

**BEFORE THE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE, CHENNAI**

ORIGINAL APPLICATION No. 39 OF 2022 (SZ)

IN THE MATTER OF:

Gedam Dilip Kumar,
Telangana & another

....

Applicant(s)

Versus

The Singareni Collieries Company Ltd.,
rep by its Chairman & Managing Director,
Telangana & Others

....

Respondent(s)

REPORT OF THE TELANGANA STATE POLLUTION CONTROL BOARD (R4)

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Place: Hyderabad.

Date: 06-02-2023.

①

REPORT DATED 06.02.2023 OF THE ENVIRONMENTAL ENGINEER, REGIONAL OFFICE, NIZAMABAD ON HON'BLE NATIONAL GREEN TRIBUNAL, CHENNAI IN ORIGINAL APPLICATION NO. 39 OF 2022 FILED BY GEDAM DILIP KUMAR & ANOTHER, R/O.VULLIPITTA (V), TIRYANI (M), KOMURAM BHEEM ASIFABAD DISTRICT, TELANGANA STATE.

①

It is to submit that Sri Gedam Dilip Kumar & another, R/o.Vullipitta (V), Tiryani Mandal, Komuram Bheem Asifabad District have filed an application before the Hon'ble National Green Tribunal, Southern Zone, Chennai (Application No. 39 of 2022) against M/s. Singareni Collieries Company Ltd., regarding air pollution and dust nuisance caused by Khairagura Open Cast Mine at Bellampally Area of Komurambheem Asifabad District.

In this regard, Hon'ble NGT, Chennai vide order dated 11.01.2023 directed the TSPCB to file fresh report duly considering the violations observed by the Joint Committee and subsequent measure carried out by project proponent.

In this regard, a notice was issued by TSPCB to the industry on 25.01.2023 to submit their reply on the non compliances observed on the EC conditions reported by the Joint committee along with corrective measures taken to control the pollution after the visit of the joint committee. A copy of the notice issued by TSPCB is enclosed as **Annexure-I**.

The Respondent industry has submitted reply to the notice vide letter Dated 30.01.2023 on the violations observed by the Joint Committee. A copy of the reply given by the industry is enclosed as **Annexure-II**.

Further this office has inspected the industry on 02.02.2023 and verified the compliance of the violated EC conditions. The status of the compliance is as follows:

1. ***"As per the EC condition No. iii, coal shall be transported on road by mechanically covered trucks, but project proponent is covering the coal transportation vehicles with tarpaulin."***

Compliance: SCCL is manually covering the coal laden trucks with tarpaulin cloth so as to avoid spillage of coal and to control fugitive emissions during transportation. SCCL has informed that earlier they have used mechanically covered tarpaulin trucks on a trial basis. However, technical problems were encountered during operation and maintenance of such trucks due to frequent failure of hydraulic mechanism. In the event of non-availability of mechanically covered trucks, SCCL also informed that they proposed to approach MoEF&CC for amendment to the existing EC condition for stipulating the condition to cover the trucks. Further, M/s. SCCL is continuously monitoring the Ambient Air Quality in the mine and surrounding villages.

M/s. SCCL has installed 3 no. of Ambient Air Quality Monitoring stations and 1 no. Online Continuous Ambient Air Quality Monitoring station in Core Zone and 4 no. of Ambient Air Quality Monitoring stations in the Buffer zone. The PM₁₀ µg/m³ value in the core zone are within the limit against the standard of 250 µg/m³ and the value in the Buffer zone (surrounding villages) are within the limit against the standard of 100 µg/m³. The locations of the Ambient Air Quality Monitoring stations along with the values are furnished below:

Station Code	Name of the Stations	Range	Standard
CA1	KHA OCP Project Office	161 - 167 µg/m ³	250 µg/m ³
CA2	KHA OCP Weigh Bridge	169 - 164 µg/m ³	
CA3	KHA OCP CAAQMS	65 - 101 µg/m ³	
CA4	KHA OCP Weigh Bridge 2	162 - 183 µg/m ³	

