EASTERN COAL FIELDS LIMITED
A subsidiary of Coal India Limited.
Office of the Agent
C L Jambad & Siduli , Kenda Area.
P.O:- Bahula , Dist: - Burdwan.
Pin:-713322. West Bengal

UNDERTAKING

Information provided in Half yearly EC compliance report for the period October'23 to March'24 in respect of the following mines of Cluster no. 11 is true to the best of my knowledge:

SL NO.	MINES	NAME OF THE MANAGER	SIGNATURE OF THE MANAGER
1.	CL Jambad (UG+OC)	Harishankar Singh	23/4/2024
2.	Siduli (UG + OC)	Amrendra Kr. Choudhary	23/4/24

23/4/24

Agent
(CL Jambad & Siduli Mines)

EASTERN COAL FIELDS LIMITED
A subsidiary of Coal India Limited.
Office of the Agent
New Kenda Group of Mines, Kenda Area.
P.O:- Kenda , Dist: - Burdwan.
Pin:-713342. West Bengal

UNDERTAKING

Information provided in half yearly EC compliance report for the period October'23 to March'24 in respect of the following mines of Cluster no. 11 is true to the best of my knowledge:

SL NO.	MINES	NAME OF THE MANAGER	SIGNATURE OF THE MANAGER
1.	New Kenda (UG)	DEBDAS HAZRA.	
2.	W kenda OC Patch		
3.	New Kenda OC mine		

23.4.2024.

Agent
(New Kenda Group of Mines)

EASTERN COAL FIELDS LIMITED
A subsidiary of Coal India Limited.
Office of the Agent
Chora Haripur Group of Mines, Kenda Area.
P.O:- Haripur, Dist: - Burdwan.
Pin:-713378. West Bengal

UNDERTAKING

Information provided in half yearly EC compliance report for the period October'23 to March'24 in respect of the following mines of Cluster no. 11 is true to the best of my knowledge:

SL NO.	MINES	NAME OF THE MANAGER	SIGNATURE OF THE MANAGER
1.	Krishnagar(OC)		
2.	Haripur group of Mines		
i)	Haripur (UG + OC)	MANOJ KUMAR	
ii)	Chora 10 pit(UG)	ASHIS KAYAL	22.4.24
iii)	Chora 7,9 pit(UG)	SHIVRAJ SHELKE	22.4.24

Agent 22/04/2024
(Krishnanagar/Haripur(UG+OC)/Chora 7,9 pit/Chora 10 pit)

EASTERN COAL FIELDS LIMITED
A subsidiary of Coal India Limited.
Office of the Agent
CBI/Shankarpur OC Patch/Bonbahal OC, Kenda Area.
P.O:- Bahula , Dist: - Burdwan.
Pin:-713322. West Bengal

UNDERTAKING

Information provided in Half yearly EC compliance report for the period October'23 to March'24 in respect of the following mines of Cluster no. 11 is true to the best of my knowledge:

SL NO.	MINES	NAME OF THE MANAGER	SIGNATURE OF THE MANAGER
1.	CBI(UG)	BANSHI RAM	19/04/24
2.	Bonbahal OC Patch		
3.	Shankarpur OC Patch		

19/04/2024

Agent
(CBI (UG)/ Bonbahal OC Patch/ Shankarpur OC Patch mines)

EASTERN COAL FIELDS LIMITED
A subsidiary of Coal India Limited.
Office of the Agent
Lower Kenda & Bahula , Kenda Area.
P.O:- Bahula , Dist: - Burdwan.
Pin:-713322. West Bengal

UNDERTAKING

Information provided in Half yearly EC compliance report for the period October'23 to March'24 in respect of the following mines of Cluster no. 11 is true to the best of my knowledge:

SL NO.	MINES	NAME OF THE MANAGER	SIGNATURE OF THE MANAGER
1.	Lower Kenda (UG)	Tarun Kumar Banerjee	
2.	Bahula (UG)	ARBIND KUMAR	

24.09.24

Agent
(Bahula & Lower Kenda Mines)

EASTERN COALFIELDS LIMITED
(A Subsidiary of Coal India Limited)
Office of the Agent
Shankarpur Colliery

P.O. Ukhra
District : Paschim Burdwan
West Bengal-713363
CIN: U10101WB1975GOI030295
Ph.: No. 0341-2665491/492/493/494
Fax No. 0341-2665366

Ref:- SKP/AGT/024/55 Dt:- 23/5/24

UNDERTAKING

Information provided in Half-yearly EC compliance report for the period October'23 to March'24 in respect of the Shankarpur UG of Cluster No. 11 is true to the best of my knowledge:

23/05/2024
Agent
Shankarpur Colliery

23/5/24
Manager
Shankarpur Colliery

EASTERN COALFIELDS LIMITED
(A Subsidiary of Coal India Limited)
Office of the Agent
Khandra Colliery

P.O. Ukhra
District : Paschim Burdwan
West Bengal-713363
CIN: U10101WB1975GOI030295
Ph.: No. 0341-2665491/492/493/494
Fax No. 0341-2665366

Ref No:- KC/Agt/Env/2024-25/1081 Dt - 17/05/2024

UNDERTAKING

Information provided in Half-yearly EC compliance report for the period October'23 to March'24 in respect of the Khandra UG of Cluster No. 11 is true to the best of my knowledge:

Agent
Khandra Colliery
17/05/2024

Manager
Khandra Colliery
17/5/24

Specific conditions

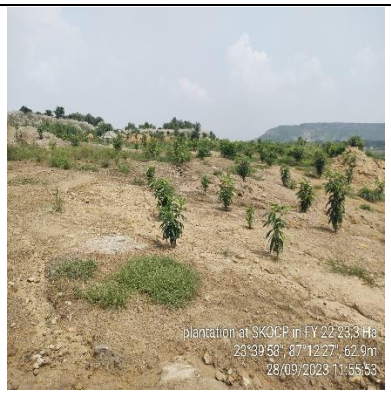
Condition no.(i)	The Maximum production from the mine at any given time shall not exceed the limit as prescribed in the EC.
Compliance	Complied

S.No	Name of Mines	Peak EC Capacity (MTPA)	Production FY:2023-24 (Te)
1	Krishnanagar (OC)	0.50	0
2	Haripur Group of Mines	2.30	
A	Haripur(U/G + OC)	-	_
B	CBI(U/G)	0.10	29921.00
C	Chora 7,9 & 10 pit(U/G)	0.21	1,05,303.71
D	Bonbahal OC Patch(OCP)	0.31	148340.650
E	Shankarpur/CL Jambad OC Patch/Mine(52 Ha)	0.8	98670.00
3	New Kenda Group of Mines	2.00	
A	New Kenda (UG)	0.05	0
B	West Kenda OC Patch/Mines	0.75	Not yet started.
C	New Kenda OC mine(240 Ha)	1.2	622133.510
4	Bahula Group of Mines	1.36	
A	Lower Kenda(U/G)	0.15	47774.760
B	Bahula (U/G)	0.25	48564.300
C	CL Jambad (U/G+OC)	0.96	31639.95
5	Siduli(U/G +OC)	2.32	51115
6	Khandra UG	0.1	91425
7	Shankarpur UG	0.5	191217

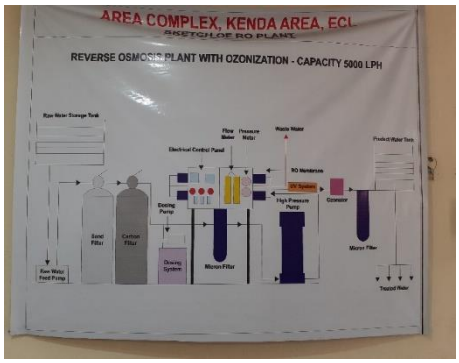
Condition(ii)	The validity of the EC is for the life of mine or as specified in the EIA Notification, 2006 whichever is earlier.
Compliance	Agreed.
Condition(iii)	The socio economic study conducted by PP needs to be authenticated by an institute of repute such as Indian institute of forest Management /XLRI, Jamshedpur.
Compliance	Complied.
Condition (iv)	All safety measures shall be taken as per CMR, 1957 & related circulars.
compliance	All safety measures are being taken as per CMR- 1957 & related Circulars.
Condition(v)	The production shall be within mining lease area.
Compliance	The production is within the same Mining lease.
Condition(vi)	The loading system from Continuous Miner to Mine Car needs to be improved to utilize the continuous miner efficiently.
Compliance	There is no continuous miner in cluster No.11.
Condition(vii)	There shall be no external dump and mine voids at the end of mining. The land shall be brought back the surface level for agricultural use.
compliance	The backfilling is being done as per mine closure plan and after technical reclamation, biological reclamation is being done as per MCP.
Condition(viii)	Controlled blasting in all the mines to be resorted to.
compliance	Controlled blasting is practiced in all the mines
Condition(ix)	Till the OB dump is re-handled, it shall be covered with grass cover.
compliance	Agreed.
Condition(x)	Suitable garland drains and settling tank be provided.
compliance	Garland drains have been provided wherever is required.

	 (Garland drains at C L Jambad)  (Settling tank at SKOCP)
Condition(xi)	Socio-economic study to be carried out in order to establish the necessity of mining on New Kenda OC Patch. Presently, EC is recommended to the cluster without New Kenda OCP.
compliance	Complied.
Condition(xii)	Coal transportation shall be: in pit underground mine-coal tubs at the faces are being hauled by Tugger Haulage; opencast mine-coal at surface is transported to the nearby coal depot by dumpers through tipplers, surface to siding by dumpers.
compliance	Complied. Coal transportation in underground mine-coal tubs at the faces are being hauled by Tugger Haulage; opencast mine-coal at surface is transported to the nearby coal depot by dumpers through tipplers, transportation from depot to siding is done by dumpers/trucks/tippers.
Condition(xiii)	Independent network of railway sidings inside the cluster to be developed and should be constructed at the earliest till then proponent may use mechanically covered trucks for transportation of coal.
compliance	There are currently three (3) railway sidings – Bahula, Bankola I & Bankola II and POCP-II siding in Cluster 11. Coal is transported to railway sidings from the mines outlet by dedicated black-topped road especially constructed for the purpose. Coal transportation from mine to siding is done through tarpaulin covered trucks.
Condition(xiv)	Three tier green plants shall be raised around the railway sidings and along the road side to prevent dust and noise pollution.
compliance	Three tier plantations will be done along the road side as per the availability of land. However, Plantation along Bahula railway sidings have been done. Some trees have been planted along Bahula Railway sidings.

	  (Plantation at Bahula Railway Siding).
Condition(xv)	Stowing and depillaring shall be as per the recommendations of the DGMS.
Compliance	Stowing and depillaring is being done as per recommendations of the DGMS.
Condition(xvi)	The proponent must comply with the Raniganj Action Plan .The unstable area within the cluster will be brought under the plantation after the population residing over these areas is rehabilitated under the Master Plan for Raniganj Coalfields to be implemented by ADDA.
Compliance	Job is being implemented by ADDA. The rehabilitation of inhabitants residing at unstable location siduli village and kenda village will be done by ADDA under Raniganj Master Plan. In case of New Kenda, 4.83 Acre of Land is handed over to ADDA.
Condition(xvii)	Trees with deep rooted system such as Neem, Seemul, Karanch, Shisham, Arjun, Babool & Sirish should be planted so as to prevent soil erosion.
Compliance	Native deep rooted species are being planted.
Condition(xviii)	Proponent should plant additional 10 Ha/year over the next 10 years at various locations in the cluster.
Compliance	In 2015-16(10 Ha plantation), In 2016-17(16 Ha plantation), In 2018-19 (3 Ha Plantation), In FY 2019-20 (9 Ha Plantation), In FY 2020-21(4.5 Ha Plantation), In FY 2021-22(6.48 Ha), In 2022-23(4.2 Ha),In FY 2023-24(4.07 Ha) of plantation in Kenda Area under cluster 11. The details of plantation are as follows: - 1. OB Dump Area------14 Ha (10 Ha in FY 2015-16 & 4 Ha in FY 2016-17). 2. Backfilled Area------3 Ha(in FY 2016-17). 3. Others----------9 Ha (in FY 2016-17). 4. Backfilled Area-----3 Ha (in FY 2018-19). 5. Internal OB Dump Area-----7.5 Ha (in FY 2019-20) 6. Plain land & OB Dump---1.5 Ha(in FY 2020-21) 7. Plain land & OB Dump---6.48 Ha(in FY 2021-22) 8. Plain Land & OB Dump---4.2 Ha(in FY 2022-23) 9. Plain Land & Internal OB Dump---4.07 Ha(In FY 23-24)

	  **(Plantation created in FY 2022-23 under Kenda Area(ECL).**   **(Plantation created in FY 20-21 under Kenda Area(ECL).**   **(Plantation created in FY 2023-24)**
Condition(xix)	Rivers/nallahs shall be desilted and restored back to functional state.
Compliance	There is no siltation from the mine into Rivers/Nallahs. However, cleaning of nallahs is an annual pre monsoon activity in each mine of the cluster.
Condition(xx)	Wildlife conservation plan be prepared and submitted to MOEFCC with the approval of the state Govt.
Compliance	Wildlife conservation plan of entire Raniganj coalfield has been prepared and submitted to West Bengal Forest Department for vetting.
Condition(xxi)	Proponent shall use high resolution image of all clusters for evaluating land use, plantation etc.

Compliance	Land use pattern and plantation is being monitored by satellite surveillance based on satellite imagery. **(The satellite surveillance report of the year 2022 is attached herewith)**
Condition(xxii)	Separate drainage pattern be provided.
Compliance	Separate drainage has been provided as per requirement.
Condition(xxiii)	Sand stowing must be used as recommended by CMPDI.
Compliance	Sand stowing is being used as recommended by CMPDIL.
Condition(xxiv)	Action plan for prevention and mitigation of subsidence be prepared and implemented.
Compliance	No underground mining is carried out below within 45m of the Major Roads, Railway line and nallah flowing through the cluster. Coal pillars are left intact vertically below and within the angle of draw of villages and other surface features. Depillaring is done with sand stowing. The mining method adopted in consultation with DGMS and their approval.
Condition(xxv)	The OC Patch to be operated will be completely filled-up after exhaustion of reserves and reclaimed with plantation.
Compliance	The OC Patch to be operated is being filled up as per approved mine closure plan and at the end of technical reclamation, Biological reclamation will be done as per Approved mine closure plan.
Condition(xxvi)	After completion of mining activities, the subsided areas shall be graded and planted upon.
Compliance	Agreed.
Condition(xxvii)	Coal Extraction shall also be optimized in areas where agricultural is continuing. Some pillars shall be left below the agricultural land. No depillaring & coal extraction should be carried out below habitation, H.T lines & beneath road, water bodies.
Compliance	Coal Extraction is being carried out as per DGMS permissions and guidelines.
Condition(xxviii)	Water discharged from the mine should be as good as surface drinking water.
compliance	The Mine water is fortnightly tested for parameters namely pH, TSS, TDS, Oil and Grease and COD and conforms to MoEF Schedule-VI standards.**(Monitoring Reports enclosed herewith).** In Kenda area, Water treatment plant (having pressure filter and chlorination unit) at Bahula Colliery, Siduli colliery, New Kenda Colliery, Lower Kenda , C L Jambad, Chora 7,9 Pit have been installed. Two R.O plant,One at Kenda Area Complex and another at Regional Hospital Chora had been installed under Kenda Area (ECL). under CSR, One water treatment filter plant had been installed at New Kenda Colony. At Bankola Area, mine discharge water is being treated in Slow Sand Filter – 1 unit each at Khandra Colliery, and Area Complex.

