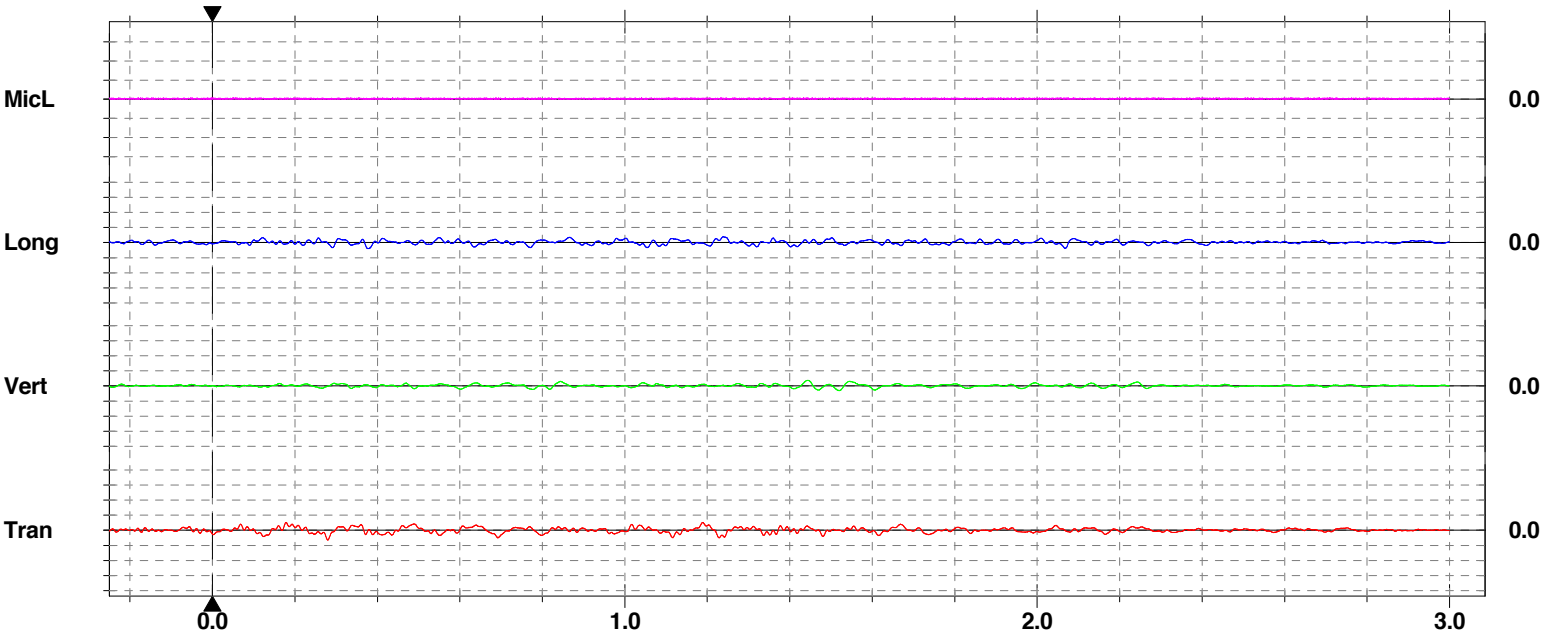
Microphone Linear Weighting
PSPL <88 dB(L) <0.500 pa.(L)
ZC Freq 171 Hz
Channel Test Check (Freq = 0.0 Hz Amp = 0 mv)

	Tran	Vert	Long	
PPV	1.293	0.765	0.804	mm/s
ZC Freq	7.5	16.3	24	Hz
Time (Rel. to Trig)	0.279	1.445	0.376	sec
Peak Acceleration	0.021	0.013	0.026	g
Peak Displacement	0.015	0.009	0.010	mm
Sensor Check	Passed	Passed	Passed	

Peak Vector Sum 1.296 mm/s at 0.280 sec
N/A: Not Applicable



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 1.000 pa.(L)/div
Trigger =

Event Report

Date/Time Tran at 14:05:49 January 19, 2021
Trigger Source Geo: 0.500 mm/s
Range Geo: 254.0 mm/s
Record Time 3.0 sec at 2048 sps
Operator/Setup: Operator/Amrapali OCP.mmb

Notes
Location: Amrapali OCP
Client: Central Coal Fields Limited
User Name: IOCL
General: Coal Mines

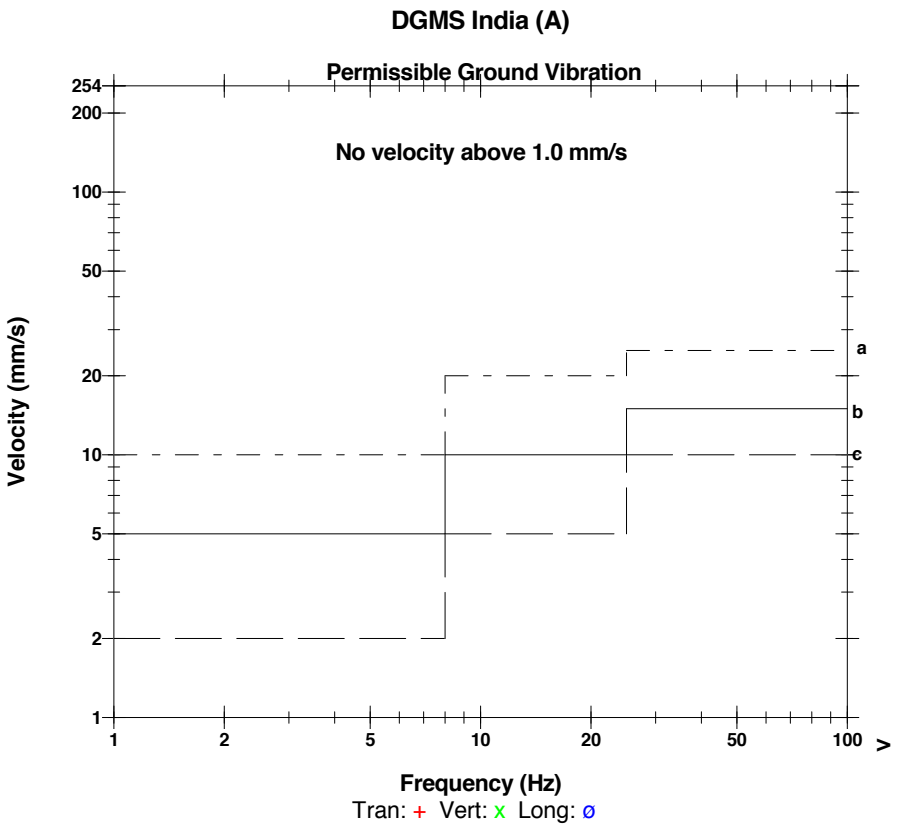
Serial Number UM16972 V 10-89 Micromate ISEE
Battery Level 3.8 Volts
Unit Calibration October 21, 2020 by UES New Delhi
File Name UM16972_20210119140549.IDFW

Post Event Notes
Amrapali OCP
Distance from blast about 175 mtrs.