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BA1	Goveriguda Village	48 - 60 $\mu\text{g}/\text{m}^3$	100 $\mu\text{g}/\text{m}^3$
BA2	Ullipitta Dorli Village	45 - 59 $\mu\text{g}/\text{m}^3$	
BA3	Pathibanda Village	40 - 55 $\mu\text{g}/\text{m}^3$	
BA10	Rehabilitated Dorli Village	40 - 51 $\mu\text{g}/\text{m}^3$	

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The ambient air quality in the core & buffer zones of the Khairaguda OCP are meeting the standards as stipulated by SPCB/MoEF&CC.

2. ***"As per EC Condition No. xxiii, the proponent has to construct embankment with stone pitching and stabilised plantation to withstand peak water flow and prevent mine inundation, however the proponent has provided earthen bund only."***

Compliance: During the Joint Inspection it was observed that Ms SCCL has constructed earthen bund only along the Vattivagu Reservoir. However, After the visit of Joint Inspection M/s. SCCL has constructed earthen bund of 3.2 km length and strengthened by stone pitching on the river front side along Vattivagu reservoir to withstand peak water flow and to prevent mine inundation. A CC toe wall is constructed along the earthen bund. The earthen embankment was stabilised with plantation.

3. ***"As per EC Condition No. xxiv, the project authority has to take mitigative measures for over flow of OB in to the river and nearby agricultural fields. But, soil erosion and over flow of the OB near Vatti vagu reservoir was observed."***

Compliance: Ms SCCL has constructed deck drains, garland drains, earthen bund, check dams and settling ponds around D3 dump to prevent OB runoff into the Vattivagu reservoir and adjacent villages. No soil erosion and flooding was observed in the nearby agricultural fields and Ullipitta Village. Presently the D-3 dump is inactive and stabilized with plantation.

4. ***"As per the EC condition No. xxvi, the project proponent has provided garland drains & siltation ponds to arrest silt and sediment from OB and mineral dump. However, the project proponent has to provide additional garland drains & siltation ponds with increased capacity in case of heavy rainfall, as per the joint inspection report."***

Compliance: Ms SCCL has constructed deck drains, garland drains, earthen bund, check dams and settling ponds to prevent overflow of OB. The drains and checkdams are de-silted and maintained properly. Eight no. of settling ponds of size 30m x 30m x 2m followed by six check dams are provided to arrest silt and sediment from dumps. SCCL has constructed three (3) additional siltation ponds (100 m X 50 m X 2m) of capacity 22 lakh gallons are provided near D3 dump for further strengthening to control soil erosion.

- Provided garland drain for a length of 6.6 km, deck drains of 5.1 km length on first deck terrace, 4.44 km length on second deck terrace at Dump-1.
- Provided garland drains for a length of 3.8 km, deck drains of 3.42 km length on first deck terrace, 2.21 km length on second deck terrace at Dump-2.
- Provided garland drains for a length of 6.61 km, deck drains of 6.64 km length on first deck terrace, 4.10 km length on second deck terrace at Dump-3.
- Provided garland drains for a length of 1 km, deck drains of 840m length on first deck terrace, 850m length on second deck terrace deck drains 1km length on 3rd deck terrace at Internal dump.
- 8 km length of garland drain is provided around the quarry.

5. Observation: "As per the EC ³ condition No. xxvii, the proponent has provided retaining wall at the toe of the dumps and OB benches. However, erosion was observed at the retaining walls".

Compliance: Ms SCCL has constructed earthen bund all along the toe of the dumps and further strengthened with stone retaining wall. No erosion was observed.

6. "As per the EC condition No. xli, the project proponent shall construct STP to treat the sewage of the colony. However, the proponent has not provided full fledged STP for treating the sewage".

Compliance: M/s. SCCL has informed that order was placed to M/s. MECO Technologies Pvt. Ltd., Bilaspur, Chattisgarh for establishment of STP, but the firm delayed the process and did not complete the work. Subsequently, M/s. SCCL has cancelled the order and fresh order was placed on M/s. Sharp Engineer Works, Secunderabad for establishment of STP.