	Reverse Osmosis Plant – 1 unit each Khandra Colliery, Shankarpur Colliery.    **(R.O Plant at Kenda Area Complex).**   R.O Plant at Regional Hospital Chora   **(Pressure filter Plant at C L Jambad Colliery)**
Condition(xxix)	Regular monitoring of subsidence movement on the surface over and around the working area and impact on natural drainage pattern, water bodies, vegetation, structure, roads, surroundings, shall be continued till movement ceases completely.

	In case of observation of high rate of subsidence movement, appropriate effective corrective measure shall be taken to avoid loss of life and material. Cracks shall be effectively plugged with blast and clayey soil/suitable material.
compliance	Regular inspection is being done by the pit safety committee headed by Safety Officer on the surface over and around the working area for any sign of subsidence.
Condition(xxx)	If subsidence is found exceeding the permitted limits, then the landowner shall be adequately compensated with mutual agreement of the landowners.
compliance	Agreed.
Condition(xxxi.)	Water sprinkler system shall be provided to check fugitive emissions from loading operations, conveyor system, haulage roads, transfer points etc. Major approach roads shall be black topped and properly maintained.
compliance	The coal transportation roads from colliery to Railway Siding are black topped and Water Sprinkling is being done on the approach road with Mobile Water tankers.21 Nos. of fixed type sprinkler has been installed along Bahula railway sidings under Kenda Area . Also, water spraying arrangement have been provided at each coal depot.  (Fixed type sprinklers at Bahula Railway Siding)  Spraying arrangement at Coal Crusher Also, Regular sprinkling of water is carried out over the surface through fixed and mobile sprinklers to check fugitive emissions at Railway Siding, Fixed water sprinklers (22 nos) have been installed at Bankola I and Bankola II Railway Sidings.

<table>
<tr><td>Condition(xxxii)</td><td>The CSR cost should be Rs 5 per tonnes of coal produced which should be adjusted as per the annual inflation.</td></tr>
<tr><td>compliance</td><td>As per the CSR policy of CIL 2% of the average profit of preceding 3 years is the norm for CSR expenditure in the entire ECL command areas.
CSR expenditure for FY 2023-24 for Bankola Area is 2.27 lac.
The CSR Activity, Expenditure details in FY 2023-24 are given: -
<table>
<tr><th>Sl.No.</th><th>Name of the activity</th><th>Project Cost(In Rs. Lakh)</th><th>Location</th><th>Remark</th></tr>
<tr><td>1.</td><td>Installation of 442 Nos of Solar LED Lights in Chora and Kenda Panchayet</td><td>40.22 Lakh</td><td>Chora and Kenda Panhayat</td><td>NA</td></tr>
<tr><td>2.</td><td>Implementation of Mobile Medical Van in Villages under Kenda Area Bahula, CL Jambad, Chakdola, Khas Kenda, Kenda, Pure Jambad</td><td>-</td><td>C L Jamabd, Bahula, Khas kenda etc.</td><td>NA</td></tr>
</table>

(Solar Street Light)</td></tr>
</table>

<table>
<tr><td></td><td> 

(Mobile Medical Van Programme)</td></tr>
<tr><td>Condition(xxxiii)</td><td>The mining in the existing mines should be phased out after expiry of the current mining lease and after reclamation of the mines over area. The operating mine may be analyzed and monitored for compliance of conditions, bearing with movement of wildlife and until such time they are closed /phased out.</td></tr>
<tr><td>compliance</td><td>Agreed.</td></tr>
<tr><td>Condition(xxxiv)</td><td>Everybody in the core area is being provided with mask for protection against fugitive dust emissions as on when required basis.</td></tr>
<tr><td>compliance</td><td>In order to provide protection against fugitive dust emission, dust masks are being provided to people working in the core area.</td></tr>
<tr><td>Condition(xxxv)</td><td>Dust mask to be provided to everyone working in the mining area.</td></tr>
<tr><td>compliance</td><td>Dust mask is being provided to everyone working in the mining area as on when required basis.</td></tr>
<tr><td>Condition(xxxvi)</td><td>The supervisory staff should be held personally responsible for ensuring compulsory regarding wearing of dust mask in the core area.</td></tr>
<tr><td>compliance</td><td>Supervisory staff ensures compulsory wearing of the dust masks in the core area.</td></tr>
<tr><td>Condition(xxxvii)</td><td>People working in the core area should be periodically tested for the lung diseases and the burden of cost on account of working in the coal mine area.</td></tr>
<tr><td>compliance</td><td>20 % of the work force is covered under periodic medical examination each year including lung diseases the cost of which is borne by the company. Total no. of person which has gone through PME in the FY 2023-24 from October'2023 to March'2024 is given below: -
<table>
<tr><th>Name of the Area</th><th>Month</th><th colspan="2">PME achievement for the Month (Nos. of Person)</th></tr>
<tr><th rowspan="2">Kenda Area</th><th rowspan="2"></th><th>ECL Employees</th><th>Contractual worker</th></tr>
<tr><td>October'2023</td><td>22</td><td>1</td></tr>
<tr><td></td><td>November'2023</td><td>2</td><td>0</td></tr>
<tr><td></td><td>December'2023</td><td>21</td><td>0</td></tr>
</table></td></tr>
</table>

		January'2024	**60**	**1**	
		February'2024	**105**	**3**	
		March'2024	**76**	**22**	
	Total		**286**	**27**	

Condition(xxxviii)	The mining area should be surrounded by green belt having thick closed thick canopy of the tree cover.
Compliance	Noted and Agreed.
Condition(xxxix)	Besides carrying out periodic health checkup of their worker,10 % of the worker identified from workforce engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any, through an specialized agency /institution within the District/State and the results reported to this ministry and to DGMS.
compliance	PME is being carried out for all employees once in every 5 years (@ 20% employees/year). Special cases diagnosed during such PMEs are monitored at shorter intervals as directed by the PME Board of Doctors. All serious diseases and impairments are reported to DGMS at regular intervals. Also, occupational health study has been conducted by NIOH for 10 % of the workers identified from workforce engaged in active mining operations. Total no. of person which has gone through PME in the FY 2023-24 from October'2023 to March' 2024 is given below: -

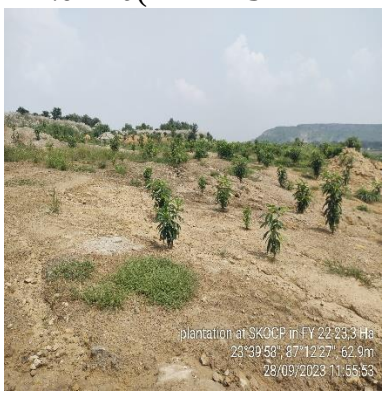
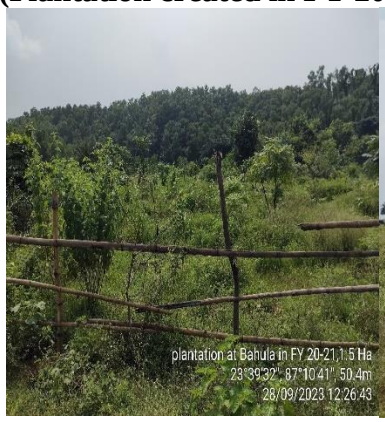
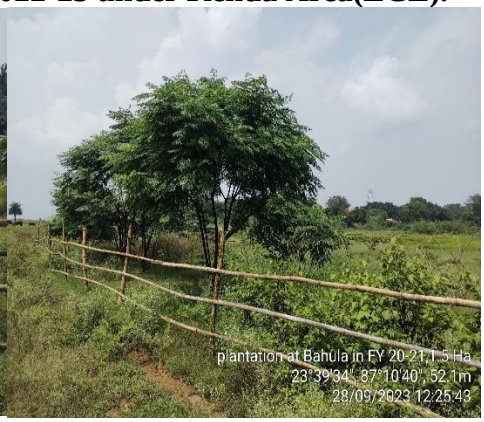
Name of the Area	**Month**	**PME achievement for the Month (Nos. of Person)**	
Kenda Area		**ECL Employees**	**Contractual worker**
	October'2023	**22**	**1**
	November'2023	**2**	**0**
	December'2023	**21**	**0**
	January'2024	**60**	**1**
	February'2024	**105**	**3**
	March'2024	**76**	**22**
Total		**286**	**27**

Condition(xl)	The embankment constructed along the river boundary shall be of suitable dimensions and critical patches shall be strengthened by stone pitching on the river front side and stabilized with plantation so as to withstand the peak water flow and prevent mine inundation.
compliance	Not applicable as there is no river within the mine leased area of the colliery.

Condition(xli)	There shall be no overflow of OB into the river and into the agricultural fields and massive plantation of native species shall be taken up in the area between the river and the project.
compliance	There is no river in the cluster.
Condition(xlii)	Catch drains and siltation ponds of appropriate size shall be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected shall be utilized for watering the mine area, roads, green belt development, etc. The drains shall be regularly desilted and maintained properly. Garland drains (size, gradient, length) and sump capacity shall be designed keeping 50 % safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity shall also provide adequate retention period to allow proper settling of silt material.
Compliance	Permanent masonry drains of size range 200 to 600 m, 0.90 m to 2 m and 0.6 m to 2 m depth and 1 in 30 gradients, depending on the catchment have been constructed for evacuation of rain water. The size of the drain is large enough to take care of heavy downpours. The drain is cleared of debris before the start of the monsoon season as part of our annual monsoon preparation program. Catch drains and siltation ponds have been provided at the toe of the dumps wherever required.  (Photograph of Catch drain/Garland drain at C L Jambad OCP)
Condition(xliii)	Garland drains (size, gradient, and length) around the safety areas such as mine shaft and low lying areas and sump capacity shall be designed keeping 50 % safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity shall also provide adequate retention period to allow proper settling of silt material.
Compliance	Width of garland drains are kept at 0.90 m while depth of the drain varies from 0.6 m to 1.5 m depending on the catchment and gradient of the drain. Garland drains, wherever required, are maintained and required sump capacity is also maintained in the mine. Catch drains are being maintained properly & cleaning is being done regularly according to the monsoon preparation plan.

Condition(xliv)	Dimension of the retaining wall at the toe of dumps and OB benches within the mine to check runoff and siltation shall be based on the rainfall data.
Compliance	To check runoff and siltation, proper benching in dump is being done while maintaining slope stability. Regular Plantation on OB dumps is being done to stabilize the dumps.
Condition(xlv)	Crushers at the CHP of adequate capacity for the expansion project shall be operated with high efficiency bag filters, water sprinkler system shall be provided to check fugitive emissions from crushing operations, conveyor system, haulage roads, transfer points etc.
compliance	Water spraying arrangement have been provided at Coal Crusher to arrest fugitive emissions from crushing operations. Apart from that, fixed type sprinkler has been installed along Bahula railway siding.  (Fixed type sprinkler at Bahula Railway Siding)
Condition(xlvi)	Mine discharge water outside the ML shall be monitored, particularly for TDS, and treated to conform to prescribed levels before discharge into natural environment.
compliance	Complied. Mine water discharge quality complies with prescribed standards. Regular monitoring is done by CMPDIL. The quality of mine water is within permissible limits. Mine water quality report are enclosed. **(Monitoring Reports enclosed herewith).**
Condition(xlvii)	Drills shall be wet operated.
compliance	Water spraying is done for dust suppression before drilling in the mines.
Condition(xlviii)	The project authority shall undertake regular repairing and tarring of roads used for mineral transportation. A 3-tier green plants comprising of a mix of native species shall be developed all along the major approach roads.

compliance	As per requirement, Regular repairing and tarring of roads are taken up.   (Road repaired and new concrete road made at Bahula Siding under Kenda Area(ECL)
Condition(xlix)	Controlled blasting shall be practiced with use of delay detonators and only during day time. The mitigative measures for control of ground vibrations and to arrest the fly rocks and boulders shall be implemented.
compliance	Complied. Controlled blasting is being done as per DGMS permission and conditions.
Condition(l.)	A progressive afforestation plan shall be implemented covering an area of 845.59 ha at the end of mining, which includes reclaimed eternal OB dump area (142.34 Ha);internal OB dump area(408 ha);green belt(295.25 ha) in township located outside the lease by planting native species in consultation with the local DFO/Agricultural Department .the density of the trees shall be around 2500 plants per Ha .Massive plantation shall be carried out in open spaces in and around the mine and a 3-tier avenue plantation along the main approach roads to the mine.

Compliance	In 2015-16(10 Ha plantation), In 2016-17(16 Ha plantation), In 2018-19 (3 Ha Plantation), In FY 2019-20 (9 Ha Plantation), In FY 2020-21(4.5 Ha Plantation), In FY 2021-22(6.48 Ha), In 2022-23(4.2 Ha),In FY 2023-24(4.07 Ha) of plantation in Kenda Area under cluster 11. The details of plantation are as follows: - 1. OB Dump Area------14 Ha (10 Ha in FY 2015-16 & 4 Ha in FY 2016-17). 2. Backfilled Area------3 Ha(in FY 2016-17). 3. Others----------9 Ha (in FY 2016-17). 4. Backfilled Area-----3 Ha (in FY 2018-19). 5. Internal OB Dump Area-----7.5 Ha (in FY 2019-20) 6. Plain land & OB Dump---1.5 Ha(in FY 2020-21) 7. Plain land & OB Dump---6.48 Ha(in FY 2021-22) 8. Plain Land & OB Dump---4.2 Ha(in FY 2022-23) 9. Plain Land & Internal OB Dump---4.07 Ha(In FY 23-24   **(Plantation created in FY 2022-23 under Kenda Area(ECL).**   **(Plantation created in FY 20-21 under Kenda Area(ECL).**   **(Plantation created in FY 2023-24)**

Condition(li)	The proponent should prepare restoration and reclamation plan for the degraded area. The land be used in a productive and sustainable manner.
Compliance	Mine closure Plan has already been prepared for the purpose. Restoration and reclamation shall be done accordingly. In this regard, one park at Bahula Colliery has already been made. Also, one park at Chora Block Incline colliery has been made.  (Park/Garden at bahula Colliery)   (park at CBI Colliery)