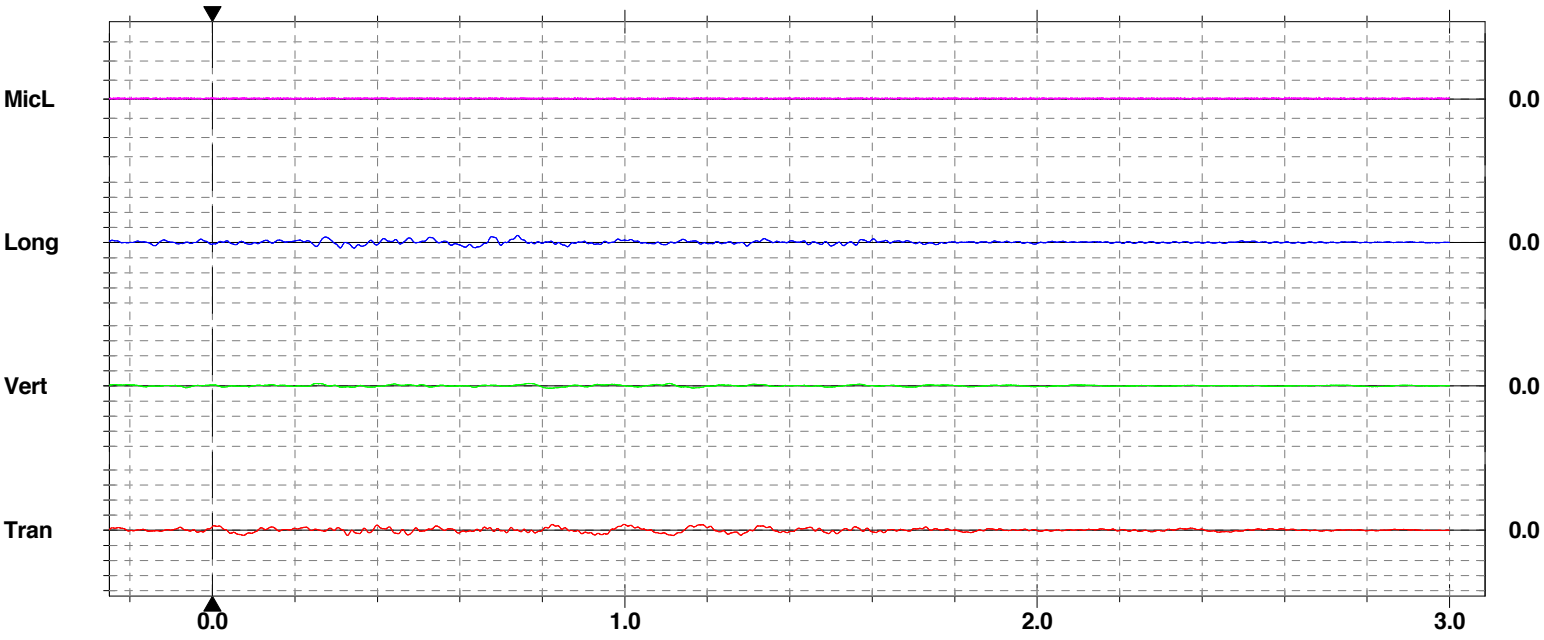
Microphone Linear Weighting
PSPL <88 dB(L) <0.500 pa.(L)
ZC Freq 171 Hz
Channel Test Check (Freq = 0.0 Hz Amp = 0 mv)

	Tran	Vert	Long	
PPV	0.804	0.355	0.962	mm/s
ZC Freq	5.7	7.1	10.6	Hz
Time (Rel. to Trig)	0.998	0.768	0.740	sec
Peak Acceleration	0.021	0.010	0.020	g
Peak Displacement	0.018	0.007	0.017	mm
Sensor Check	Passed	Passed	Passed	

Peak Vector Sum 0.975 mm/s at 0.740 sec
N/A: Not Applicable



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 1.000 pa.(L)/div
Trigger =

Event Report

Date/Time Long at 14:19:40 January 20, 2021
Trigger Source Geo: 0.500 mm/s
Range Geo: 254.0 mm/s
Record Time 3.0 sec at 2048 sps
Operator/Setup: Operator/Amrapali OCP.mmb

Notes
Location: Amrapali OCP
Client: Central Coal Fields Limited
User Name: IOCL
General: Coal Mines

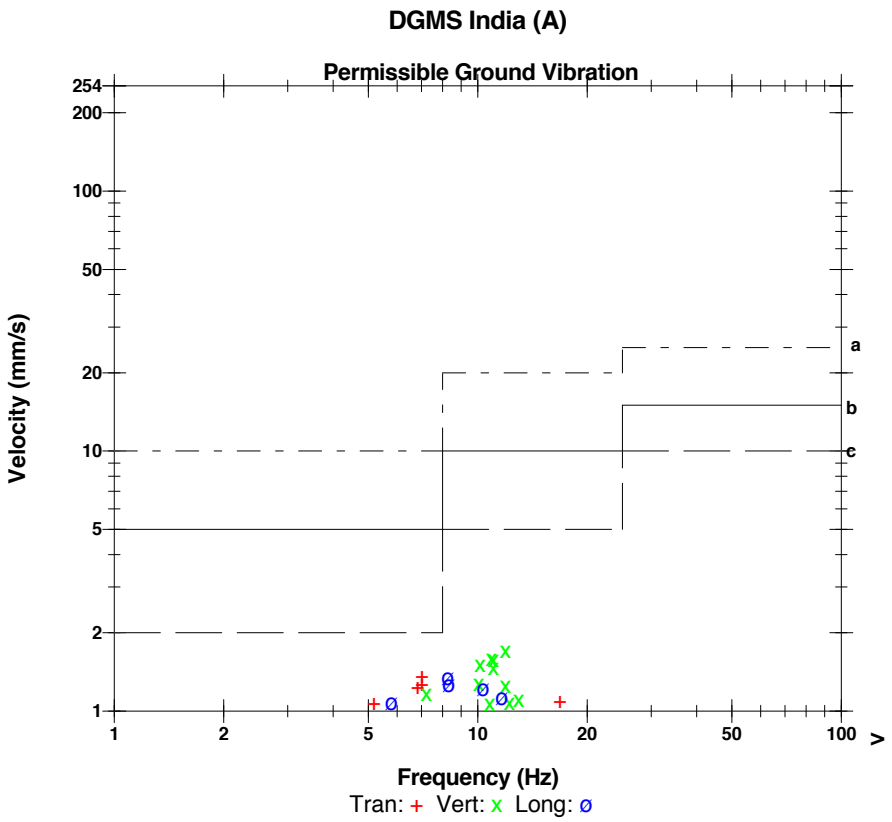
Serial Number UM16972 V 10-89 Micromate ISEE
Battery Level 3.8 Volts
Unit Calibration October 21, 2020 by UES New Delhi
File Name UM16972_20210120141940.IDFW