Presently, M/s. SCCL Goleti township sewage is treated in conventional method i.e., septic tanks followed by soak pits. Ms SCCL has informed that sewage treatment plants (2X100 KLD) will be completed within three months..

Status Report:

Further, M/s. SCCL has taken up the following measures for controlling Air & Water pollution in the Khairaguda OCP mine.

- Mobile water sprinklers are being deployed for dust suppression on haul roads and approach roads, dumps, coal transport road, etc.
- Crusher house, Conveyors, Transfer points, Discharge hoppers, etc., are closed with GI Sheets.
- Mist sprayer is provided at Crusher of Pit Head Coal Handling Plant (CHP).
- Sensor operated wetting point is provided to wet coal loaded dumpers, before unloading into crushers.
- Fixed point water sprinkling arrangement is provided along permanent haul roads, crushers, around pre-weigh bin.
- Coal transport trucks covered with tarpaulin for avoiding coal spillage on the transport route.
- Pre-weigh bin truck dispatch system is provided to reduce the dust during loading of trucks.
- Wet drilling is being adopted
- The Base Workshop vehicle wash effluent and CHP waste water are being treated in 2 ETPs and the treated water is being utilized for internal purposes like dust suppression and plantation
- Excess mine discharge water after necessary treatment in slow sand filter bed/sedimentation tank treated water used for domestic purpose.
- M/s. SCCL is regularly collecting and analysing the water samples from the 8 following locations:
 - (i) Vatti Vagu U/S
 - (ii) Vatti Vagu D/S
 - (iii) Ullipitta Dorli Village
 - (iv) Pathibanda Village
 - (v) Khairagura Expansion OCP Mine Discharge
 - (vi) Khairagura Expansion OCP OB Dump Surface Runoff-Settling Pond Outlet
 - (vii) Khairagura Expansion OCP Base Workshop ETP Outlet
 - (viii) Khairagura Expansion OCP CHP ETP Outlet

- ④
- One Continuous Ambient Air Quality Monitoring Station (CAAQMS) was established in core zone and the data is being uploading to the TSPCB website on real time basis and the monitored parameters are well within the Standards stipulated for coal mines vide Notification No. GSR 742 (E) , dated 25th September 2000. ④
 - Ambient air, water, noise samples are being monitored in the project area falling in core zone and villages falling in buffer zone through a third party agency i.e EPTRI, Hyderabad, a CPCB recognized and NABL accredited laboratory and the data reports are periodically submitted to TSPCB. The monitored values are within permissible limits in the project area as well as in surrounding villages.

The Ambient Air Quality, water sample reports are conforming to the stipulated standards prescribed by the SPCB / MoEF&CC and enclosed as **Annexure-III**.



ENVIRONMENTAL ENGINEER

TSPCB, REGIONAL OFFICE, NIZAMABAD.

Date: 06.02.2023

Place: Nizamabad.



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TELANGANA STATE POLLUTION CONTROL BOARD

Regional Office, Door No: 6-2-166/A, Subashnagar, Nizamabad - 503 002

ANNEXURE - I

Tele - No: 08462-237774

e- mail: ee-nzb-tspcb@telangana.gov.in

Website: www.tspcb.cgg.gov.in

Lr.No. 2807/PCB/RO/NZB/W&A/2022- 44

Date: 25.01.2023

NOTICE

(Reg. Post with ACK due)

Sub: TSPCB-RO-NZB - M/s.Singareni Collieries Co. Ltd., Khairaguda OCP Expansion Project, Borjam (V), Tiryani (M), Komurambheem Asifabad District – **Non Compliance of EC Conditions – Notice - Issued – Reg.**

Ref: 1. EC order No.J-11015/28/2013-IA-II(M), Dt.06.02.2015.
2. CFO Order No. TSPCB/RCP/NZB/HOW&A/2017-854, Dt:12.11.2022.
3. O.A. No. 39 of 2022 (SZ) filed in the Hon'ble NGT Chennai.
4. Joint Committee report Dt.05.08.2022.
5. NGT order Dt.11.01.2023.