<table>
<tr><td>Condition (lii.)</td><td>Compensatory Ecological and restoration of waste land, other degraded land and OB dumps in lieu of breaking open the land be carried out.</td></tr>
<tr><td>Compliance</td><td>Mine closure Plan has already been prepared for the purpose. Compensatory ecological and restoration of wasteland shall be done accordingly. The details of plantation at different location in Kenda Area inside the cluster is given below: -
1. OB Dump Area------17 Ha (10 Ha in FY 2015-16 & 4 Ha in FY 2016-17).
2. Backfilled Area------3 Ha (in FY 2016-17).
3. Others----------9 Ha (in FY 2016-17), 1.5 Ha (in FY 2020-21),2.2 Ha (FY 2021-22)
4. Backfilled Area-----3 Ha (in FY 2018-19).
5. Internal OB Dump Area-----7.5 Ha (In FY 2019-20), 3 Ha (FY 2021-22)
6. 3 Tier Avenue--------1.28 Ha (in FY 2021-22)
7. Miscellaneous & Orchard---4.2 Ha (In FY 2022-23).
8. Orchard----------4.07 Ha(In FY 2023-24)</td></tr>
<tr><td>Condition(liii)</td><td>No ground water shall be used for mining operations.</td></tr>
<tr><td>Compliance</td><td>No ground water is being used for mining operations.</td></tr>
<tr><td>Condition(liv)</td><td>An estimated total 258.26Mm3 of OB will be generated during the entire life of the mine. OB will be dumped in four internal dumps covering an area of 408 Ha of land. The OB dump height is up to 60m.the minimum slope of the dump shall not exceed 28 degrees. Monitoring and management of reclaimed dump site shall continue till the vegetation becomes self-sustaining and compliance status submitted to MOEF & CC and its regional office on yearly basis.</td></tr>
<tr><td>Compliance</td><td>Agreed.</td></tr>
<tr><td>Condition(lv.)</td><td>Of the total quarry area 408 Ha the backfilled quarry area of (408 Ha) shall be reclaimed with plantation by planting native plant species in consultation with the local DFO /Agricultural department The density of the trees shall be around 2500 Plants per Ha.</td></tr>
<tr><td>compliance</td><td>Agreed. In FY 2015-16, 2016-17, 2018-19, 2019-20, FY 2020-21, FY 2021-22, FY 2022-23,FY 23-24, Total 52.55 Ha plantation has been done at different location in kenda area with the help of Forest Department. The details of Plantation is given below: -
<table>
<tr><td>Year</td><td>Name of Species</td><td>Area in Ha</td><td>No. of Saplings</td><td>Density</td></tr>
<tr><td>2015-16</td><td>Kadam,Pepal,Sonajuri,Jamun,Amla etc.</td><td>10 Ha</td><td>25000</td><td>2500/ha</td></tr>
</table></td></tr>
</table>

2016-17	Neem,Karanj,Sisoo,Chatim etc.	16 Ha	40000	2500/ha	
2018-19	Neem,Karanj,Sisoo,Chatim etc.	3 Ha	7500	2500/ha	
2019-20	Chatim,Karanj, Palash, Jarul etc.	7.5 Ha	18750	2500/ha	
2020-21	Karanj,karam,Arjun,bahera etc.	1.5 Ha	3750	2500/Ha	
2021-22	Mixed species & 3 tier Avenue	6.28 Ha	15048	2500/Ha & 1600/Ha(Avenue Plantation.	
2022-23	Miscellaneous and Orchard	4.2 Ha	8925	2500/Ha & 400/Ha(0.75)	
2023-24	Orchard	4.07 Ha	1710	420/Ha(Orchard Plantation)	

Condition(lvi.)	Regular monitoring of groundwater level and quality shall be carried out by establishing a network of existing wells and construction of new piezometers. the monitoring for quality shall be done four times a year in pre-monsoon(May), Monsoon (August), post monsoon(November) and winter(January) seasons and for quality in May. Data thus collected shall be submitted to Ministry of Environment, Forests and climate change and to central pollution control board quarterly within one month of monitoring.
compliance	One piezometer at New Kenda Colliery have been installed**.** Piezometer Water Table Monitoring report is enclosed herewith **(Monitoring Report enclosed herewith).**

	  (**Photograph of Piezometer at New Kenda Colliery under Kenda Area(ECL)).**
Condition(l vii)	The company shall put up artificial groundwater recharge measures for augmentation of ground water resource in case monitoring indicates a decline in water table. The project authority shall meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.
compliance	Rain water Harvesting structure have been installed at Kenda Area office and Regional Hospital Chora. The mine discharge is effectively being utilized to meet the domestic demands of the community thus reducing the strain on ground water resources.   (Rain water harvesting at Kenda Area office)  

	(Rain water harvesting at Chora Hospital)
Condition(l viii)	Sewage treatment plant shall be installed in the existing colony. ETP shall also be provided for workshop and CHP waste water.
compliance	Washing platform along with ETP at Shankarpur OCP has been installed at SKOCP. For STP (Sewage Treatment Plant) at New Kenda Colony, Work has been completed and it is running.     (STP at New Kenda Colony at Kenda Area(ECL))  (Oil and Grease Trap at Siduli Colliery)

<table>
<tr><td>Condition(lviv)</td><td>Land oustees shall be compensated as per the norms laid out R & R policy of CIL or the National R& R policy or R & R policy of the state government whichever is higher.</td></tr>
<tr><td>Compliance</td><td>If required, Land oustees shall be compensated as per the norms laid out in R & R Policy of CIL.</td></tr>
<tr><td>Condition(lvv)</td><td>For monitoring land use pattern and for post mining land use, a time series of land use maps, based on satellite imagery (on a scale of 1:5000) of the core zone and buffer zone, from the start of the project until the end of mine life shall be prepared once in 3 years (for any one particular season which is consistent with time series), and the report submitted to MOEF&CC and its concerned regional office.</td></tr>
<tr><td>Compliance</td><td>For monitoring land use pattern and for post mining land use, a time series of land use maps, based on satellite imagery are prepared once in 3 years by CMPDIL.</td></tr>
<tr><td>Condition(lvvi)</td><td>A detailed final mine closure plan along with details of corpus fund shall be submitted to the Ministry of Environment, Forest & Climate Change within 6 months of grant of EC.</td></tr>
<tr><td>Compliance</td><td>Complied.
MCP for all collieries have been prepared.</td></tr>
<tr><td>Condition(lvvii)</td><td>The project authority shall in consultation with the Panchayats of the local villages and administration identify socio-economic and welfare measures under CSR to be carried out over the balance of the mine.</td></tr>
<tr><td>Compliance</td><td>Agreed and it is being Complied.
The CSR Activity, Expenditure details in FY 2023-24 are given: -
<table>
<tr><th>Sl.No.</th><th>Name of the activity</th><th>Project Cost(In Rs. Lakh)</th><th>Location</th><th>Remark</th></tr>
<tr><td>1.</td><td>Installation of 442 Nos of Solar LED Lights in Chora and Kenda Panchayet</td><td>40.22 Lakh</td><td>Chora and Kenda Panhayat</td><td>NA</td></tr>
<tr><td>2.</td><td>Implementation of Mobile Medical Van in Villages under Kenda Area Bahula, CL Jambad, Chakdola, Khas Kenda, Kenda, Pure Jambad</td><td>-</td><td>C L Jamabd, Bahula, Khas kenda etc.</td><td>NA</td></tr>
</table></td></tr>
</table>

	 (Solar Street Light)  (Mobile Medical Van Programme)
Condition(lvvii)	Corporate Environment Responsibility: a) The Company shall have a well laid down Environment Policy approved by the Board of Directors. b) The Environment Policy shall prescribe for standard operating process/procedures to bring into focus any infringements/ deviation /violation of the environmental or forest norms/conditions. c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions shall be furnished. d) To have proper checks and balances, the company shall have a well laid down system of reporting of non-compliances /violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.
Compliance	Agreed and being complied with.

General Conditions

Condition(i)	No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment, Forests & Climate Change.

Compliance	Complied. Change in mining technology and scope of working, if any, is being made with prior approval of the Ministry of Environment, Forests & Climate Change.
Condition(ii)	No change in the calendar plan of production for quantum of mineral coal shall be made.
Compliance	Noted and agreed.
Condition(iii)	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM 10, PM 2.5, SO2,NO monitoring. Locations of the stations shall be decided based on the meteorological data, topographical features, and environmentally and ecologically sensitive targets in consultation with state pollution control board. Monitoring of heavy metals such as HgAs, Ni,Cd, Cr etc carried out atleast once in six months.
Compliance	Air quality monitoring is carried out by CMPDIL on every fortnight and all desired parameters are well within the prescribed limits. Ambient air quality report are enclosed.**(Monitoring Report enclosed herewith).**
Condition(iv)	Data on ambient air quality (PM10,PM2.5,SO2,and NO) and heavy metals such as Hg,As,Ni,Cd,Cr and other monitoring data shall be regularly submitted to the ministry including its concerned Regional office and to the state pollution control board and the central pollution control board once in si months .Random verification of sample through analysis from independent laboratories recognized under EPA rules,1986 shall be furnished as part of compliance report.
Compliance	Air quality monitoring is carried out by CMPDIL on every fortnight and all desired parameters are well within the prescribed limits. Ambient air quality report are enclosed.**(Monitoring report enclosed herewith).**
Condition(v)	Adequate measure shall be taken for control of noise level below 85 (dBA) in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with ear plugs/muffs.
Compliance	Noise level monitoring is carried out by CMPDIL on fortnightly basis. Noise Data are enclosed. **(Monitoring report enclosed herewith).**
Condition(vi)	Industrial wastewater (waste water and workshop from the mine) shall be properly collected, treated so as to conform to the standards conform to the standards prescribed under GSR 422€ dated 19th May 1993 and 31st December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.
Compliance	Water discharged from the mine are tested in laboratory at CMPDI on fortnightly basis and found conforming to the MoEF schedule VI standards for discharge of effluents. Reports are enclosed.**(Monitoring report enclosed**

	herewith). Work has been completed for construction of washing platform along with ETP at SKOCP. Also, Oil and Grease trap have been installed at siduli Colliery.  (Oil and Grease Trap at Siduli Colliery)
Condition(vii.)	Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transporting the minerals shall be covered with the tarpaulins and optimally loaded.
Compliance	Vehicular emissions are kept under control and regularly monitored. Coal transportation from the mine to railway siding is being done by tarpaulin covered trucks.
Condition(viii.)	Monitoring of environmental quality parameters shall be carried out through establishment of adequate number and type of pollution monitoring and analysis equipment in consultation with state pollution control board and data got analysed through a laboratory recognized under EPA Rules, 1986 .
Compliance	Monitoring of environmental parameters is carried out on regular basis by CMPDI. Laboratory at CMPDIL, Asansol is having all necessary facilities.
Condition(ix.)	Personnel working in dusty areas shall wear protective respiratory devices and they shall also be provided with adequate training on information on safety and health aspects.
Compliance	All protective devices have been provided to workmen and are replaced periodically. Adequate training to all personnel has also been provided. New recruits are trained at the VTC before their deployment. PMEs are carried out on all employees once in 5 years.
Condition(x.)	Occupational health surveillance programme of workers Shall be undertaken periodically to observe any contractions due to exposure due to dust and to take corrective measure, if needed and records thereof .the quality of environment due to outsourcing and the health and safety issues of the outsourced manpower should be addressed by the company while outsourcing.
Compliance	Complied.

<table>
<tr><td></td><td>Every year, 20% of the workforce is covered under occupational health surveillance programme in form of Periodical Medical Examinations. Total no. of person which have gone through the PME in FY 2023-24 from October'2023 to March'2024 is given below: -
<table>
<tr><th rowspan="2">Month</th><th colspan="2">PME achievement for the Month (Nos. of Person)</th></tr>
<tr><th>ECL Employees</th><th>Contractual worker</th></tr>
<tr><td>October'2023</td><td>22</td><td>1</td></tr>
<tr><td>November'2023</td><td>2</td><td>0</td></tr>
<tr><td>December'2023</td><td>21</td><td>0</td></tr>
<tr><td>January'2024</td><td>60</td><td>1</td></tr>
<tr><td>February'2024</td><td>105</td><td>3</td></tr>
<tr><td>March'2024</td><td>76</td><td>22</td></tr>
</table></td></tr>
<tr><td>Condition(xi)</td><td>A separate environmental management cell with suitable qualified personnel shall be setup under the control of a senior executive, who will report directly to the head of the company.</td></tr>
<tr><td>Compliance</td><td>Complied. A separate environmental management cell with qualified personnel has been established.</td></tr>
<tr><td>Condition(xii.)</td><td>The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose. Year wise expenditure shall be reported to this ministry and its concerned Regional office.</td></tr>
<tr><td>Compliance</td><td>Funds for environmental protection as kept in budget each year is not diverted for other purposes.it is being complied with.

As information provided from Finance Department, Expenditure details (tentative) in EMP Head in FY 23-24 at Kenda Area(ECL) are given below: -
<table>
<tr><td colspan="3">Revenue</td></tr>
<tr><td>Sl. No.</td><td>Head</td><td>Expenditure (In Rs. Lakh)</td></tr>
<tr><td>1.</td><td>Afforestation</td><td rowspan="2">31.81 Lakhs</td></tr>
<tr><td>2.</td><td>PCB Taxes and others</td></tr>
<tr><td colspan="3">Capital</td></tr>
<tr><td>1.</td><td>EMP Head</td><td>34.25 Lakhs</td></tr>
</table></td></tr>
</table>

Condition(xiii.)	The Project authorities shall advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular language of the locality concerned within seven days of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution control Board and may also be seen at the website of the Ministry of Environment, Forests & Climate Change at http://envfor.nic.in.
Compliance	Complied.
Condition(xiv.)	A copy of the environmental clearance letter shall be marked to concern Panchayat /Zila Parishad, Municipal Corporation or Urban local body and local NGO, if any, from whom any suggestion/representation has been received while processing the proposal. A copy of the clearance letter shall also be displayed on company's website.
Compliance	A copy of the environmental clearance letter for cluster 11 has been marked to concerned Panchayat / Zila Parishad, Municipal Corporation or Urban local body.
Condition(xv.)	A copy of the environmental clearance letter shall be shall also be displayed on the website of the concerned State Pollution Control Board. The EC letter shall also be displayed at the Regional Office, District Industry Sector and Collector's Office/Tehsildar's Office for 30 days.
Compliance	Agreed.
Condition(xvi.)	The clearance letter shall be uploaded on the company's website. The compliance status of the stipulated environmental clearance conditions shall also be uploaded by the project authorities on their website and updated at least once every six months so as to bring the same in public domain. The monitoring data of environmental quality parameter (air, water, noise and soil) and critical pollutant such as PM lO, PM25, S02 and NOx (ambient) and critical sectoral parameters shall also be displayed at the entrance of the project premises and mine office and in corporate office and on company's website.
Compliance	The monitoring data of environmental quality parameter (air, water and noise) and critical pollutant such as PM_{10}, $PM_{2.5}$, SO_2 and NOx (ambient) and critical sectoral parameters are being displayed on Company's website. Monitoring Reports are enclosed. **(Monitoring report enclosed herewith).**
Condition(xvii.)	The project proponent shall submit six monthly compliance reports on status of compliance of the stipulated environmental clearance conditions (both in hard copy and in e-mail) to the respective Regional Office of the Ministry, respective Zonal Offices of CPCB and the SPCB.
Compliance	Complied. The EC letter is uploaded on the company's website. The link is given below :www.easterncoal.gov.in

Condition (xviii.)	The Regional Office of the Ministry located in the Region shall monitor compliances of the stipulated conditions. The Project authorities shall extend full cooperation to the office(s) of the Regional Office by furnishing the requisite data/information/monitoring reports.
Compliance	Agreed.
Condition(xix)	The Environmental statement for each financial year ending 31 March in For -V is mandated to be submitted by the project proponent for the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be uploaded on the company's website along with the status of compliance of EC conditions and shall be sent to the respective Regional Offices of the MoEF CC by e-mail.
Compliance	Complied.