Post Event Notes
Amrapali OCP
Distance from blast about 175 mtrs.

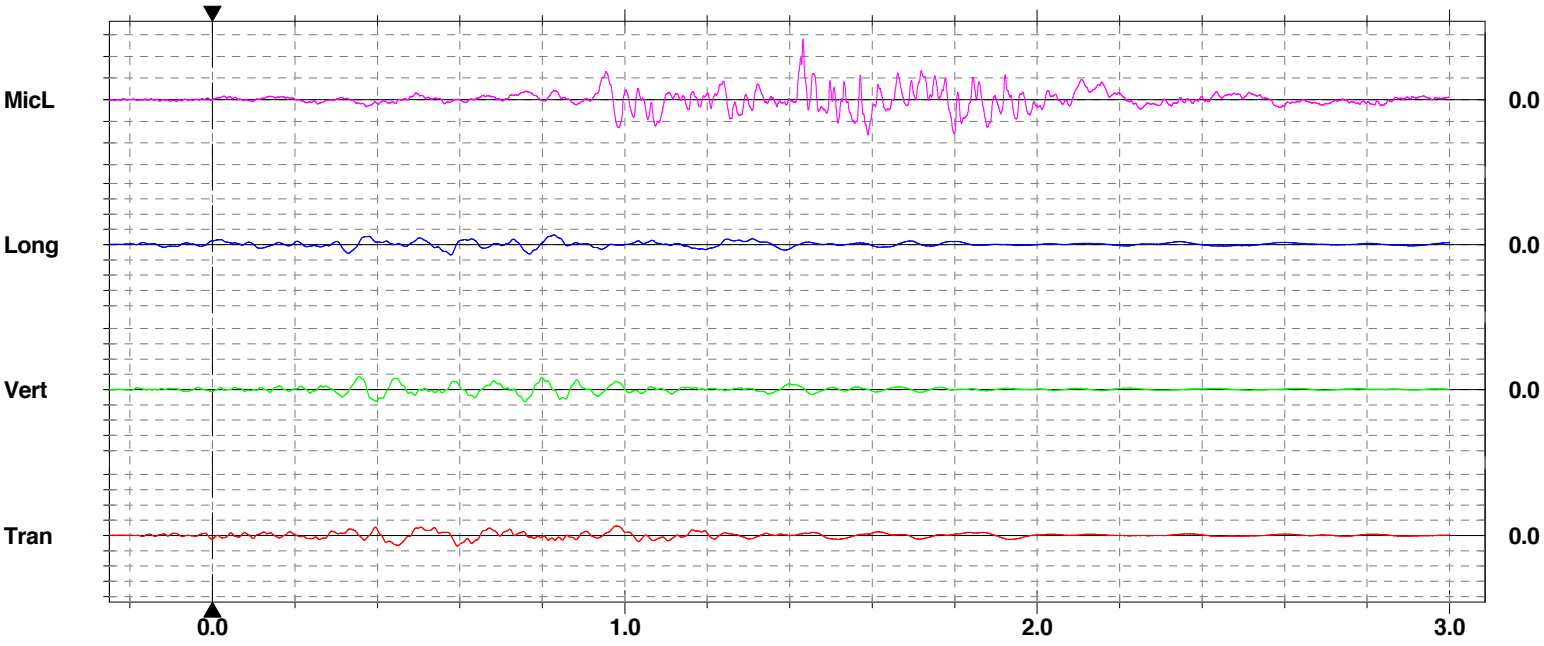
Microphone Linear Weighting
PSPL 116.9 dB(L) 13.96 pa.(L) at 1.432 sec
ZC Freq 19.3 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 1188 mv)

	Tran	Vert	Long	
PPV	1.379	1.718	1.356	mm/s
ZC Freq	7.0	11.9	8.3	Hz
Time (Rel. to Trig)	0.594	0.354	0.578	sec
Peak Acceleration	0.018	0.026	0.021	g
Peak Displacement	0.032	0.025	0.030	mm
Sensor Check	Passed	Passed	Passed	

Peak Vector Sum 1.957 mm/s at 0.447 sec



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 5.000 pa.(L)/div
Trigger = ▶——◀

Event Report

Date/Time Tran at 14:49:58 January 21, 2021
Trigger Source Geo: 0.500 mm/s
Range Geo: 254.0 mm/s
Record Time 3.0 sec at 2048 sps
Operator/Setup: Operator/Amrapali OCP.mmb

Serial Number UM16972 V 10-89 Micromate ISEE
Battery Level 3.8 Volts
Unit Calibration October 21, 2020 by UES New Delhi
File Name UM16972_20210121144958.IDFW