###

WHEREAS you are operating the coal mine in the name and style of M/s.Singareni Collieries Co. Ltd., Khairaguda OCP Expansion Project, Borjam (V), Tiryani (M), Komurambheem Asifabad District and engaged in manufacturing of Coal by Open cast mining of capacity 3.75 Million TPA.

WHEREAS the MoEF&CC, Gol has accorded Environmental Clearance for expansion of Coal mining project from 3.0 MTPA to 3.75 MTPA vide reference 1st cited duly stipulating conditions to comply.

WHEREAS the Board has issued Consent for Operation (CFO) under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and under section 21/22 of the Air (Prevention & Control of Pollution) Act, 1981 and stipulated conditions to comply vide reference 2nd cited.

WHEREAS vide reference 3rd cited, a case was filed in O.A No. 39 of 2022 (SZ) filed in the Hon'ble NGT Chennai by Sri Gedam Dilip Kumar & Others, R/o Ullipitta (V), Tiryani (M), Komurambheem Asifabad District against the mining activity for causing air pollution and dust nuisance in the surrounding areas.

The Hon'ble NGT has constituted a Joint Committee to submit a factual report as well as action taken report if any violations found. The Joint Committee has submitted the report on 05.08.2022.

The Hon'ble NGT Chennai in its order dt.11.01.2023, has observed non-compliances from the Joint Committee report dt.05.08.2022, with respect to the Environmental Clearance conditions stipulated in the EC order dt.06.02.2015:

- i. As per the EC condition No.iii coal shall be transported on road by mechanically covered trucks, but the project proponent is covering the coal transportation vehicles with tarpaulin.
- ii. As per the EC condition No.xxiii the proponent has to construct embankment with stone pitching and stabilized plantation to with stand peak water flow and prevent mine inundation, however the proponent has provided earthen bund only.

- ⑥
- iii. As per the EC condition No.xxiv the project authority has to take measures for over flow of OB in to the river and nearby agricultural fields. But, soil erosion and over flow of the OB near Vattivagu reservoir was observed.
 - iv. As per the EC condition No.xxvi the project proponent has provided garland drains & siltation ponds to arrest silt and sediment from OB & mineral dump. However, the project proponent has to provide additional garland drains & siltation ponds with increased capacity in case of heavy rainfall, as per the joint inspection report.
 - v. As per the EC condition No. xxvii the proponent has provided retaining wall at the toe of the dumps and OB benches. However, erosion was observed at the retaining walls.
 - vi. As per the EC condition No.xli the project proponent shall construct STP to treat the Sewage of the colony. However, the project proponent has not provided full fledged STP for treating the sewage.

WHEREAS the mine management has failed to take measures to control pollution due to the mining operations thus violating the Environmental Clearance conditions in the EC order dt.06.02.2015 issued by the MoEF&CC, GoI and causing pollution to the surrounding areas.

Your reply to this notice along with corrective measures taken to control the pollution after the visit of the joint committee should reach to this office within a week from the date of receipt of this notice duly rectify the above lapses failing which the Board will constrained to take action against your industry in the interest of public Health & Environment.

To
M/s.Singareni Collieries Co. Ltd.,
Khairaguda OCP Expansion Project,
Borjam (V), Tiryani (M),
Komurambheem Asifabad District.


ENVIRONMENTAL ENGINEER
ENVIRONMENTAL ENGINEER
T.S. Pollution Control Board
Regional Office, Nizamabad.