Additional Condition

Condition	The soil contamination through oil spillage/leakage should either be bio-remediated using specific technology available in the market, or sent to secured land fill facility authorized by the SPCB.
Compliance	Noted and Agreed.

Additional Condition

Condition(i)	Project Proponent shall obtain the necessary prior permission from the Central Ground Water Authority (CGWA) in case of intersecting the ground water table. The intersecting Ground water table can only be commenced after conducting detailed hydrogeological study and necessary permission from the CGWA. The report on six monthly basis on changes in Ground Water level and quality shall be submitted to the Regional Office of the Ministry, CGWA and State Pollution Control Board.
Compliance	Noted and Agreed.
Condition(ii)	No untreated mine water discharge shall be done in nearby Singaran and Tumni Nala.
Compliance	Being Complied.
Condition(iii)	PP Shall study the subsidence for the underground mine for enhanced area from recognized institute /Agencies and submit it to Ministry's Regional Office in six months from the date of issue of letter. Further, The recommendation in the study report shall implemented strictly.
Compliance	The work will be taken up in FY 24-25 as project is not started yet.

Condition(iv)	Third Party Monitoring (by NEERI/CIMFR/IIT) for air quality shall be carried out at identified locations, both ambient and the process area, to arrive at impact of the proposed changes. The report shall be submitted to Ministry's Regional office in six months.
Compliance	The work is under approval stage.
Condition(v)	Top soil should be stored separately at marked area.
Compliance	Top soil is being stored separately at marked area.
Condition(vi)	Active OB Dump should not be barren/Open and should be covered by temporary grass to avoid air born of particles.
Compliance	Regular plantation is being done at OB Dump area to avoid ar born of particles.
Condition(vii)	In active OB Dump shall not be kept barren/Open. They should be immediately reclaimed and re-graded to improve the land form and covered by Temporary Grass etc. for better land use post mining on closure.
Compliance	Noted and Agreed.
Condition(viii)	PP shall explore to use nearest coalmine in the cluster for backfilling instead of creating new external dump.
Compliance	Noted and Agreed.
Condition(ix)	Peripheral Tree Plantation around the affected villages like chinchuria, Chakdola, Chowkidanga, Kenda shall be done within two years.
Compliance	Regular plantation is being done depending upon the availability of Land.
Condition(x)	Project Proponent to plant 100,000 nos . of native trees with broad leaves along the transportation route in three years to prevent the effect of air pollution. After completion of Tree plantation, Number of trees shall be duly endorsed from District Forest Officer.
Compliance	Regular plantation is being done each year in consultation with DFO.
Condition(xi)	Fixed automatic sprinkler system shall be installed in crusher area, Haul Road. Further, adequate pollution control mechanism shall be adopted in mobile crusher system.

Compliance	Complied. Total 21 Nos of Fixed type sprinkler have been installed at Bahula Railway Sidings. Also, Regular water spraying is being done through mobile water tanker along the coal transport route.
Condition(xii)	Hon'ble Supreme Court in an Writ petition(s) Civil No. 114/2014,Common cause vs Union of India & Ors vide its Judgement dated 8th January,2020 has directed the union of India to impose a condition in the mining lease and a similar condition in the environmental clearance and the mining plan to the effect that the mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for the growth of fodder, flora, fauna etc. Compliance of this condition after the mining activity is over at the cost of the mining leaseholders/Project Proponent". The implementation report of the above said condition shall be sent to the Regional Offices of the MoEF&CC.
Compliance	Noted and Agreed.

ENVIRONMENT MONITORING REPORT OF CLUSTER NO. 11

(FOR THE MONTH OF MARCH, 2024)

(KENDA, SONEPUR BAZARI & BANKOLA AREA)

Eastern Coalfields Limited

Regional Institute-1
Asansol (WB)

CHAPTER - I
INTRODUCTION

1.0 The environmental monitoring has been carried out as per conditions laid down by MoEF&CC while granting environmental clearance to different projects. CMPDIL has trained manpower and well equipped laboratory to carry out monitoring, analysis and R&D work in the field of environment.

Reports have been prepared for submission to MoEF&CC, SPCB and other statutory authorities.

CHAPTER-II
AMBIENT AIR QUALITY MONITORING

2.0 Ambient air quality sampling stations: Ambient air quality monitoring stations have been classified in to residential and industrial based on their locations in different clusters of mines. The following sampling stations have been selected to monitor the ambient air quality in cluster no. 11:

i) **Chora pit no. 10 office, Haripur (11A1):** The sampler was placed at 10 No. pit office of Chora colliery, Haripur to assess the ambient air quality of industrial area in the core zone where mining activities are in progress.

ii) **GM office, Bankola area (11A2)**: The sampler was placed at GM office, Bankola. This site was selected to assess the present ambient air quality status in industrial area of core zone.

iii) **Agent office Belbaid near railway siding (11A3)**: The sampler was placed at Kali mandir of Belbaid Colony. This site was selected to assess the present ambient air quality status in Industrial area of core zone of Belbaid Incline of Kunustoria area.

iv) **Bahula Jambad pit office near railway siding (11A4)**: The sampler was placed at Bahula Jambad Pit office railway siding. This site was selected to assess the present ambient air quality status in Industrial area of core zone of Jambad OCP of Kajora area. It also has impact of coal transport.

v) **Moira Colliery Office (11A5)**: The air sampler was placed at Moira colliery office. This site was selected to assess the present ambient air quality status in Industrial area of buffer zone of Moira.

2.1 Methodology of sampling and analysis: The air quality sampling stations have been chosen keeping in view predominant wind direction and have been classified as permanent, pre monsoon (April – September) & post monsoon (October – March) air sampling stations. Particulate Matter (PM_{10}), Fine Particulate Matter ($PM_{2.5}$), Suspended Particulate Matter (SPM), Sulphur Dioxide (SO_2) and Oxides of Nitrogen (NO_x) are monitored on fortnightly basis. A few polluted sampling stations are monitored twice in a week. Heavy metals like Arsenic (As), Cadmium (Cd), Chromium (Cr), Mercury (Hg), Nickel (Ni) and Lead (Pb) are monitored half yearly.

The Respirable Suspended Particulate Matter (RSPM) Sampler & $PM_{2.5}$ Sampler machines are used for sampling of ambient air. The samples are collected and transported to Environmental Laboratory of CMPDI, RI-I, Asansol for analysis work.

2.2 Results & Interpretations: The observed value of Suspended Particulate Matter (SPM) varies from 139.4 to 391.6 µg/m^3 in industrial areas. The observed value of Particulate Matter (PM_{10}) varies from 81.4 to 294.5 µg/m^3 in industrial areas. The observed value of Fine Particulate Matter ($PM_{2.5}$) varies from 34.6 to 71.3 µm^3 in industrial areas· The observed value of Sulphur Dioxide (SO_2) has been found to be below 0.0 µg/m^3 in industrial areas· The observed value of Oxides of Nitrogen (NO_x) varies from 14.0 to 35.0 µg/m^3 in industrial areas.

AMBIENT AIR QUALITY DATA

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman, West Bengal.

First fortnight:

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results (µg/m^3)	Name of method	Detection limit (µg/m^3)
11A2	GM office, Bankola area	Industrial	06-Mar-24	SPM	339.3	IS 5182 (Part 4):1999, R: 2019	5.0
				PM_{10}	242.6	IS 5182 (Part 23): 2006, R: 2022	3.5
				$PM_{2.5}$	67.2	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2001, R: 2017	10
				NO_x	16.0	IS 5182 (Part 6): 2006, R: 2017	10
11A3	Agent office Belbaid near railway siding	Industrial	06-Mar-24	SPM	391.6	IS 5182 (Part 4):1999, R: 2019	5.0
				PM_{10}	289.3	IS 5182 (Part 23): 2006, R: 2022	3.5
				$PM_{2.5}$	71.3	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2001, R: 2017	10
				NO_x	14.0	IS 5182 (Part 6): 2006, R: 2017	10
11A4	Bahula Jambad pit office near railway siding	Industrial	06-Mar-24	SPM	298.4	IS 5182 (Part 4):1999, R: 2019	5.0
				PM_{10}	210.8	IS 5182 (Part 23): 2006, R: 2022	3.5
				$PM_{2.5}$	58.6	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2001, R: 2017	10
				NO_x	21.0	IS 5182 (Part 6): 2006, R: 2017	10
11A5	Moira Colliery Office	Industrial	12-Mar-24	SPM	274.2	IS 5182 (Part 4):1999, R: 2019	5.0
				PM_{10}	189.8	IS 5182 (Part 23): 2006, R: 2022	3.5
				$PM_{2.5}$	54.2	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2001, R: 2017	10
				NO_x	19.0	IS 5182 (Part 6): 2006, R: 2017	10

*BDL- Below Detection Limit.

Second fortnight:

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results (µg/m^3)	Name of method	Detection limit (µg/m^3)
11A2	GM office, Bankola area	Industrial	20-Mar-24	SPM	362.4	IS 5182 (Part 4):1999, R: 2019	5.0
				PM_{10}	234.5	IS 5182 (Part 23): 2006, R: 2022	3.5
				$PM_{2.5}$	52.3	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2001, R: 2017	10
				NO_x	22.0	IS 5182 (Part 6): 2006, R: 2017	10
11A3	Agent office Belbaid near railway siding	Industrial	20-Mar-24	SPM	352.7	IS 5182 (Part 4):1999, R: 2019	5.0
				PM_{10}	294.5	IS 5182 (Part 23): 2006, R: 2022	3.5
				$PM_{2.5}$	46.7	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2001, R: 2017	10
				NO_x	24.0	IS 5182 (Part 6): 2006, R: 2017	10
11A4	Bahula Jambad pit office near railway siding	Industrial	20-Mar-24	SPM	271.3	IS 5182 (Part 4):1999, R: 2019	5.0
				PM_{10}	234.8	IS 5182 (Part 23): 2006, R: 2022	3.5
				$PM_{2.5}$	47.9	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2001, R: 2017	10
				NO_x	23.0	IS 5182 (Part 6): 2006, R: 2017	10
11A5	Moira Colliery Office	Industrial	20-Mar-24	SPM	356.4	IS 5182 (Part 4):1999, R: 2019	5.0
				PM_{10}	197.6	IS 5182 (Part 23): 2006, R: 2022	3.5
				$PM_{2.5}$	38.5	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2001, R: 2017	10
				NO_x	24.0	IS 5182 (Part 6): 2006, R: 2017	10

*BDL- Below Detection Limit.

Twice in a week Monitoring

Station Code	Station Name	Category of station	Date of Sampling	Parameter	Analytical Results (µg/m³)	Name of method	Detection limit (µg/m³)
11A1	Chora pit no.10 office, Haripur	Industrial	04-Mar-24	SPM	264.2	IS 5182 (Part 4):1999, R: 2019	5.0
				PM_{10}	180.4	IS 5182 (Part 23): 2006, R: 2022	3.5
				$PM_{2.5}$	49.3	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2001, R: 2017	10
				NO_x	22.0	IS 5182 (Part 6): 2006, R: 2017	10
			05-Mar-24	SPM	284.3	IS 5182 (Part 4):1999, R: 2019	5.0
				PM_{10}	191.4	IS 5182 (Part 23): 2006, R: 2022	3.5
				$PM_{2.5}$	61.4	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2001, R: 2017	10
				NO_x	33.0	IS 5182 (Part 6): 2006, R: 2017	10
			11-Mar-24	SPM	266.7	IS 5182 (Part 4):1999, R: 2019	5.0
				PM_{10}	181.7	IS 5182 (Part 23): 2006, R: 2022	3.5
				$PM_{2.5}$	52.6	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2001, R: 2017	10
				NO_x	23.0	IS 5182 (Part 6): 2006, R: 2017	10
			12-Mar-24	SPM	261.5	IS 5182 (Part 4):1999, R: 2019	5.0
				PM_{10}	177.3	IS 5182 (Part 23): 2006, R: 2022	3.5
				$PM_{2.5}$	52.8	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2001, R: 2017	10
				NO_x	26.0	IS 5182 (Part 6): 2006, R: 2017	10
			18-Mar-24	SPM	330.2	IS 5182 (Part 4):1999, R: 2019	5.0
				PM_{10}	236.2	IS 5182 (Part 23): 2006, R: 2022	3.5
				$PM_{2.5}$	58.8	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2001, R: 2017	10
				NO_x	35.0	IS 5182 (Part 6): 2006, R: 2017	10
			19-Mar-24	SPM	146.7	IS 5182 (Part 4):1999, R: 2019	5.0
				PM_{10}	81.4	IS 5182 (Part 23): 2006, R: 2022	3.5
				$PM_{2.5}$	38.3	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2001, R: 2017	10
				NO_x	23.0	IS 5182 (Part 6): 2006, R: 2017	10
			25-Mar-24	SPM	151.6	IS 5182 (Part 4):1999, R: 2019	5.0
				PM_{10}	90.5	IS 5182 (Part 23): 2006, R: 2022	3.5
				$PM_{2.5}$	34.8	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2001, R: 2017	10
				NO_x	27.0	IS 5182 (Part 6): 2006, R: 2017	10
			26-Mar-24	SPM	139.4	IS 5182 (Part 4):1999, R: 2019	5.0
				PM_{10}	91.2	IS 5182 (Part 23): 2006, R: 2022	3.5
				$PM_{2.5}$	34.6	IS 5182 (Part 24): 2019	2.0
				SO_2	BDL	IS 5182 (Part 2): 2001, R: 2017	10
				NO_x	28.0	IS 5182 (Part 6): 2006, R: 2017	10

*BDL- Below Detection Limit.

Environmental Standards for Ambient Air Quality (AAQ):

Environmental standard for Raniganj Coalfield vide MOEF, Govt. of India, Gazette Notification No. GSR 742 (E) dated 25.09.2000 for 24 hourly samples at 500 meters from dust generating point					National Ambient Air Quality Standards (NAAQS), 2009 for industrial, residential and rural areas for 24 hours samples				
Pollutant Concentration ($\mu g/m^3$)					Pollutant Concentration ($\mu g/m^3$)				
SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_x
600.0	300.0	Not Specified	120.0	120.0	Not Specified	100.0	60.0	80.0	80.0

AMBIENT AIR HEAVY METAL ANALYSIS REPORT

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman, West Bengal.