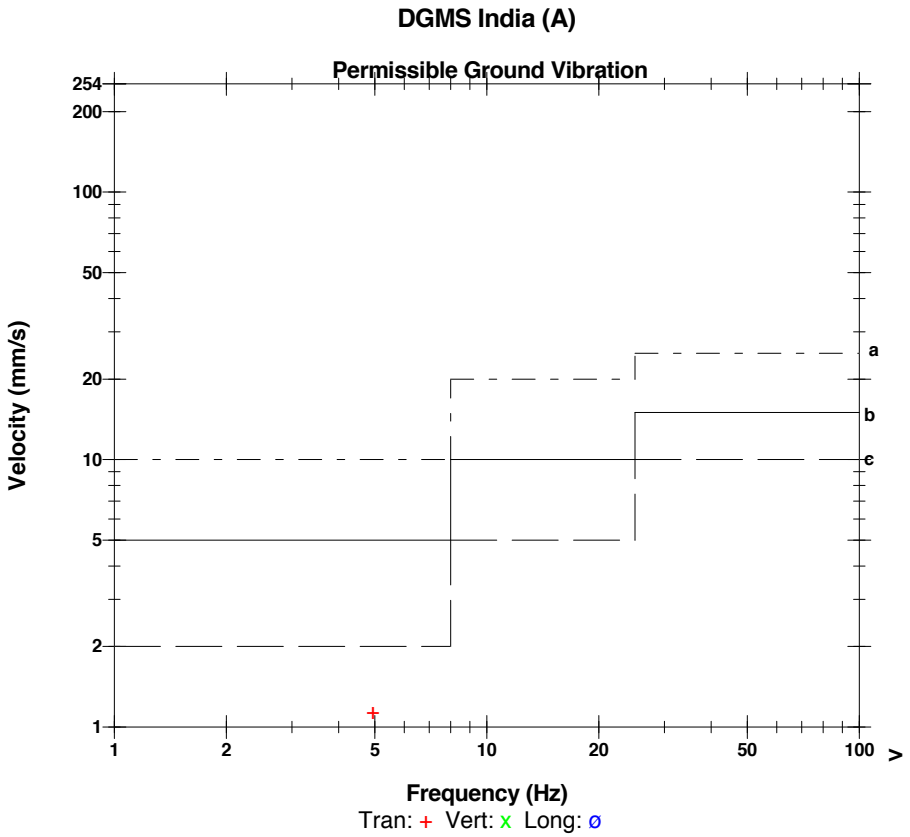
Post Event Notes
Amrapali OCP
Distance from blast about 185 mtrs.

Notes
Location: Amrapali OCP
Client: Central Coal Fields Limited
User Name: IOCL
General: Coal Mines

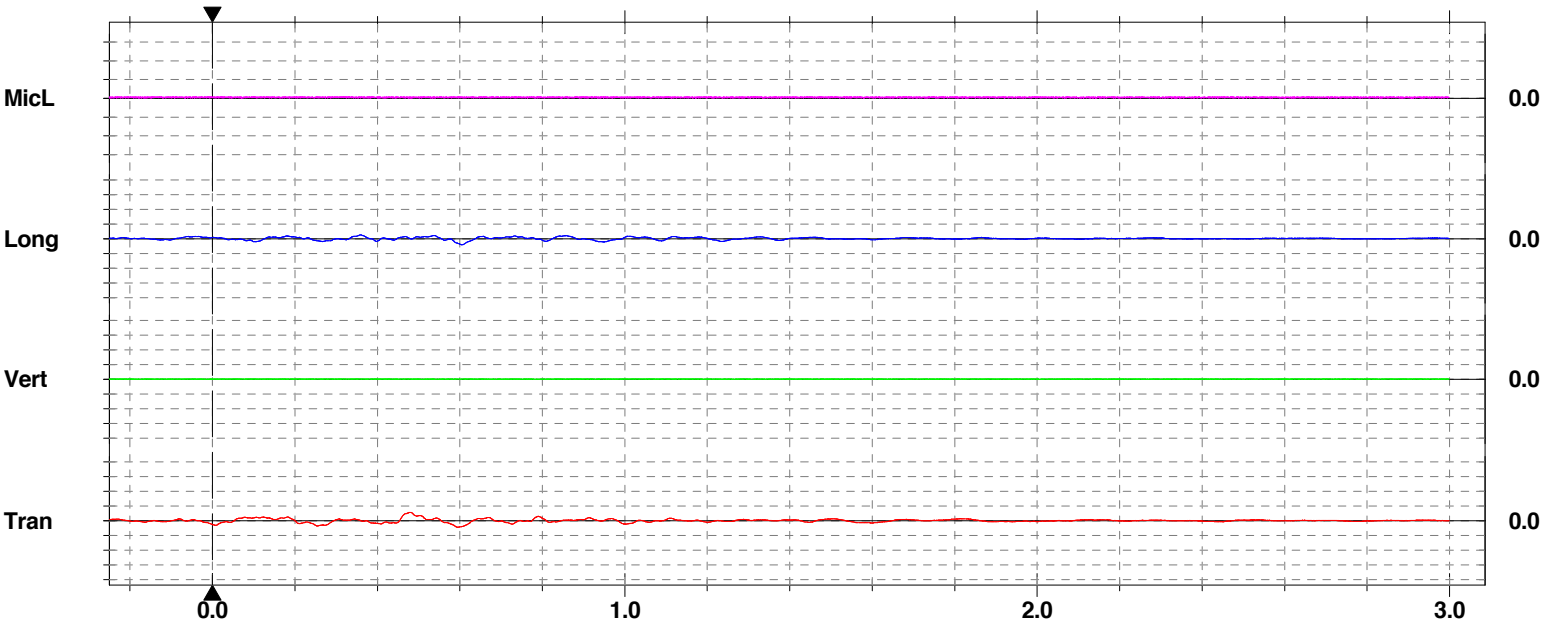
Microphone Linear Weighting
PSPL <88 dB(L) <0.500 pa.(L)
ZC Freq 18.3 Hz
Channel Test Check (Freq = 0.0 Hz Amp = 0 mv)

	Tran	Vert	Long	
PPV	1.151	0.063	0.812	mm/s
ZC Freq	4.9	23	8.6	Hz
Time (Rel. to Trig)	0.478	-0.055	0.604	sec
Peak Acceleration	0.013	0.010	0.012	g
Peak Displacement	0.028	0.004	0.013	mm
Sensor Check	Passed	Check	Passed	

Peak Vector Sum 1.152 mm/s at 0.478 sec
N/A: Not Applicable



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 1.000 pa.(L)/div
Trigger =

Event Report

Date/Time Tran at 13:54:15 January 23, 2021
Trigger Source Geo: 0.500 mm/s
Range Geo: 254.0 mm/s
Record Time 3.0 sec at 2048 sps
Operator/Setup: Operator/Amrapali OCP.mmb

Notes
Location: Amrapali OCP
Client: Central Coal Fields Limited
User Name: IOCL
General: Coal Mines