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THE SINGARENI COLLIERIES COMPANY LIMITED
(A GOVERNMENT COMPANY)
BELLAMPALLI AREA

ANNEXURE - II

Ref. No. BPA/ENV/59/2023/06

Date: 30 .01.2023

To

**Environmental Engineer,
Regional Office, Nizamabad,
Telangana State Pollution control Board.**

Sub: TSPCB-RO-NZB- M/s Singareni Collieries Company Ltd., Khairagura
OCP Expansion project, Borjam (V), Tiryani (M), Komurambheem
Asifabad District - Non-compliance of EC conditions - Reply to notice -
Reg.,

Ref: Lr. No. 2807/PCB/RO/NZB/W&A/2022 - 44, dt. 25.01.2023

With reference to the subject cited, RO, Nizamabad, TSPCB issued a notice to the project authorities of Khairagura OCP Expansion regarding non-compliance of some of the EC conditions in connection with a case filed in Hon'ble NGT, Chennai (SZ) vide OA No. 39 of 2022.

In this connection, a brief report on the additional mitigation measures implemented in Khairagura Opencast Expansion Coal Mining Project of M/s. Singareni Collieries Company Limited (SCCL) with regard to the observations made by the joint committee on partial compliances of some of the EC conditions after inspection of the project on 27.04.2022 and the violations as pointed out by Hon'ble NGT, Chennai (SZ) in its order dated 11.01.2023 in OA No. 39 of 2022 is furnished hereunder.

1. Observation: "As per the EC condition No. iii, coal shall be transported on road by mechanically covered trucks, but project proponent is covering the coal transportation vehicles with tarpaulin."

Implementation status: SCCL has been making continuous efforts for procurement of mechanically covered trucks for transportation of coal by road mode. SCCL deployed mechanically covered tarpaulin trucks in opencast mines on a trial basis. However, technical problems were encountered during operation and maintenance of such trucks due to frequent failure of hydraulic mechanism. Hence, company is searching for truck manufacturers who can supply vehicles with better mechanism and consistent performance. Presently, SCCL is adopting the system of manually covering the coal laden trucks with tarpaulin cloth so as to avoid spillage of coal during transportation. In order to ensure covering of coal transport trucks with tarpaulin cloth, a security check

has been arranged at coal dispatch points within the project premises. By maintaining the present system of coal transport in tarpaulin covered trucks, the desired objective of controlling fugitive dust emissions has been fulfilled and the ambient air quality in the surrounding villages is also meeting the standards as stipulated by MoEF&CC/CPCB. Air quality monitoring data is enclosed as Annexure. In the event of non-availability of mechanically covered trucks, SCCL is contemplating to approach MoEF&CC for amendment to the existing EC condition.

The present system of coal transportation through tarpaulin covered trucks is depicted in the following photographs for kind perusal.



Coal transport Lorries with Tarpaulin sheet

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II. Observation: "As per EC Condition No. xxiii, the proponent has to construct embankment with stone pitching and stabilised plantation to withstand peak water flow and prevent mine inundation, however the proponent has provided earthen bund only."

Implementation status: An earthen bund of 3.2 km length is made all along Vattivagu reservoir to withstand peak water flow and to prevent mine inundation. The earthen bund has dimensions of top width-10 m., bottom width-16 m. and height- 3 m. above HFL.

A CC toe wall is constructed along the earthen bund and strengthened by stone pitching on the river front side. The earthen embankment has also been stabilised with extensive plantation.

Photographs depicting earthen bund with stone pitching, CC toe wall and plantation works taken up in the project are furnished hereunder:



Earthen bund with stone pitching along Vattivagu reservoir



CC toe wall along the earthen bund



Plantation on the earthen bund

(11)

III. Observation: "As per EC Condition No. xxiv, the project authority has to take mitigative measures for over flow of OB in to the river and nearby agricultural fields. But, soil erosion and over flow of the OB near Vatti vagu reservoir was observed."

Implementation status: The dumping activity in D-3 dump was completed in February 2022. The D3 dump has been stabilized with plantation. Various measures like deck drains, garland drains, earthen bund, check dams and settling ponds have been taken up around D3 dump to prevent OB runoff into the Vattivagu reservoir and into the adjacent villages. The garland drains, deck drains, check dams etc., are being regularly de-silted during pre-monsoon season every year and maintained properly. During recent heavy rains between 9th and 13th July, in subsequent months of August & September 2022, there was no soil erosion and flooding into nearby agricultural fields and Ullipitta Village.