Station No.	Station Name	Date of Sampling	Arsenic (ng/m^3)	Cadmium (µg/m^3)	Chromium (µg/m^3)	Mercury (µg/m^3)	Nickel (ng/m^3)	Lead (µg/m^3)
Method of Detection			APHA 3114B AAS VGA	APHA 3113B AAS GTA	APHA 3111B AAS Flame	APHA 3112B AAS VGA	APHA 3113 B AAS GTA	APHA 3113 B AAS GTA
Detection Limit			**1.0**	**0.001**	**0.01**	**0.001**	**0.10**	**0.005**
11A1	Chora Pit No. 10 Office, Haripur	11-Mar-24	<1.0	<0.001	<0.01	<0.001	<0.10	<0.005
11A2	GM Office of Bankola Area	6-Mar-24	<1.0	<0.001	<0.01	<0.001	<0.10	<0.005
11A3	Agent Office Belbaid near Belbaid Railway Siding	6-Mar-24	<1.0	<0.001	<0.01	<0.001	<0.10	<0.005
11A4	Bahula-Jambad Unit Pit Office near Jambad Railway Siding	6-Mar-24	<1.0	<0.001	<0.01	<0.001	<0.10	<0.005
11A5	Moira Colliery Office	12-Mar-24	<1.0	<0.001	<0.01	<0.001	<0.10	<0.005

Environmental standards: National Ambient Air Quality Standards (NAAQS) for residential, industrial and rural areas for 24 hourly/yearly samples:

Heavy Metal	Arsenic (ng/m^3)	Cadmium (µg/m^3)	Chromium (µg/m^3)	Mercury (µg/m^3)	Nickel (ng/m^3)	Lead (µg/m^3)
Concentration	6	Not specified	Not specified	Not specified	20	0.5

CHAPTER – III
WATER QUALITY MONITORING

3.1 Mine water sampling stations:

i) **New Kenda OC Patch (11MW3)**: This location has been selected to monitor the discharge quality of mine effluent to natural surface streams.

ii) **Lower Kenda (11MW4)**: This location has been selected to monitor the discharge quality of mine effluent water. The water is being supplied to colony quarters after sedimentation tank.

iii) **Chora Block Incline (11MW5)**: This location has been selected to monitor the discharge quality of mine effluent.

iv) **Chora 7, 9 & 10 Pits (11MW6)**: This location has been selected to monitor the discharge quality of mine effluent to natural surface streams.

v) **Bahula UG (11MW7)**: This location has been selected to monitor the discharge quality of mine effluent after sedimentation tank. The water is being used for sprinkling to Bahula railway siding.

vi) **C L Jambad UG (11MW8)**: This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank.

vii) **Siduli UG (11MW9)**: This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank.

viii) **Khandra UG (11MW10):** This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank.

ix) **Shankarpur UG (11MW11)**: This location has been selected to monitor the discharge quality of mine effluent to natural surface streams after sedimentation tank.

3.2 Methodology of sampling and analysis: The water samples are collected as per standard practice and transported to environment laboratory for analysis work.

The mine water samples are collected and analysed for five parameters on fortnightly basis except during the months of March and September when mine water samples are analysed for 29 parameters.

The ground water samples are collected and analysed for 26 parameters during the month of May. Water samples from filter plants are collected and analysed quarterly in the months of June, September, December and March.

3.3 Results &Interpretations: The results are given in tabular form along with the applicable standards. Results are compared with General Standards for Discharge of Effluent (Schedule VI) in case of effluent/mine water samples and compared with IS.10500: 2012 in case of drinking/ground water samples.

First fortnight:

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman, West Bengal.

Station name and Station Code: 11MW3- New Kenda OC

MINE WATER QUALITY

Sl. No.	Parameters	Analytical Results	General Standards for Discharge of Effluent (Schedule VI)	Method of Detection	Detection Limit
	Date of Sampling	13-Mar-24			
1	Colour	5	Unobjectionable	IS 3025 (Part 4): 2021	1.0
2	Odour	Un-Objectionable	Unobjectionable	IS 3025 (Part 6): 1983, R: 2018	-
3	TSS	BDL	100	IS 3025 (Part 17):1984, R: 2017	10
4	pH	7.41	5.5-9.0	IS 3025 (Part 11): 1983, R: 2017	2.0
5	Temperature (^{0}C)	25.4	Shall not exceed 5 ^{0}C above the receiving water temperature	IS 3025 (Part 9): 1984, R: 2017	5.0
6	Oil & Grease	BDL	10	IS 3025 (Part 39): 1991, R: 2019	2.0
7	Total Residual Chlorine	BDL	1.0	APHA, 4500-Cl G. DPD Colorimetric	0.02
8	Ammonical Nitrogen	0.62	50	IS 3025 (Part 34): 1988, R: 2019	0.01
9	Total Kjeldahl Nitrogen	1.93	100	APHA 4500-N_{org} B. Macro-Kjeldahl	1.0
10	Free Ammonia	BDL	5.0	IS 3025 (Part 34): 1988, R: 2019	0.02
11	BOD	BDL	30	IS 3025 (Part 44): 1993, R: 2019	2.0
12	COD	12	250	APHA 5220C Closed Reflux	4.0
13	Arsenic	BDL	0.2	APHA 3112B AAS VGA	0.002
14	Lead	BDL	0.1	APHA 3113B AAS GTA	0.005
15	Hexavalent Chromium	BDL	0.1	APHA, 3500 – Cr^{6+} B. Colorimetric	0.01
16	Total Chromium	BDL	2.0	IS 3025 (Part 52): 2003, R: 2019	0.04
17	Copper	BDL	3.0	IS 3025 (Part 42): 1992, R: 2019	0.03
18	Zinc	0.03	5.0	IS 3025 (Part 49):1994, R: 2019	0.01
19	Selenium	BDL	0.05	APHA 3111B AAS Flame	0.002
20	Nickel	BDL	3.0	IS 3025 (Part 54): 2003, R: 2019	0.01
21	Fluoride	0.35	2.0	APHA, 4500 –F D. SPADNS	0.02
22	Dissolved Phosphate	1.62	5.0	APHA, 4500-P C. Vanadomolybdophosphoric Acid Colorimetric	0.30
23	Sulphide	0.019	2.0	APHA, 4500 - S^{2-} D. Methylene Blue	0.005
24	Phenolics	BDL	1.0	APHA, 5530 C. 4-Amino-Antipyrine-Chloroform Extraction	0.001
25	Manganese	BDL	2.0	IS 3025 (Part 59): 2006, R: 2017	0.02
26	Iron	BDL	3.0	IS 3025 (Part 53): 2003, R: 2019	0.06
27	Nitrate Nitrogen	1.35	10	APHA, 4500-NO_3^- B. UV-Spectrophotometric Screening	0.5
28	Cadmium	BDL	2.0	APHA 3113B AAS GTA	0.0005
29	Total Dissolved Solids	427	Not Specified	IS 3025 (Part 16): 1984, R: 2017	25.0

* BDL- Below Detection Limit. All values are expressed in mg/L unless specified.

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman, West Bengal.

Station name and Station Code: 11MW4- Lower Kenda

MINE WATER QUALITY

Sl. No.	Parameters	Analytical Results	General Standards for Discharge of Effluent (Schedule VI)	Method of Detection	Detection Limit
	Date of Sampling	13-Mar-24			
1	Colour	5	Unobjectionable	IS 3025 (Part 4): 2021	1.0
2	Odour	Un-Objectionable	Unobjectionable	IS 3025 (Part 6): 1983, R: 2018	-
3	TSS	BDL	100	IS 3025 (Part 17):1984, R: 2017	10
4	pH	8.17	5.5-9.0	IS 3025 (Part 11): 1983, R: 2017	2.0
5	Temperature (^{0}C)	25.4	Shall not exceed 5 ^{0}C above the receiving water temperature	IS 3025 (Part 9): 1984, R: 2017	5.0
6	Oil & Grease	BDL	10	IS 3025 (Part 39): 1991, R: 2019	2.0
7	Total Residual Chlorine	BDL	1.0	APHA, 4500-Cl G. DPD Colorimetric	0.02
8	Ammonical Nitrogen	0.54	50	IS 3025 (Part 34): 1988, R: 2019	0.01
9	Total Kjeldahl Nitrogen	2.35	100	APHA 4500-N_{org} B. Macro-Kjeldahl	1.0
10	Free Ammonia	BDL	5.0	IS 3025 (Part 34): 1988, R: 2019	0.02
11	BOD	BDL	30	IS 3025 (Part 44): 1993, R: 2019	2.0
12	COD	20	250	APHA 5220C Closed Reflux	4.0
13	Arsenic	BDL	0.2	APHA 3112B AAS VGA	0.002
14	Lead	BDL	0.1	APHA 3113B AAS GTA	0.005
15	Hexavalent Chromium	BDL	0.1	APHA, 3500 – Cr^{6+} B. Colorimetric	0.01
16	Total Chromium	BDL	2.0	IS 3025 (Part 52): 2003, R: 2019	0.04
17	Copper	BDL	3.0	IS 3025 (Part 42): 1992, R: 2019	0.03
18	Zinc	0.03	5.0	IS 3025 (Part 49):1994, R: 2019	0.01
19	Selenium	BDL	0.05	APHA 3111B AAS Flame	0.002
20	Nickel	BDL	3.0	IS 3025 (Part 54): 2003, R: 2019	0.01
21	Fluoride	0.34	2.0	APHA, 4500 –F D. SPADNS	0.02
22	Dissolved Phosphate	1.45	5.0	APHA, 4500-P C. Vanadomolybdophosphoric Acid Colorimetric	0.30
23	Sulphide	0.009	2.0	APHA, 4500 - S^{2-} D. Methylene Blue	0.005
24	Phenolics	BDL	1.0	APHA, 5530 C. 4-Amino-Antipyrine-Chloroform Extraction	0.001
25	Manganese	BDL	2.0	IS 3025 (Part 59): 2006, R: 2017	0.02
26	Iron	BDL	3.0	IS 3025 (Part 53): 2003, R: 2019	0.06
27	Nitrate Nitrogen	1.24	10	APHA, 4500-NO_3^- B. UV-Spectrophotometric Screening	0.5
28	Cadmium	BDL	2.0	APHA 3113B AAS GTA	0.0005
29	Total Dissolved Solids	503	Not Specified	IS 3025 (Part 16): 1984, R: 2017	25.0

* BDL- Below Detection Limit All values are expressed in mg/L unless specified.

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman, West Bengal.

Station name and Station Code: 11MW5- Chora Block Incline

MINE WATER QUALITY

Sl. No.	Parameters	Analytical Results	General Standards for Discharge of Effluent (Schedule VI)	Method of Detection	Detection Limit
	Date of Sampling	13-Mar-24			
1	Colour	4	Unobjectionable	IS 3025 (Part 4): 2021	1.0
2	Odour	Un-Objectionable	Unobjectionable	IS 3025 (Part 6): 1983, R: 2018	-
3	TSS	BDL	100	IS 3025 (Part 17):1984, R: 2017	10
4	pH	7.99	5.5-9.0	IS 3025 (Part 11): 1983, R: 2017	2.0
5	Temperature (^{0}C)	25.4	Shall not exceed 5 ^{0}C above the receiving water temperature	IS 3025 (Part 9): 1984, R: 2017	5.0
6	Oil & Grease	BDL	10	IS 3025 (Part 39): 1991, R: 2019	2.0
7	Total Residual Chlorine	BDL	1.0	APHA, 4500-Cl G. DPD Colorimetric	0.02
8	Ammonical Nitrogen	0.56	50	IS 3025 (Part 34): 1988, R: 2019	0.01
9	Total Kjeldahl Nitrogen	2.07	100	APHA 4500-N_{org} B. Macro-Kjeldahl	1.0
10	Free Ammonia	BDL	5.0	IS 3025 (Part 34): 1988, R: 2019	0.02
11	BOD	BDL	30	IS 3025 (Part 44): 1993, R: 2019	2.0
12	COD	8	250	APHA 5220C Closed Reflux	4.0
13	Arsenic	BDL	0.2	APHA 3112B AAS VGA	0.002
14	Lead	BDL	0.1	APHA 3113B AAS GTA	0.005
15	Hexavalent Chromium	BDL	0.1	APHA, 3500 – Cr^{6+} B. Colorimetric	0.01
16	Total Chromium	BDL	2.0	IS 3025 (Part 52): 2003, R: 2019	0.04
17	Copper	BDL	3.0	IS 3025 (Part 42): 1992, R: 2019	0.03
18	Zinc	0.02	5.0	IS 3025 (Part 49):1994, R: 2019	0.01
19	Selenium	BDL	0.05	APHA 3111B AAS Flame	0.002
20	Nickel	BDL	3.0	IS 3025 (Part 54): 2003, R: 2019	0.01
21	Fluoride	0.29	2.0	APHA, 4500 –F D. SPADNS	0.02
22	Dissolved Phosphate	1.59	5.0	APHA, 4500-P C. Vanadomolybdophosphoric Acid Colorimetric	0.30
23	Sulphide	0.013	2.0	APHA, 4500 - S^{2-} D. Methylene Blue	0.005
24	Phenolics	BDL	1.0	APHA, 5530 C. 4-Amino-Antipyrine-Chloroform Extraction	0.001
25	Manganese	BDL	2.0	IS 3025 (Part 59): 2006, R: 2017	0.02
26	Iron	BDL	3.0	IS 3025 (Part 53): 2003, R: 2019	0.06
27	Nitrate Nitrogen	1.56	10	APHA, 4500-NO_3^- B. UV-Spectrophotometric Screening	0.5
28	Cadmium	BDL	2.0	APHA 3113B AAS GTA	0.0005
29	Total Dissolved Solids	521	Not Specified	IS 3025 (Part 16): 1984, R: 2017	25.0

* BDL- Below Detection Limit All values are expressed in mg/L unless specified.

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman, West Bengal.