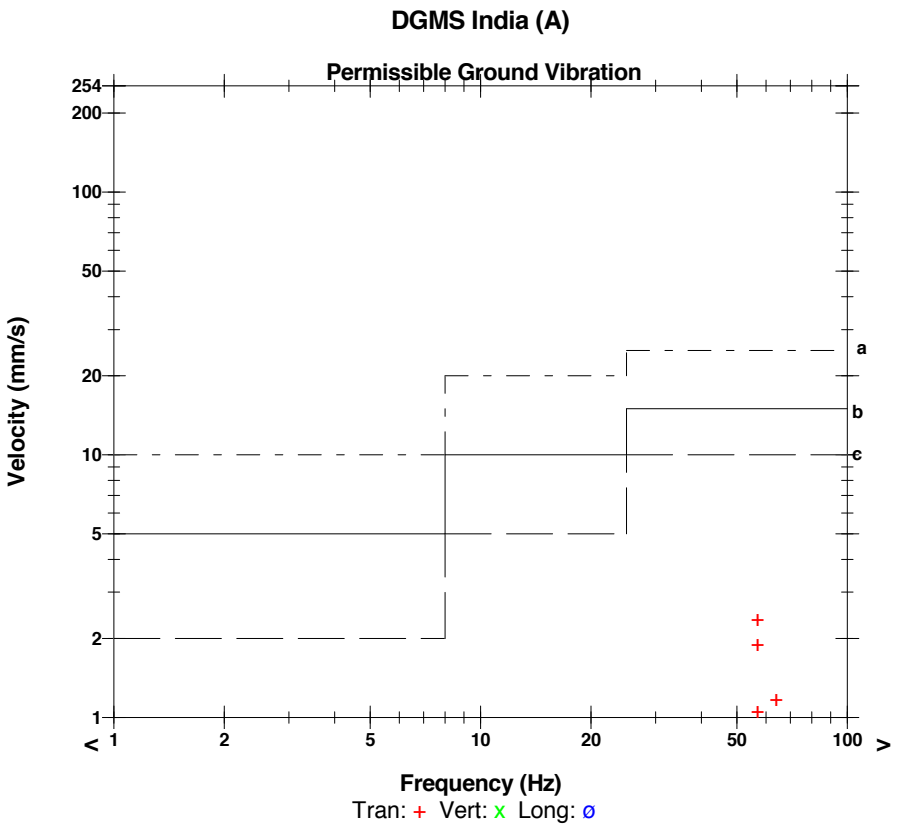
Serial Number UM16972 V 10-89 Micromate ISEE
Battery Level 3.8 Volts
Unit Calibration October 21, 2020 by UES New Delhi
File Name UM16972_20210123135415.IDFW

Post Event Notes
Amrapali OCP
Distance from blast about 150 mtrs.

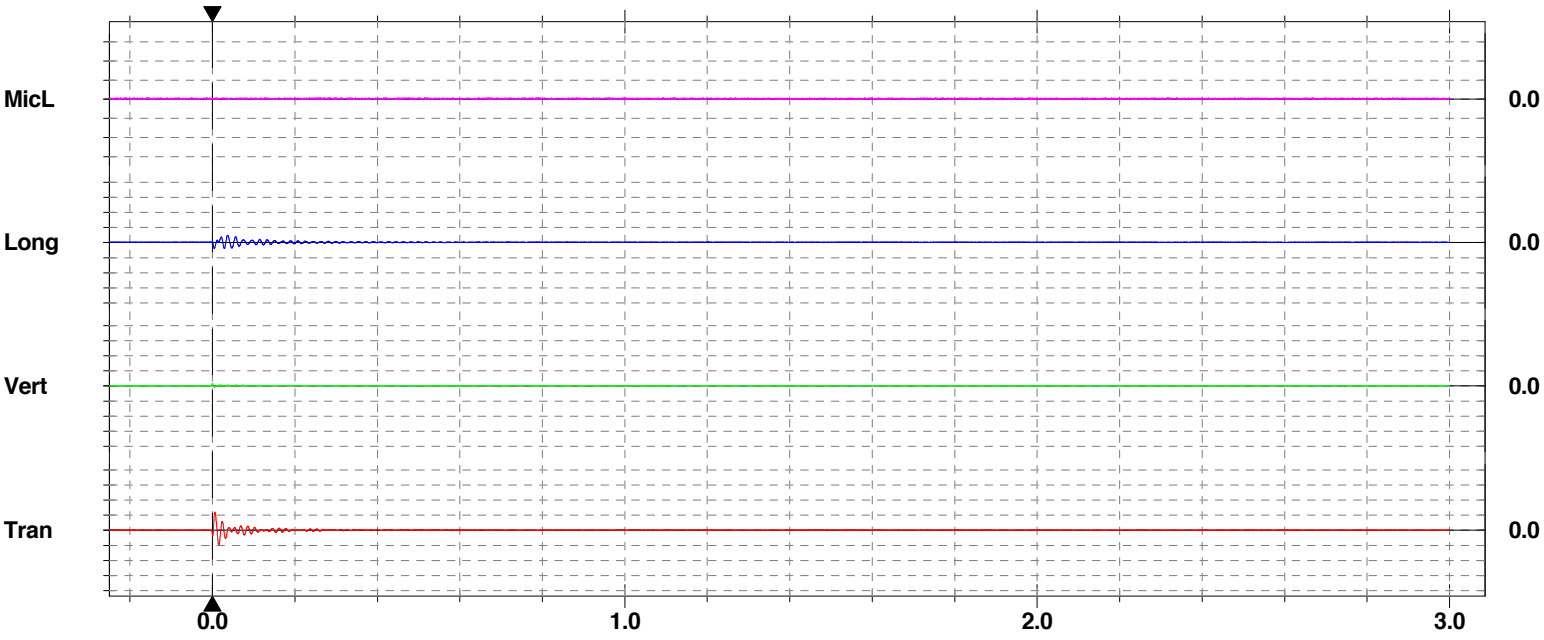
Microphone Linear Weighting
PSPL <88 dB(L) <0.500 pa.(L)
ZC Freq 85 Hz
Channel Test Check (Freq = 0.0 Hz Amp = 0 mv)

	Tran	Vert	Long	
PPV	2.396	0.300	0.977	mm/s
ZC Freq	57	N/A	49	Hz
Time (Rel. to Trig)	0.005	-0.000	0.037	sec
Peak Acceleration	0.107	0.021	0.038	g
Peak Displacement	0.007	0.038	0.029	mm
Sensor Check	Passed	Passed	Passed	

Peak Vector Sum 2.494 mm/s at 0.005 sec
N/A: Not Applicable



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 1.000 pa.(L)/div
Trigger =

Event Report

Date/Time Long at 14:14:23 January 23, 2021
Trigger Source Geo: 0.500 mm/s
Range Geo: 254.0 mm/s
Record Time 3.0 sec at 2048 sps
Operator/Setup: Operator/Amrapali OCP.mmb

Notes
Location: Amrapali OCP
Client: Central Coal Fields Limited
User Name: IOCL
General: Coal Mines