Station name and Station Code: 11MW6- Chora 7, 9 & 10 Pits

MINE WATER QUALITY

Sl. No.	Parameters	Analytical Results	General Standards for Discharge of Effluent (Schedule VI)	Method of Detection	Detection Limit
	Date of Sampling	13-Mar-24			
1	Colour	4	Unobjectionable	IS 3025 (Part 4): 2021	1.0
2	Odour	Un-Objectionable	Unobjectionable	IS 3025 (Part 6): 1983, R: 2018	-
3	TSS	BDL	100	IS 3025 (Part 17):1984, R: 2017	10
4	pH	7.83	5.5-9.0	IS 3025 (Part 11): 1983, R: 2017	2.0
5	Temperature (^{0}C)	25.4	Shall not exceed 5 ^{0}C above the receiving water temperature	IS 3025 (Part 9): 1984, R: 2017	5.0
6	Oil & Grease	BDL	10	IS 3025 (Part 39): 1991, R: 2019	2.0
7	Total Residual Chlorine	BDL	1.0	APHA, 4500-Cl G. DPD Colorimetric	0.02
8	Ammonical Nitrogen	0.67	50	IS 3025 (Part 34): 1988, R: 2019	0.01
9	Total Kjeldahl Nitrogen	1.68	100	APHA 4500-N_{org} B. Macro-Kjeldahl	1.0
10	Free Ammonia	BDL	5.0	IS 3025 (Part 34): 1988, R: 2019	0.02
11	BOD	14.20	30	IS 3025 (Part 44): 1993, R: 2019	2.0
12	COD	16	250	APHA 5220C Closed Reflux	4.0
13	Arsenic	BDL	0.2	APHA 3112B AAS VGA	0.002
14	Lead	BDL	0.1	APHA 3113B AAS GTA	0.005
15	Hexavalent Chromium	BDL	0.1	APHA, 3500 – Cr^{6+} B. Colorimetric	0.01
16	Total Chromium	BDL	2.0	IS 3025 (Part 52): 2003, R: 2019	0.04
17	Copper	BDL	3.0	IS 3025 (Part 42): 1992, R: 2019	0.03
18	Zinc	0.02	5.0	IS 3025 (Part 49):1994, R: 2019	0.01
19	Selenium	BDL	0.05	APHA 3111B AAS Flame	0.002
20	Nickel	BDL	3.0	IS 3025 (Part 54): 2003, R: 2019	0.01
21	Fluoride	0.35	2.0	APHA, 4500 –F D. SPADNS	0.02
22	Dissolved Phosphate	1.86	5.0	APHA, 4500-P C. Vanadomolybdophosphoric Acid Colorimetric	0.30
23	Sulphide	0.016	2.0	APHA, 4500 - S^{2-} D. Methylene Blue	0.005
24	Phenolics	BDL	1.0	APHA, 5530 C. 4-Amino-Antipyrine-Chloroform Extraction	0.001
25	Manganese	BDL	2.0	IS 3025 (Part 59): 2006, R: 2017	0.02
26	Iron	BDL	3.0	IS 3025 (Part 53): 2003, R: 2019	0.06
27	Nitrate Nitrogen	1.28	10	APHA, 4500-NO_3^- B. UV-Spectrophotometric Screening	0.5
28	Cadmium	BDL	2.0	APHA 3113B AAS GTA	0.0005
29	Total Dissolved Solids	532	Not Specified	IS 3025 (Part 16): 1984, R: 2017	25.0

* BDL- Below Detection Limit All values are expressed in mg/L unless specified.

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman, West Bengal.

Station name and Station Code: 11MW7- Bahula UG

MINE WATER QUALITY

Sl. No.	Parameters	Analytical Results	General Standards for Discharge of Effluent (Schedule VI)	Method of Detection	Detection Limit
	Date of Sampling	13-Mar-24			
1	Colour	4	Unobjectionable	IS 3025 (Part 4): 2021	1.0
2	Odour	Un-Objectionable	Unobjectionable	IS 3025 (Part 6): 1983, R: 2018	-
3	TSS	BDL	100	IS 3025 (Part 17):1984, R: 2017	10
4	pH	7.64	5.5-9.0	IS 3025 (Part 11): 1983, R: 2017	2.0
5	Temperature (^{0}C)	25.4	Shall not exceed 5 ^{0}C above the receiving water temperature	IS 3025 (Part 9): 1984, R: 2017	5.0
6	Oil & Grease	BDL	10	IS 3025 (Part 39): 1991, R: 2019	2.0
7	Total Residual Chlorine	BDL	1.0	APHA, 4500-Cl G. DPD Colorimetric	0.02
8	Ammonical Nitrogen	0.78	50	IS 3025 (Part 34): 1988, R: 2019	0.01
9	Total Kjeldahl Nitrogen	1.79	100	APHA 4500-N_{org} B. Macro-Kjeldahl	1.0
10	Free Ammonia	BDL	5.0	IS 3025 (Part 34): 1988, R: 2019	0.02
11	BOD	BDL	30	IS 3025 (Part 44): 1993, R: 2019	2.0
12	COD	12	250	APHA 5220C Closed Reflux	4.0
13	Arsenic	BDL	0.2	APHA 3112B AAS VGA	0.002
14	Lead	BDL	0.1	APHA 3113B AAS GTA	0.005
15	Hexavalent Chromium	BDL	0.1	APHA, 3500 – Cr^{6+} B. Colorimetric	0.01
16	Total Chromium	BDL	2.0	IS 3025 (Part 52): 2003, R: 2019	0.04
17	Copper	BDL	3.0	IS 3025 (Part 42): 1992, R: 2019	0.03
18	Zinc	0.03	5.0	IS 3025 (Part 49):1994, R: 2019	0.01
19	Selenium	BDL	0.05	APHA 3111B AAS Flame	0.002
20	Nickel	BDL	3.0	IS 3025 (Part 54): 2003, R: 2019	0.01
21	Fluoride	0.33	2.0	APHA, 4500 –F D. SPADNS	0.02
22	Dissolved Phosphate	1.87	5.0	APHA, 4500-P C. Vanadomolybdophosphoric Acid Colorimetric	0.30
23	Sulphide	0.016	2.0	APHA, 4500 - S^{2-} D. Methylene Blue	0.005
24	Phenolics	BDL	1.0	APHA, 5530 C. 4-Amino-Antipyrine-Chloroform Extraction	0.001
25	Manganese	0.02	2.0	IS 3025 (Part 59): 2006, R: 2017	0.02
26	Iron	BDL	3.0	IS 3025 (Part 53): 2003, R: 2019	0.06
27	Nitrate Nitrogen	1.36	10	APHA, 4500-NO_3^- B. UV-Spectrophotometric Screening	0.5
28	Cadmium	BDL	2.0	APHA 3113B AAS GTA	0.0005
29	Total Dissolved Solids	517	Not Specified	IS 3025 (Part 16): 1984, R: 2017	25.0

* BDL- Below Detection Limit

All values are expressed in mg/L unless specified.

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman, West Bengal.

Station name and Station Code: 11MW8- C L Jambad UG

MINE WATER QUALITY

Sl. No.	Parameters	Analytical Results	General Standards for Discharge of Effluent (Schedule VI)	Method of Detection	Detection Limit
	Date of Sampling	13-Mar-24			
1	Colour	3	Unobjectionable	IS 3025 (Part 4): 2021	1.0
2	Odour	Un-Objectionable	Unobjectionable	IS 3025 (Part 6): 1983, R: 2018	-
3	TSS	BDL	100	IS 3025 (Part 17):1984, R: 2017	10
4	pH	7.90	5.5-9.0	IS 3025 (Part 11): 1983, R: 2017	2.0
5	Temperature (^{0}C)	25.4	Shall not exceed 5 ^{0}C above the receiving water temperature	IS 3025 (Part 9): 1984, R: 2017	5.0
6	Oil & Grease	BDL	10	IS 3025 (Part 39): 1991, R: 2019	2.0
7	Total Residual Chlorine	BDL	1.0	APHA, 4500-Cl G. DPD Colorimetric	0.02
8	Ammonical Nitrogen	0.84	50	IS 3025 (Part 34): 1988, R: 2019	0.01
9	Total Kjeldahl Nitrogen	2.24	100	APHA 4500-N_{org} B. Macro-Kjeldahl	1.0
10	Free Ammonia	BDL	5.0	IS 3025 (Part 34): 1988, R: 2019	0.02
11	BOD	BDL	30	IS 3025 (Part 44): 1993, R: 2019	2.0
12	COD	20	250	APHA 5220C Closed Reflux	4.0
13	Arsenic	BDL	0.2	APHA 3112B AAS VGA	0.002
14	Lead	BDL	0.1	APHA 3113B AAS GTA	0.005
15	Hexavalent Chromium	BDL	0.1	APHA, 3500 – Cr^{6+} B. Colorimetric	0.01
16	Total Chromium	BDL	2.0	IS 3025 (Part 52): 2003, R: 2019	0.04
17	Copper	BDL	3.0	IS 3025 (Part 42): 1992, R: 2019	0.03
18	Zinc	0.02	5.0	IS 3025 (Part 49):1994, R: 2019	0.01
19	Selenium	BDL	0.05	APHA 3111B AAS Flame	0.002
20	Nickel	BDL	3.0	IS 3025 (Part 54): 2003, R: 2019	0.01
21	Fluoride	0.38	2.0	APHA, 4500 –F D. SPADNS	0.02
22	Dissolved Phosphate	1.79	5.0	APHA, 4500-P C. Vanadomolybdophosphoric Acid Colorimetric	0.30
23	Sulphide	0.010	2.0	APHA, 4500 - S^{2-} D. Methylene Blue	0.005
24	Phenolics	BDL	1.0	APHA, 5530 C. 4-Amino-Antipyrine-Chloroform Extraction	0.001
25	Manganese	BDL	2.0	IS 3025 (Part 59): 2006, R: 2017	0.02
26	Iron	BDL	3.0	IS 3025 (Part 53): 2003, R: 2019	0.06
27	Nitrate Nitrogen	1.48	10	APHA, 4500-NO_3^- B. UV-Spectrophotometric Screening	0.5
28	Cadmium	BDL	2.0	APHA 3113B AAS GTA	0.0005
29	Total Dissolved Solids	620	Not Specified	IS 3025 (Part 16): 1984, R: 2017	25.0

* BDL- Below Detection Limit All values are expressed in mg/L unless specified.

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman, West Bengal.

Station name and Station Code: 11MW9- Siduli UG

MINE WATER QUALITY

Sl. No.	Parameters	Analytical Results	General Standards for Discharge of Effluent (Schedule VI)	Method of Detection	Detection Limit
	Date of Sampling	13-Mar-24			
1	Colour	5	Unobjectionable	IS 3025 (Part 4): 2021	1.0
2	Odour	Un-Objectionable	Unobjectionable	IS 3025 (Part 6): 1983, R: 2018	-
3	TSS	BDL	100	IS 3025 (Part 17):1984, R: 2017	10
4	pH	8.02	5.5-9.0	IS 3025 (Part 11): 1983, R: 2017	2.0
5	Temperature (^{0}C)	25.4	Shall not exceed 5 ^{0}C above the receiving water temperature	IS 3025 (Part 9): 1984, R: 2017	5.0
6	Oil & Grease	BDL	10	IS 3025 (Part 39): 1991, R: 2019	2.0
7	Total Residual Chlorine	BDL	1.0	APHA, 4500-Cl G. DPD Colorimetric	0.02
8	Ammonical Nitrogen	0.96	50	IS 3025 (Part 34): 1988, R: 2019	0.01
9	Total Kjeldahl Nitrogen	1.62	100	APHA 4500-N_{org} B. Macro-Kjeldahl	1.0
10	Free Ammonia	BDL	5.0	IS 3025 (Part 34): 1988, R: 2019	0.02
11	BOD	BDL	30	IS 3025 (Part 44): 1993, R: 2019	2.0
12	COD	12	250	APHA 5220C Closed Reflux	4.0
13	Arsenic	BDL	0.2	APHA 3112B AAS VGA	0.002
14	Lead	BDL	0.1	APHA 3113B AAS GTA	0.005
15	Hexavalent Chromium	BDL	0.1	APHA, 3500 – Cr^{6+} B. Colorimetric	0.01
16	Total Chromium	BDL	2.0	IS 3025 (Part 52): 2003, R: 2019	0.04
17	Copper	BDL	3.0	IS 3025 (Part 42): 1992, R: 2019	0.03
18	Zinc	0.03	5.0	IS 3025 (Part 49):1994, R: 2019	0.01
19	Selenium	BDL	0.05	APHA 3111B AAS Flame	0.002
20	Nickel	BDL	3.0	IS 3025 (Part 54): 2003, R: 2019	0.01
21	Fluoride	0.36	2.0	APHA, 4500 –F D. SPADNS	0.02
22	Dissolved Phosphate	1.82	5.0	APHA, 4500-P C. Vanadomolybdophosphoric Acid Colorimetric	0.30
23	Sulphide	0.022	2.0	APHA, 4500 - S^{2-} D. Methylene Blue	0.005
24	Phenolics	BDL	1.0	APHA, 5530 C. 4-Amino-Antipyrine-Chloroform Extraction	0.001
25	Manganese	BDL	2.0	IS 3025 (Part 59): 2006, R: 2017	0.02
26	Iron	BDL	3.0	IS 3025 (Part 53): 2003, R: 2019	0.06
27	Nitrate Nitrogen	1.42	10	APHA, 4500-NO_3^- B. UV-Spectrophotometric Screening	0.5
28	Cadmium	BDL	2.0	APHA 3113B AAS GTA	0.0005
29	Total Dissolved Solids	520	Not Specified	IS 3025 (Part 16): 1984, R: 2017	25.0

* BDL- Below Detection Limit. All values are expressed in mg/L unless specified.

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman, West Bengal.

Station name and Station Code: 11MW10- Khandra UG

MINE WATER QUALITY

Sl. No.	Parameters	Analytical Results	General Standards for Discharge of Effluent (Schedule VI)	Method of Detection	Detection Limit
	Date of Sampling	13-Mar-24			
1	Colour	4	Unobjectionable	IS 3025 (Part 4): 2021	1.0
2	Odour	Un-Objectionable	Unobjectionable	IS 3025 (Part 6): 1983, R: 2018	-
3	TSS	BDL	100	IS 3025 (Part 17):1984, R: 2017	10
4	pH	8.07	5.5-9.0	IS 3025 (Part 11): 1983, R: 2017	2.0
5	Temperature (^{0}C)	25.4	Shall not exceed 5 ^{0}C above the receiving water temperature	IS 3025 (Part 9): 1984, R: 2017	5.0
6	Oil & Grease	BDL	10	IS 3025 (Part 39): 1991, R: 2019	2.0
7	Total Residual Chlorine	BDL	1.0	APHA, 4500-Cl G. DPD Colorimetric	0.02
8	Ammonical Nitrogen	0.48	50	IS 3025 (Part 34): 1988, R: 2019	0.01
9	Total Kjeldahl Nitrogen	1.84	100	APHA 4500-N_{org} B. Macro-Kjeldahl	1.0
10	Free Ammonia	BDL	5.0	IS 3025 (Part 34): 1988, R: 2019	0.02
11	BOD	BDL	30	IS 3025 (Part 44): 1993, R: 2019	2.0
12	COD	16	250	APHA 5220C Closed Reflux	4.0
13	Arsenic	BDL	0.2	APHA 3112B AAS VGA	0.002
14	Lead	BDL	0.1	APHA 3113B AAS GTA	0.005
15	Hexavalent Chromium	BDL	0.1	APHA, 3500 – Cr^{6+} B. Colorimetric	0.01
16	Total Chromium	BDL	2.0	IS 3025 (Part 52): 2003, R: 2019	0.04
17	Copper	BDL	3.0	IS 3025 (Part 42): 1992, R: 2019	0.03
18	Zinc	0.02	5.0	IS 3025 (Part 49):1994, R: 2019	0.01
19	Selenium	BDL	0.05	APHA 3111B AAS Flame	0.002
20	Nickel	BDL	3.0	IS 3025 (Part 54): 2003, R: 2019	0.01
21	Fluoride	0.38	2.0	APHA, 4500 –F D. SPADNS	0.02
22	Dissolved Phosphate	1.70	5.0	APHA, 4500-P C. Vanadomolybdophosphoric Acid Colorimetric	0.30
23	Sulphide	0.010	2.0	APHA, 4500 - S^{2-} D. Methylene Blue	0.005
24	Phenolics	BDL	1.0	APHA, 5530 C. 4-Amino-Antipyrine-Chloroform Extraction	0.001
25	Manganese	BDL	2.0	IS 3025 (Part 59): 2006, R: 2017	0.02
26	Iron	BDL	3.0	IS 3025 (Part 53): 2003, R: 2019	0.06
27	Nitrate Nitrogen	1.40	10	APHA, 4500-NO_3^- B. UV-Spectrophotometric Screening	0.5
28	Cadmium	BDL	2.0	APHA 3113B AAS GTA	0.0005
29	Total Dissolved Solids	605	Not Specified	IS 3025 (Part 16): 1984, R: 2017	25.0

* BDL- Below Detection Limit. All values are expressed in mg/L unless specified.