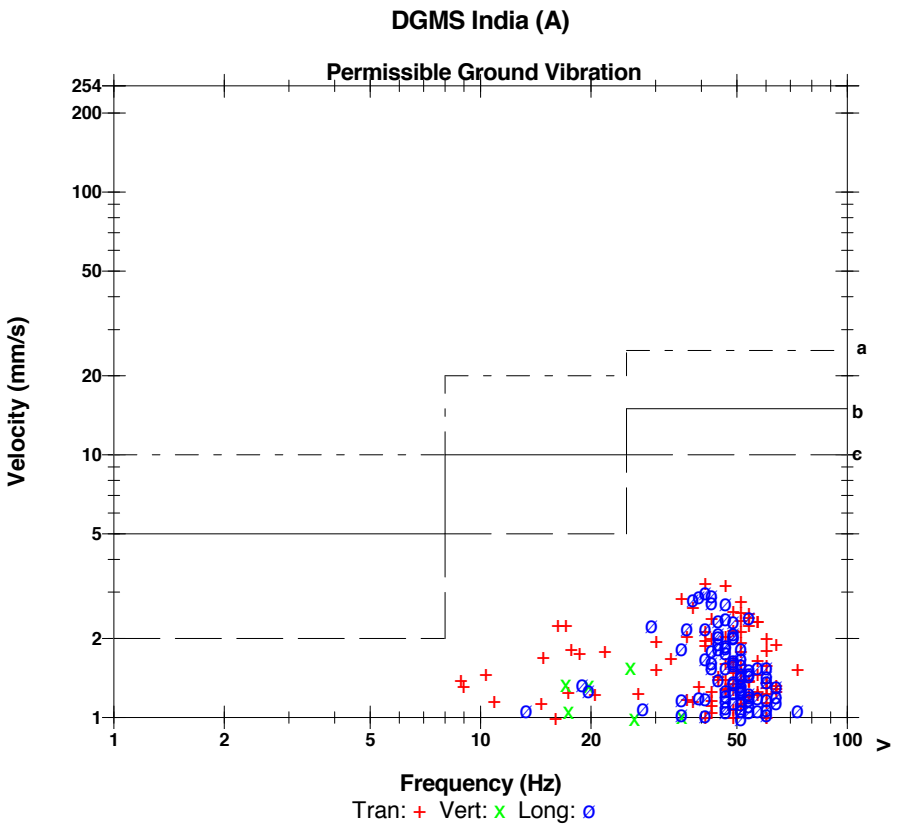
Microphone Linear Weighting
PSPL <88 dB(L) <0.500 pa.(L)
ZC Freq 114 Hz
Channel Test Check (Freq = 0.0 Hz Amp = 0 mv)

	Tran	Vert	Long	
PPV	3.271	1.561	3.003	mm/s
ZC Freq	41	26	41	Hz
Time (Rel. to Trig)	0.420	1.002	0.963	sec
Peak Acceleration	0.107	0.043	0.123	g
Peak Displacement	0.023	0.012	0.011	mm
Sensor Check	Passed	Passed	Passed	

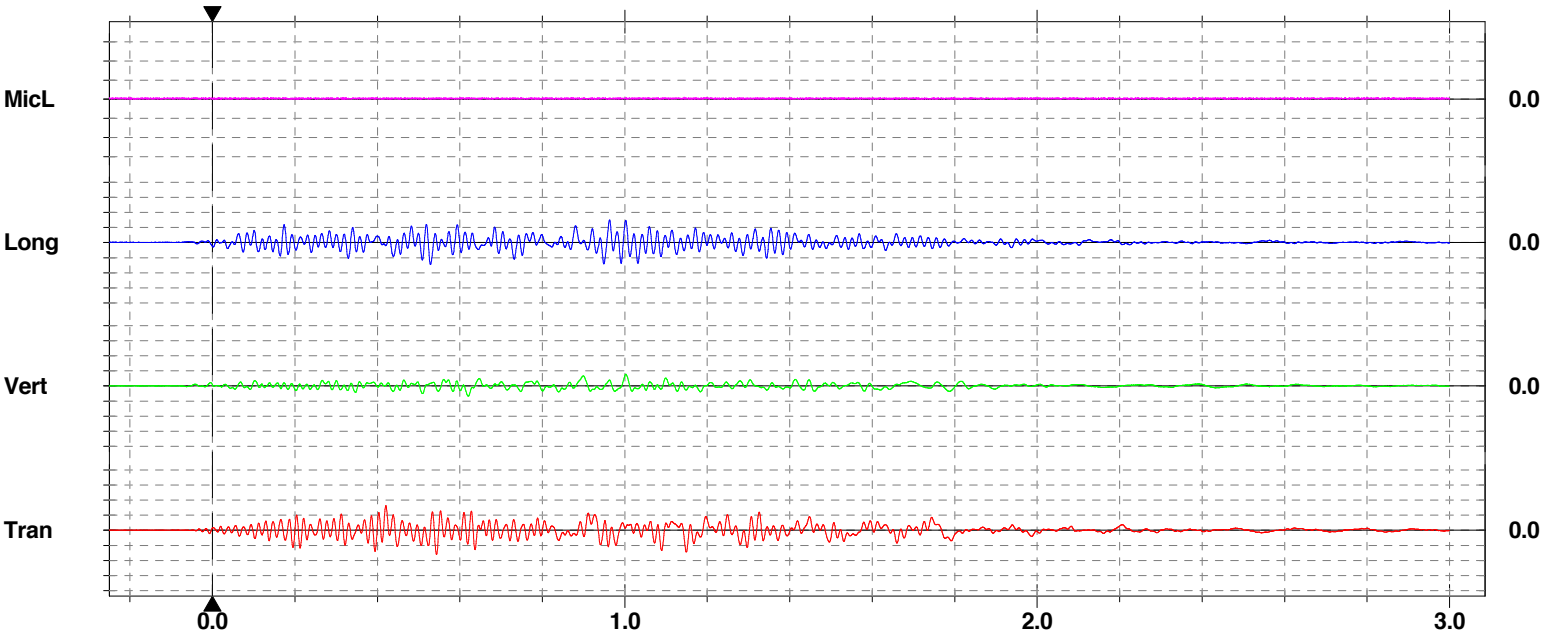
Peak Vector Sum 3.425 mm/s at 0.962 sec
N/A: Not Applicable

Serial Number UM16972 V 10-89 Micromate ISEE
Battery Level 3.8 Volts
Unit Calibration October 21, 2020 by UES New Delhi
File Name UM16972_20210123141423.IDFW

Post Event Notes
Amrapali OCP
Distance from blast about 140 mtrs.



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 1.000 pa.(L)/div
Trigger = ▶——◀

Event Report

Date/Time Vert at 15:34:31 January 31, 2021
Trigger Source Geo: 0.500 mm/s
Range Geo: 254.0 mm/s
Record Time 3.0 sec at 2048 sps
Operator/Setup: Operator/Amrapali OCP.mmb

Serial Number UM16972 V 10-89 Micromate ISEE
Battery Level 3.8 Volts
Unit Calibration October 21, 2020 by UES New Delhi
File Name UM16972_20210131153431.IDFW

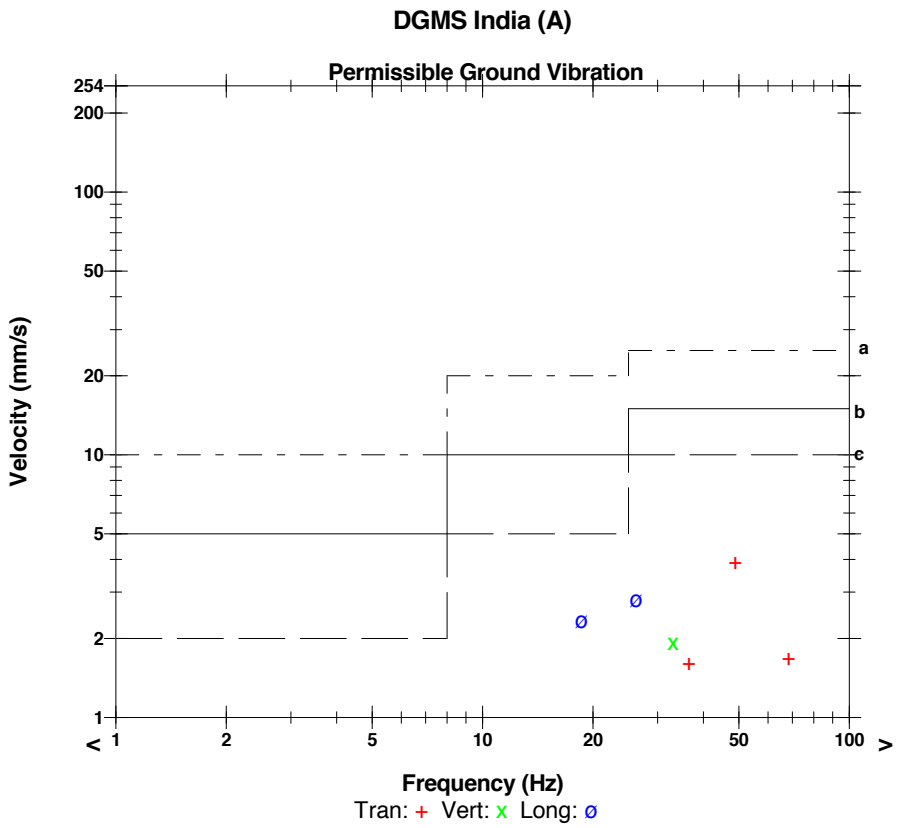
Notes
Location: Amrapali OCP
Client: Central Coal Fields Limited
User Name: IOCL
General: Coal Mines

Post Event Notes
Amrapali OCP
Distance from blast about 130 mtrs.

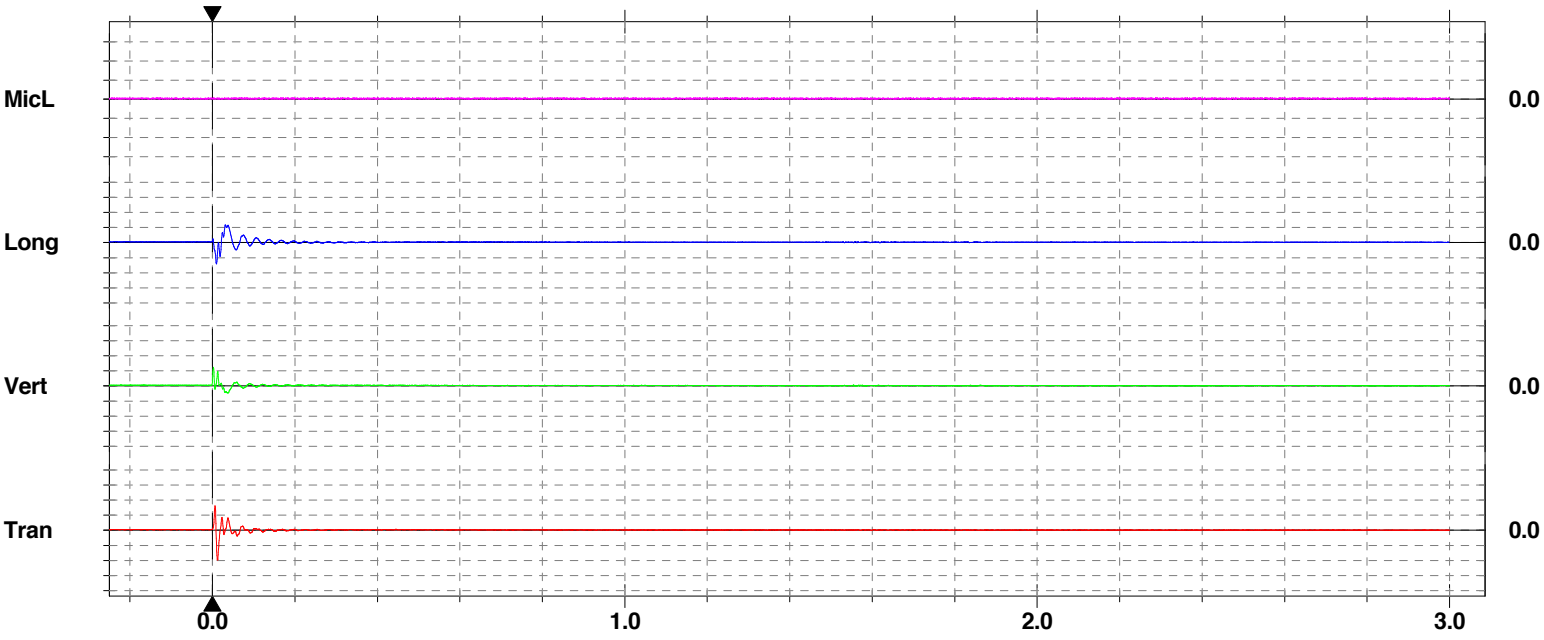
Microphone Linear Weighting
PSPL <88 dB(L) <0.500 pa.(L)
ZC Freq 73 Hz
Channel Test Check (Freq = 0.0 Hz Amp = 0 mv)