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman, West Bengal.

Station name and Station Code: 11MW11- Shankarpur UG

MINE WATER QUALITY

Sl. No.	Parameters	Analytical Results	General Standards for Discharge of Effluent (Schedule VI)	Method of Detection	Detection Limit
	Date of Sampling	13-Mar-24			
1	Colour	4	Unobjectionable	IS 3025 (Part 4): 2021	1.0
2	Odour	Un-Objectionable	Unobjectionable	IS 3025 (Part 6): 1983, R: 2018	-
3	TSS	BDL	100	IS 3025 (Part 17):1984, R: 2017	10
4	pH	7.90	5.5-9.0	IS 3025 (Part 11): 1983, R: 2017	2.0
5	Temperature (^{0}C)	25.4	Shall not exceed 5 ^{0}C above the receiving water temperature	IS 3025 (Part 9): 1984, R: 2017	5.0
6	Oil & Grease	BDL	10	IS 3025 (Part 39): 1991, R: 2019	2.0
7	Total Residual Chlorine	BDL	1.0	APHA, 4500-Cl G. DPD Colorimetric	0.02
8	Ammonical Nitrogen	0.58	50	IS 3025 (Part 34): 1988, R: 2019	0.01
9	Total Kjeldahl Nitrogen	1.69	100	APHA 4500-N_{org} B. Macro-Kjeldahl	1.0
10	Free Ammonia	BDL	5.0	IS 3025 (Part 34): 1988, R: 2019	0.02
11	BOD	BDL	30	IS 3025 (Part 44): 1993, R: 2019	2.0
12	COD	8	250	APHA 5220C Closed Reflux	4.0
13	Arsenic	BDL	0.2	APHA 3112B AAS VGA	0.002
14	Lead	BDL	0.1	APHA 3113B AAS GTA	0.005
15	Hexavalent Chromium	BDL	0.1	APHA, 3500 – Cr^{6+} B. Colorimetric	0.01
16	Total Chromium	BDL	2.0	IS 3025 (Part 52): 2003, R: 2019	0.04
17	Copper	BDL	3.0	IS 3025 (Part 42): 1992, R: 2019	0.03
18	Zinc	0.03	5.0	IS 3025 (Part 49):1994, R: 2019	0.01
19	Selenium	BDL	0.05	APHA 3111B AAS Flame	0.002
20	Nickel	BDL	3.0	IS 3025 (Part 54): 2003, R: 2019	0.01
21	Fluoride	0.35	2.0	APHA, 4500 –F D. SPADNS	0.02
22	Dissolved Phosphate	1.58	5.0	APHA, 4500-P C. Vanadomolybdophosphoric Acid Colorimetric	0.30
23	Sulphide	0.009	2.0	APHA, 4500 - S^{2-} D. Methylene Blue	0.005
24	Phenolics	BDL	1.0	APHA, 5530 C. 4-Amino-Antipyrine-Chloroform Extraction	0.001
25	Manganese	BDL	2.0	IS 3025 (Part 59): 2006, R: 2017	0.02
26	Iron	BDL	3.0	IS 3025 (Part 53): 2003, R: 2019	0.06
27	Nitrate Nitrogen	1.55	10	APHA, 4500-NO_3^- B. UV-Spectrophotometric Screening	0.5
28	Cadmium	BDL	2.0	APHA 3113B AAS GTA	0.0005
29	Total Dissolved Solids	478	Not Specified	IS 3025 (Part 16): 1984, R: 2017	25.0

* BDL- Below Detection Limit. All values are expressed in mg/L unless specified.

Second fortnight:

Sl. No.	Parameters	Analytical results (mg/l)				General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit (mg/l)
	Station Code	11MW3	11MW4	11MW5	11MW6			
	Date of sampling	28-Mar-24	28-Mar-24	28-Mar-24	28-Mar-24			
1	pH value	7.52	8.09	8.11	7.90	5.5 - 9.0	IS 3025 (Part 11) : 1983, R: 2017	2.0
2	TSS	BDL	BDL	BDL	BDL	100	IS 3025 (Part - 17): 1984, R: 2017	10.0
3	TDS	455	468	524	607	Not specified	IS 3025 (Part - 16): 1984, R: 2017	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39) : 1991, R: 2019	2.0
5	COD	16	24	12	8	250	APHA 5220C Closed Reflux	4.0

Sl. No.	Parameters	Analytical results (mg/l)					General Standards for Discharge of Effluent (Schedule VI)	Name of Method	Detection Limit (mg/l)
	Station Code	11MW7	11MW8	11MW9	11MW10	11MW11			
	Date of sampling	28-Mar-24	28-Mar-24	28-Mar-24	28-Mar-24	28-Mar-24			
1	pH value	7.71	8.14	7.99	8.13	8.22	5.5 - 9.0	IS 3025 (Part 11) : 1983, R: 2017	2.0
2	TSS	BDL	BDL	BDL	BDL	BDL	100	IS 3025 (Part -17): 1984, R: 2017	10.0
3	TDS	517	508	550	647	608	Not specified	IS 3025 (Part -16): 1984, R: 2017	25.0
4	Oil & Grease	BDL	BDL	BDL	BDL	BDL	10	IS 3025 (Part 39) : 1991, R: 2019	2.0
5	COD	20	16	24	8	20	250	APHA 5220C Closed Reflux	4.0

*BDL-Below Detection Limit

All values are expressed in mg/l except pH.

DRINKING WATER QUALITY

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman

Name of station & code: **11DW1- Pressure filter at Chora 7&9 Pit**

11DW2- Pressure filter at Bahula

Sl. No.	Parameters / Sample code / Sampling Date	Analytical Results 11DW1	Analytical Results 11DW2	Indian Standard Drinking Water (IS-10500 :2012) Acceptable Limit	Indian Standard Drinking Water (IS-10500 :2012) Permissible Limit	Method of detection	Detection Limit
	Sampling Date	13-Mar-24	29-Mar-24				
1	Colour, Hazen	4	2	5.0	15.0	IS 3025 (Part 4): 2021	1.0
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable		IS 3025 (Part 6): 1983, R: 2018	-
3	Taste	Agreeable	Agreeable	Agreeable		IS 3025 (Part 7): 1984	-
4	Turbidity, NTU	BDL	BDL	1	5	IS 3025 (Part 10): 1984; R: 2017	1.0 NTU
5	pH	7.98	7.38	6.5-8.5	No relaxation	IS 3025 (Part 11): 1983, R: 2017	2.0
6	Total Hardness	321.36	276.04	300	600	IS 3025 Part 21: 2009, R: 2019	4.0
7	Iron	BDL	BDL	0.3	No relaxation	IS 3025 (Part 53): 2003, R: 2019	0.06
8	Chlorides	44.70	42.11	250	1000	IS 3025 Part 32-1988, R: 2019	2.0
9	Residual Free Chlorine	0.03	0.03	0.2	1	APHA, 4500-Cl G. DPD Colorimetric	0.02
10	Dissolved Solids	575	437	500	2000	IS 3025 (Part 16): 1984, R: 2017	25.0
11	Calcium	49.53	39.62	75	200	IS 3025 Part 40 : 1991, R: 2019	1.60
12	Copper	BDL	BDL	0.05	1.5	APHA 3111B AAS Flame	0.03
13	Manganese	BDL	BDL	0.1	0.3	APHA 3111B AAS Flame	0.02
14	Sulphate	196.26	83.73	200	400	APHA, 4500-SO_4^{2-} E. Turbidimetric	2.0
15	Nitrate	6.67	4.29	45	No relaxation	APHA, 4500-NO_3^- B. UV-Spectrophotometric Screening	0.5
16	Fluoride	0.40	0.60	1	1.5	APHA, 4500 –F D. SPADNS	0.02
17	Selenium	BDL	BDL	0.01	No relaxation	APHA 3111B AAS Flame	0.002
18	Arsenic	BDL	BDL	0.01	0.05	APHA 3112B AAS VGA	0.002
19	Lead	BDL	BDL	0.01	No relaxation	APHA 3113B AAS GTA	0.005
20	Zinc	0.04	0.03	5	15	APHA 3111B AAS Flame	0.01
21	Hexavalent Chromium	BDL	BDL	0.05	0.05	APHA 3500B Colorimetric	0.01
22	Boron	BDL	BDL	0.5	1	APHA, 4500 B Curcumine	0.20
23	Coliforms (MPN)	Nil	Nil	Not Specified		APHA, 9221 B. Standard Total Coliform Fermentation	1.0
24	Phenolics	BDL	BDL	0.001	0.002	IS 3025 (Part 43): 2022	0.001
25	Alkalinity	240.40	240.30	200	600	IS 3025 Part 23: 1986, R: 2019	4.0
26	Cadmium	BDL	BDL	0.003	No relaxation	APHA 3113B AAS GTA	0.0005

* BDL- Below Detection Limit. *All values are expressed in mg/l unless specified.*

DRINKING WATER QUALITY

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman.

Name of station & code: **11DW3- Pressure filter at Lower Kenda**

11DW4- Pressure filter at Kenda area complex

Sl. No.	Parameters / Sample code / Sampling Date	Analytical Results 11DW3	Analytical Results 11DW4	Indian Standard Drinking Water (IS-10500 :2012) Acceptable Limit	Indian Standard Drinking Water (IS-10500 :2012) Permissible Limit	Method of detection	Detection Limit
	Sampling Date	20-Mar-24	18-Mar-24				
1	Colour, Hazen	3	4	5.0	15.0	IS 3025 (Part 4): 2021	1.0
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable		IS 3025 (Part 6): 1983, R: 2018	-
3	Taste	Agreeable	Agreeable	Agreeable		IS 3025 (Part 7): 1984	-
4	Turbidity, NTU	BDL	BDL	1	5	IS 3025 (Part 10): 1984; R: 2017	1.0 NTU
5	pH	8.12	7.67	6.5-8.5	No relaxation	IS 3025 (Part 11): 1983, R: 2017	2.0
6	Total Hardness	247.20	288.40	300	600	IS 3025 Part 21: 2009, R: 2019	4.0
7	Iron	BDL	BDL	0.3	No relaxation	IS 3025 (Part 53): 2003, R: 2019	0.06
8	Chlorides	45.94	30.63	250	1000	IS 3025 Part 32-1988, R: 2019	2.0
9	Residual Free Chlorine	0.02	0.03	0.2	1	APHA, 4500-Cl G. DPD Colorimetric	0.02
10	Dissolved Solids	383	770	500	2000	IS 3025 (Part 16): 1984, R: 2017	25.0
11	Calcium	33.02	56.13	75	200	IS 3025 Part 40 : 1991, R: 2019	1.60
12	Copper	BDL	BDL	0.05	1.5	APHA 3111B AAS Flame	0.03
13	Manganese	BDL	BDL	0.1	0.3	APHA 3111B AAS Flame	0.02
14	Sulphate	90.32	79.84	200	400	APHA, 4500-SO_4^{2-} E. Turbidimetric	2.0
15	Nitrate	4.38	0.89	45	No relaxation	APHA, 4500-NO_3^- B. UV-Spectrophotometric Screening	0.5
16	Fluoride	0.65	0.42	1	1.5	APHA, 4500 –F D. SPADNS	0.02
17	Selenium	BDL	BDL	0.01	No relaxation	APHA 3111B AAS Flame	0.002
18	Arsenic	BDL	BDL	0.01	0.05	APHA 3112B AAS VGA	0.002
19	Lead	BDL	BDL	0.01	No relaxation	APHA 3113B AAS GTA	0.005
20	Zinc	0.06	0.04	5	15	APHA 3111B AAS Flame	0.01
21	Hexavalent Chromium	BDL	BDL	0.05	0.05	APHA 3500B Colorimetric	0.01
22	Boron	BDL	BDL	0.5	1	APHA, 4500 B Curcumine	0.20
23	Coliforms (MPN)	Nil	Nil	Not Specified		APHA, 9221 B. Standard Total Coliform Fermentation	1.0
24	Phenolics	BDL	BDL	0.001	0.002	IS 3025 (Part 43): 2022	0.001
25	Alkalinity	213.60	261.66	200	600	IS 3025 Part 23: 1986, R: 2019	4.0
26	Cadmium	BDL	BDL	0.003	No relaxation	APHA 3113B AAS GTA	0.0005

*BDL- Below Detection Limit. *All values are expressed in mg/l unless specified.*

DRINKING WATER QUALITY

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman.

Name of station & code: **11DW5- Pressure filter at Siduli**

11DW6- Pressure filter at C. L. Jambad

Sl. No.	Parameters / Sample code / Sampling Date	Analytical Results 11DW5	11DW6	Indian Standard Drinking Water (IS-10500 :2012) Acceptable Limit	Permissible Limit	Method of detection	Detection Limit
	Sampling Date	18-Mar-24	18-Mar-24				
1	Colour, Hazen	3	3	5.0	15.0	IS 3025 (Part 4): 2021	1.0
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable		IS 3025 (Part 6): 1983, R: 2018	-
3	Taste	Agreeable	Agreeable	Agreeable		IS 3025 (Part 7): 1984	-
4	Turbidity, NTU	BDL	BDL	1	5	IS 3025 (Part 10): 1984; R: 2017	1.0 NTU
5	pH	7.86	7.89	6.5-8.5	No relaxation	IS 3025 (Part 11): 1983, R: 2017	2.0
6	Total Hardness	247.20	321.36	300	600	IS 3025 Part 21: 2009, R: 2019	4.0
7	Iron	BDL	BDL	0.3	No relaxation	IS 3025 (Part 53): 2003, R: 2019	0.06
8	Chlorides	26.80	45.50	250	1000	IS 3025 Part 32-1988, R: 2019	2.0
9	Residual Free Chlorine	0.02	0.02	0.2	1	APHA, 4500-Cl G. DPD Colorimetric	0.02
10	Dissolved Solids	495	513	500	2000	IS 3025 (Part 16): 1984, R: 2017	25.0
11	Calcium	39.62	56.13	75	200	IS 3025 Part 40 : 1991, R: 2019	1.60
12	Copper	BDL	BDL	0.05	1.5	APHA 3111B AAS Flame	0.03
13	Manganese	BDL	BDL	0.1	0.3	APHA 3111B AAS Flame	0.02
14	Sulphate	74.34	244.16	200	400	APHA, 4500-SO_4^{2-} E. Turbidimetric	2.0
15	Nitrate	6.58	1.77	45	No relaxation	APHA, 4500-NO_3^- B. UV-Spectrophotometric Screening	0.5
16	Fluoride	0.50	0.40	1	1.5	APHA, 4500 –F D. SPADNS	0.02
17	Selenium	BDL	BDL	0.01	No relaxation	APHA 3111B AAS Flame	0.002
18	Arsenic	BDL	BDL	0.01	0.05	APHA 3112B AAS VGA	0.002
19	Lead	BDL	BDL	0.01	No relaxation	APHA 3113B AAS GTA	0.005
20	Zinc	0.03	0.03	5	15	APHA 3111B AAS Flame	0.01
21	Hexavalent Chromium	BDL	BDL	0.05	0.05	APHA 3500B Colorimetric	0.01
22	Boron	BDL	BDL	0.5	1	APHA, 4500 B Curcumine	0.20
23	Coliforms (MPN)	Nil	Nil	Not Specified		APHA, 9221 B. Standard Total Coliform Fermentation	1.0
24	Phenolics	BDL	BDL	0.001	0.002	IS 3025 (Part 43): 2022	0.001
25	Alkalinity	186.90	167.19	200	600	IS 3025 Part 23: 1986, R: 2019	4.0
26	Cadmium	BDL	BDL	0.003	No relaxation	APHA 3113B AAS GTA	0.0005

*BDL- Below Detection Limit. *All values are expressed in mg/l unless specified.*

DRINKING WATER QUALITY

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman.

Name of station & code: **11DW7- R O filter plant at Kenda area complex**
11DW8- Pressure filter at New Kenda

Sl. No.	Parameters / Sample code	Analytical Results 11DW7	Analytical Results 11DW8	Indian Standard Drinking Water (IS-10500 :2012) Acceptable Limit	Indian Standard Drinking Water (IS-10500 :2012) Permissible Limit	Method of detection	Detection Limit
	Sampling Date	18-Mar-24	21-Mar-24				
1	Colour, Hazen	4	2	5.0	15.0	IS 3025 (Part 4): 2021	1.0
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable		IS 3025 (Part 6): 1983, R: 2018	-
3	Taste	Agreeable	Agreeable	Agreeable		IS 3025 (Part 7): 1984	-
4	Turbidity, NTU	BDL	BDL	1	5	IS 3025 (Part 10): 1984; R: 2017	1.0 NTU
5	pH	7.98	7.80	6.5-8.5	No relaxation	IS 3025 (Part 11): 1983, R: 2017	2.0
6	Total Hardness	197.76	148.32	300	600	IS 3025 Part 21: 2009, R: 2019	4.0
7	Iron	BDL	BDL	0.3	No relaxation	IS 3025 (Part 53): 2003, R: 2019	0.06
8	Chlorides	21.06	49.77	250	1000	IS 3025 Part 32-1988, R: 2019	2.0
9	Residual Free Chlorine	0.03	0.03	0.2	1	APHA, 4500-Cl G. DPD Colorimetric	0.02
10	Dissolved Solids	312	372	500	2000	IS 3025 (Part 16): 1984, R: 2017	25.0
11	Calcium	33.02	24.76	75	200	IS 3025 Part 40 : 1991, R: 2019	1.60
12	Copper	BDL	BDL	0.05	1.5	APHA 3111B AAS Flame	0.03
13	Manganese	BDL	BDL	0.1	0.3	APHA 3111B AAS Flame	0.02
14	Sulphate	62.20	61.82	200	400	APHA, 4500-SO_4^{2-} E. Turbidimetric	2.0
15	Nitrate	0.98	6.47	45	No relaxation	APHA, 4500-NO_3^- B. UV-Spectrophotometric Screening	0.5
16	Fluoride	0.44	0.46	1	1.5	APHA, 4500 –F D. SPADNS	0.02
17	Selenium	BDL	BDL	0.01	No relaxation	APHA 3111B AAS Flame	0.002
18	Arsenic	BDL	BDL	0.01	0.05	APHA 3112B AAS VGA	0.002
19	Lead	BDL	BDL	0.01	No relaxation	APHA 3113B AAS GTA	0.005
20	Zinc	0.04	0.03	5	15	APHA 3111B AAS Flame	0.01
21	Hexavalent Chromium	BDL	BDL	0.05	0.05	APHA 3500B Colorimetric	0.01
22	Boron	BDL	BDL	0.5	1	APHA, 4500 B Curcumine	0.20
23	Coliforms (MPN)	Nil	Nil	Not Specified		APHA, 9221 B. Standard Total Coliform Fermentation	1.0
24	Phenolics	BDL	BDL	0.001	0.002	IS 3025 (Part 43): 2022	0.001
25	Alkalinity	170.88	138.84	200	600	IS 3025 Part 23: 1986, R: 2019	4.0
26	Cadmium	BDL	BDL	0.003	No relaxation	APHA 3113B AAS GTA	0.0005

*BDL- Below Detection Limit. *All values are expressed in mg/l unless specified.*

DRINKING WATER QUALITY

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman.

Name of station & code: **11DW9- Filter plant at V. N. colony executive hostel**
11DW10- Filter plant at R. N. colony hostel

Sl. No.	Parameters / Sample code / Sampling Date	Analytical Results 11DW9	Analytical Results 11DW10	Indian Standard Drinking Water (IS-10500 :2012) Acceptable Limit	Indian Standard Drinking Water (IS-10500 :2012) Permissible Limit	Method of detection	Detection Limit
	Sampling Date	21-Mar-24	18-Mar-24				
1	Colour, Hazen	2	2	5.0	15.0	IS 3025 (Part 4): 2021	1.0
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable		IS 3025 (Part 6): 1983, R: 2018	-
3	Taste	Agreeable	Agreeable	Agreeable		IS 3025 (Part 7): 1984	-
4	Turbidity, NTU	BDL	BDL	1	5	IS 3025 (Part 10): 1984; R: 2017	1.0 NTU
5	pH	7.98	7.97	6.5-8.5	No relaxation	IS 3025 (Part 11): 1983, R: 2017	2.0
6	Total Hardness	152.44	123.60	300	600	IS 3025 Part 21: 2009, R: 2019	4.0
7	Iron	BDL	BDL	0.3	No relaxation	IS 3025 (Part 53): 2003, R: 2019	0.06
8	Chlorides	15.31	22.77	250	1000	IS 3025 Part 32-1988, R: 2019	2.0
9	Residual Free Chlorine	0.03	0.02	0.2	1	APHA, 4500-Cl G. DPD Colorimetric	0.02
10	Dissolved Solids	235	280	500	2000	IS 3025 (Part 16): 1984, R: 2017	25.0
11	Calcium	31.37	37.97	75	200	IS 3025 Part 40 : 1991, R: 2019	1.60
12	Copper	BDL	BDL	0.05	1.5	APHA 3111B AAS Flame	0.03
13	Manganese	BDL	BDL	0.1	0.3	APHA 3111B AAS Flame	0.02
14	Sulphate	12.85	36.99	200	400	APHA, 4500-SO_4^{2-} E. Turbidimetric	2.0
15	Nitrate	5.48	18.37	45	No relaxation	APHA, 4500-NO_3^- B. UV-Spectrophotometric Screening	0.5
16	Fluoride	0.41	0.42	1	1.5	APHA, 4500 –F D. SPADNS	0.02
17	Selenium	BDL	BDL	0.01	No relaxation	APHA 3111B AAS Flame	0.002
18	Arsenic	BDL	BDL	0.01	0.05	APHA 3112B AAS VGA	0.002
19	Lead	BDL	BDL	0.01	No relaxation	APHA 3113B AAS GTA	0.005
20	Zinc	0.02	0.03	5	15	APHA 3111B AAS Flame	0.01
21	Hexavalent Chromium	BDL	BDL	0.05	0.05	APHA 3500B Colorimetric	0.01
22	Boron	BDL	BDL	0.5	1	APHA, 4500 B Curcumine	0.20
23	Coliforms (MPN)	Nil	Nil	Not Specified		APHA, 9221 B. Standard Total Coliform Fermentation	1.0
24	Phenolics	BDL	BDL	0.001	0.002	IS 3025 (Part 43): 2022	0.001
25	Alkalinity	154.86	112.14	200	600	IS 3025 Part 23: 1986, R: 2019	4.0
26	Cadmium	BDL	BDL	0.003	No relaxation	APHA 3113B AAS GTA	0.0005

*BDL- Below Detection Limit. *All values are expressed in mg/l unless specified.*

DRINKING WATER QUALITY

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman.

Name of station & code: **11DW11- RO plant at Chora Area Hospital**

Sl. No.	Parameters	Analytical Results	Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit
	Sample code	11DW11				
	Sampling Date	29-Mar-24	Acceptable Limit	Permissible Limit		
1	Colour, Hazen	3	5.0	15.0	IS 3025 (Part 4): 2021	1.0
2	Odour	Unobjectionable	Unobjectionable		IS 3025 (Part 6): 1983, R: 2018	-
3	Taste	Agreeable	Agreeable		IS 3025 (Part 7): 1984	-
4	Turbidity, NTU	BDL	1	5	IS 3025 (Part 10): 1984; R: 2017	1.0 NTU
5	pH	7.48	6.5-8.5	No relaxation	IS 3025 (Part 11): 1983, R: 2017	2.0
6	Total Hardness	37.08	300	600	IS 3025 Part 21: 2009, R: 2019	4.0
7	Iron	BDL	0.3	No relaxation	IS 3025 (Part 53): 2003, R: 2019	0.06
8	Chlorides	3.83	250	1000	IS 3025 Part 32-1988, R: 2019	2.0
9	Residual Free Chlorine	0.03	0.2	1	APHA, 4500-Cl G. DPD Colorimetric	0.02
10	Dissolved Solids	68	500	2000	IS 3025 (Part 16): 1984, R: 2017	25.0
11	Calcium	9.91	75	200	IS 3025 Part 40 : 1991, R: 2019	1.60
12	Copper	BDL	0.05	1.5	APHA 3111B AAS Flame	0.03
13	Manganese	BDL	0.1	0.3	APHA 3111B AAS Flame	0.02
14	Sulphate	BDL	200	400	APHA, 4500-SO_4^{2-} E. Turbidimetric	2.0
15	Nitrate	3.48	45	No relaxation	APHA, 4500-NO_3^- B. UV-Spectrophotometric Screening	0.5
16	Fluoride	0.32	1	1.5	APHA, 4500 –F D. SPADNS	0.02
17	Selenium	BDL	0.01	No relaxation	APHA 3111B AAS Flame	0.002
18	Arsenic	BDL	0.01	0.05	APHA 3112B AAS VGA	0.002
19	Lead	BDL	0.01	No relaxation	APHA 3113B AAS GTA	0.005
20	Zinc	0.06	5	15	APHA 3111B AAS Flame	0.01
21	Hexavalent Chromium	BDL	0.05	0.05	APHA 3500B Colorimetric	0.01
22	Boron	BDL	0.5	1	APHA, 4500 B Curcumine	0.20
23	Coliforms (MPN)	Nil	Not Specified		APHA, 9221 B. Standard Total Coliform Fermentation	1.0
24	Phenolics	BDL	0.001	0.002	IS 3025 (Part 43): 2022	0.001
25	Alkalinity	37.80	200	600	IS 3025 Part 23: 1986, R: 2019	4.0
26	Cadmium	BDL	0.003	No relaxation	APHA 3113B AAS GTA	0.0005

*BDL- Below Detection Limit. *All values are expressed in mg/l unless specified.*

NOISE LEVEL MONITORING

4.1 Location of sampling sites and their rationale

i) **Chora 10 UG (11N1)**: Noise level meter placed at Chora 10 UG pit - top to assess the noise level at workplace.

ii) **Lower Kenda UG (11N2)**: Noise level meter placed at Lower Kenda UG pit - top to assess the noise level at workplace.

iii) **Chora Block Incline (11N3)**: Noise level meter placed at Chora Block Incline UG pit - top to assess the noise level at workplace.

iv) **Chora 7 & 9 Pits (11N4)**: Noise level meter placed at Chora 7 & 9 UG pit - top to assess noise level at workplace.

v) **Bahula UG (11N5)**: Noise level meter placed at Bahula UG pit - top to assess the noise level at workplace.

vi) **C L Jambad UG (11N6)**: Noise level meter placed at C L Jambad UG pit - top to assess the noise level at workplace.

vii) **Siduli UG (11N7)**: Noise level meter placed at Siduli UG pit - top to assess the noise level at workplace.

viii) **Khandra UG (11N8)**: Noise level meter placed at Khandra UG pit - top to assess the noise level at workplace.

ix) **Shankarpur UG (11N9)**: Noise level meter placed at Shankarpur UG pit - top to assess the noise level at workplace.

x) **Shankarpur Phase 4 OCP (11N10)**: Noise level meter placed at mine site to assess the noise level at workplace.

xi) **New Kenda UG (11N11)**: Noise level meter placed at New Kenda UG pit - top to assess the noise level at workplace.

4.2 Methodology of sampling and analysis: Noise level monitoring is being carried out on quarterly basis at designated monitoring stations. The noise level is observed at the monitoring stations during day and night time. Noise level measurements are taken in form of 'Leq' using Integrated Data Logging Sound Level Meter. Noise levels are measured in decibels, 'A' weighted average, i.e. dB(A).

4.3 Results & Interpretations: The observed values of noise level measurements are compared with Noise Pollution (Regulation and Control) Rules, 2000. The observed values of noise level are as shown in table below:

NOISE LEVEL REPORT

Name of the Customer: Eastern Coalfield Limited, Borachak House, P.O.-Sitarampur, Distt.-Paschim Bardhaman, West Bengal.

Station Code	Station Name	Date of sampling	Sampling duration (hrs.)	Day – time Noise Level dB(A) Leq	Night – time Noise Level dB(A) Leq	Day – Night Noise Level dB(A) Leq
11N1	Chora 10 UG Pit Top	20-Feb-24	16.42 to 13.28	68.24	49.73	66.19
11N2	Lower Kenda Pit Top	22-Jan-24	16.08 to 13.26	62.54	59.50	61.62
11N3	Chora Block Incline Pit Top	24-Jan-24	14.47 to 13.06	67.35	51.42	65.45
11N4	Chora 7 & 9 Pit Top	21-Feb-24	16.37 to 13.28	68.34	51.26	66.31
11N5	Bahula UG Pit Top	22-Mar-24	17.26 to 13.57	73.54	49.37	71.33
11N6	C L Jambad UG Pit Top	18-Mar-24	16.38 to 14.18	67.34	52.71	65.46
11N7	Siduli UG Pit Top	21-Mar-24	15.49 to 13.25	71.82	53.68	69.89
11N8	Khandra UG Pit Top	19-Mar-24	17.84 to 13.22	69.37	54.61	67.10
11N9	Shankarpur UG Pit Top	20-Mar-24	15.34 to 12.49	72.58	47.36	70.51
11N10	Shankarpur Phase IV OCP	23-Feb-24	15.38 to 13.46	66.52	51.73	64.64
11N11	New Kenda UG Pit Top	22-Feb-24	16.44 to 13.51	74.35	52.36	72.28

Noise Pollution (Regulation and Control) Rules published in Gazette of India, vide S. O. 123 (E) dated 14.02.2000 under Environment Protection Act, 1986.

Station Category	Limits for noise (Leq dB (A))	
	Day Time: 6.00 AM to 10.00 PM	Night Time: 10.00 PM to 6.00 AM.
Industrial	75.0	70.0
Commercial	65.0	55.0
Residential	55.0	45.0
Silence Zone	50.0	40.0