	Tran	Vert	Long	
PPV	3.941	2.491	2.822	mm/s
ZC Freq	49	N/A	26	Hz
Time (Rel. to Trig)	0.012	0.002	0.010	sec
Peak Acceleration	0.202	0.137	0.097	g
Peak Displacement	0.022	0.043	0.039	mm
Sensor Check	Passed	Passed	Passed	

Peak Vector Sum 4.614 mm/s at 0.012 sec
N/A: Not Applicable



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 1.000 pa.(L)/div
Trigger = ▶——◀

ENCLOSURE 17

Safeguards undertaken for minimizing the impact of blasting & vibration

1. From the on-site measurements of Peak Particle Velocity (PPV) and analysis of results of trial blasts at Amrapali OCP, under the existing geo-mining conditions, it may be recommended that the workings of Amrapali OCP can be extended within 300m but beyond 100m from nearby villages/hutments or dwellings etc, not belonging to CCL with a maximum explosive charge per delay 49.0 kg with other established blasting parameters, considering the threshold value of PPV 15mm/sec for a dominant frequency range of > 25 Hz.
2. Proper initiation system is being followed for restricting the maximum charge/delay and control of fly rock.
3. Free face is being maintained and blasted materials are cleared off before the commencement of blasting operations.
4. Blasting at Amrapali OCP is being conducted with muffling arrangement. Muffling of holes is being done with wire netting pieces (1.8m x 1.2m) overlain by 3 to 4 sand bags each 40 kg by weight.
5. The code of blasting signals shall be strictly followed as framed by the Mine Manager and means of effective communication should be utilized gainfully in mine. A siren is being used during blasting operation for warning the people before blasting and to give all clear signals after blasting.
6. Adequate training was imparted to Blasting Officer, Overman and to the Mining Sirdar who were continuously associated with blasting operations during the period of design of blast to the final observation of the blast. They have picked up the technique of controlled blasting as applicable to prevailing condition at Amrapali OCP Magadh Amrapali Area, CCL.
7. Mobile telephones are being switched off in the blasting area at the time of handling, charging and blasting of explosives.
8. The day-to-day blasting operations are being recorded in a bound paged showing the blast parameters, e.g. charge/hole, charge/delay, charge/round.
9. The blasting time is fixed during daytime only and it has been circulated to the concerned officials and displayed on the notice board.
10. The ground vibration monitoring reports is also being generated & submitted by M/s IOCL for monitoring of ground vibration emerging due to blasting.

ENCLOSURE 18

SN-17: PP shall submit additional provision i.e capital and recurring cost by proposing additional EMP measures including dust suppression as suggested by Ministry's Regional office

Reply:

Revised Environmental Management Plan

Year	Capital Cost of Environmental Control Measures Activity	Details	Estimated Capital Cost in Rs. Lakhs	Tentative time line of Completion
2021-22	Fixed sprinkling system of on Haul Road	1.30 km length along Haul road at Honhe side	90	Tender Floated. Work Order to be Issued. Tentative date of Completion: March 2021
	Fixed sprinkling system on Coal tranportation road at Honhe Village	1.3 km length	100	Tender Finalized. Tentative date of Completion: June 2021
	Fog Canon at Coal stock yard	1 no.	80	July 2021
	PCC Topping of Coal transportation road	5 km Length and 10 m Width of road	900	Tender Finalized. Tentative date of Completion: June 2021
	Road Sweeping Machines on CTR	2 nos.	150	Sept' 2021
	Vehicle wheel washing system on CTR	2 nos. on both ends of CTR	90	July 2021
	Wind Barriers along stock yard	1200 m along coal stock yard and	60	Sept 2021
	Wind Barriers along the Project boundary at Pachra Village and Ursu Village	3.1 km and 7 m Height	155	Sept 2021
	Wind Barriers along Coal Transportation road	Around 2000 m near Honhe village	100	July 2021

	Construction of Check dams	2 No.of Checkdams on Honhe nala and 4 no. of Checkdams on Binglat Nala	350	Tender Floated. Work Order to be Issued. Tentative date of Completion: March 2021
	Toe wall, Granland Drain and settling pond	1.5 km Toe wall and garland drain along OB dump,Top soil Dump	60	July 2021
	Diversion of Dudhmatia Nala	1500 m nala Diversion along the northern boundary of project	164.36	May-21
	Garland Drain	In between the OB dump and diverted nala of Length 1500m	60	May-21
	Embankment	Earthern Embankment with stone pitching and Toe wall along nala of Length 3100 m anf Height 3 m	210	Jun-21
	Piezometers	Additional 05 no. of Piezometers have been proposed to monitor the ground water level.	40	Tender Floated. Work Order to be Issued. Tentative date of Completion: March 2021
	Rain Water Harvesting System	Roof top rain water harvesting system at 35 locations	45	July 2021
	Continuous Air Quality monitoring systems	CAAQMS and Continuous PM10 Analyzer	125	Tender under process.
	Green Belt	Green belt along project, road, nala and embankment 17.42 Ha,	696.8	Monsoon 2021
	Afforestration	6.00 Ha	82	Monsoon 2021
	3-tier Avenue Plantation along Coal Transportation road	7.5 Ha of Avenue Plantation on CTR	30	Monsoon 2021
2022-23	Sewage Treatment Plant	Proposed township will be provided with integrated sewage treatment plant.	200	Construction work of colony has been started by NBCC Tentative date of Completion: March 2023
	Embankment along Barki River	Embankment will be provided along the Barki river and green belt will be developed.	500	Mar-23
	Green Belt	Green belt along project 7.20 Ha	288	
	Plantation on Reclaimed Land	10.16	35.56	Monsoon 2022

2023-24	Plantation on reclaimed land	50 Ha	175	Monsoon 2023
2024-25 & Post Closure	Plantation on reclaimed land	184 Ha	644	Monsoon 2024 & Post Closure
Conservation of Flora and Fauna		Conservation Measures for schedule-I species	4236	Throughout the life of Mine
Total EMP Cost			**9666.72**	

Estimated Revenue Cost of Environmental Control Measures

S No.	Particulars	Annual Revenue Cost (Rs Lakh)
1	Environmental Monitoring Cost	46.96
2	Plantation Maintenance Cost	46
3	Operation and Maintenance of Air Pollution control Measures	85
4	Maintenance cost for ETP and STP	15
5	Maintenance of RWH, Catch drains, Storm water drains and other developmement measures in Township	15
Total Revenue Cost		**207.96**