Further, in order to strengthen drainage system in Ullipitta Village, SCCL has strengthened 200 m length of nallah with suitable dimensions, 2 nos. of box culverts and 1 no. hume pipe culvert are also constructed. Photographs depicting stabilized D3 dump, garland drains, box culvert, nallah strengthening near village, drains, and agriculture fields near D3 Dump are furnished hereunder:



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Box culvert constructed by SCCL in Ullipitta village

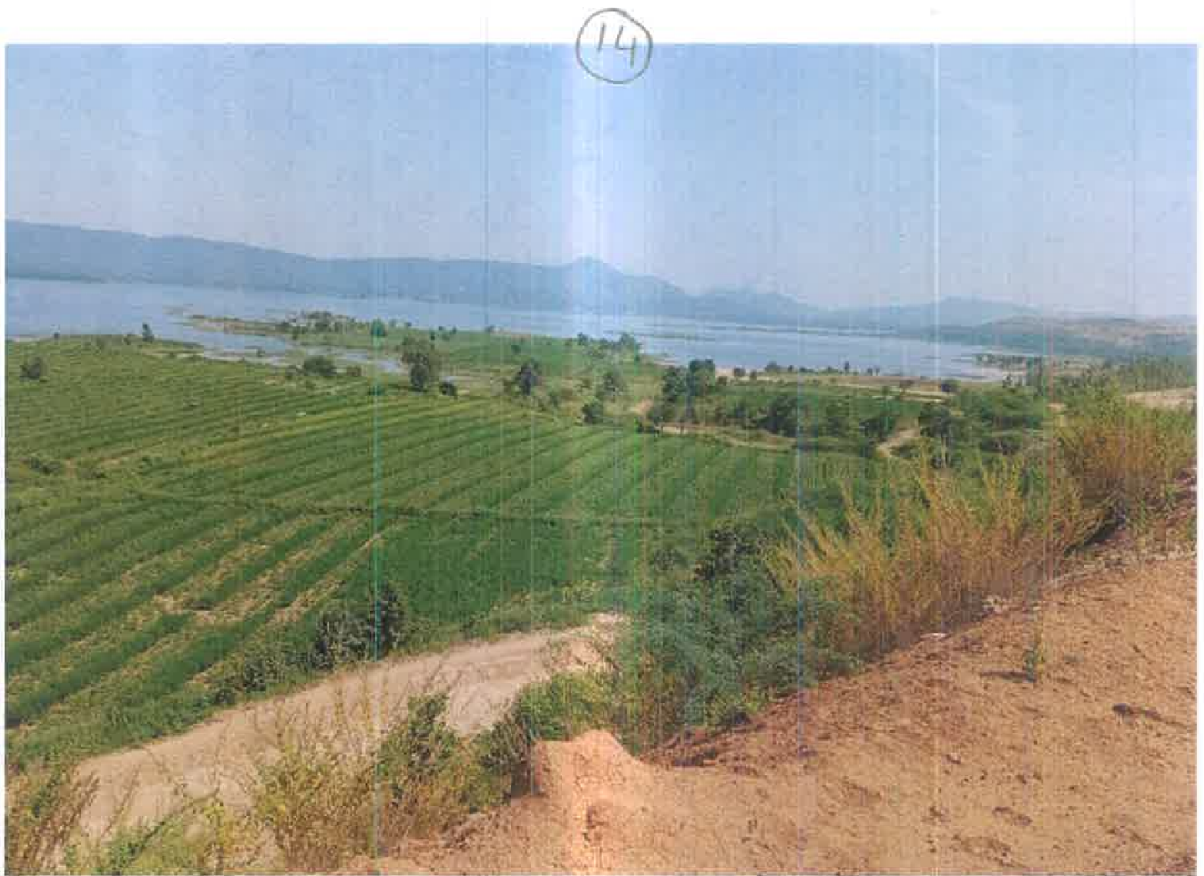




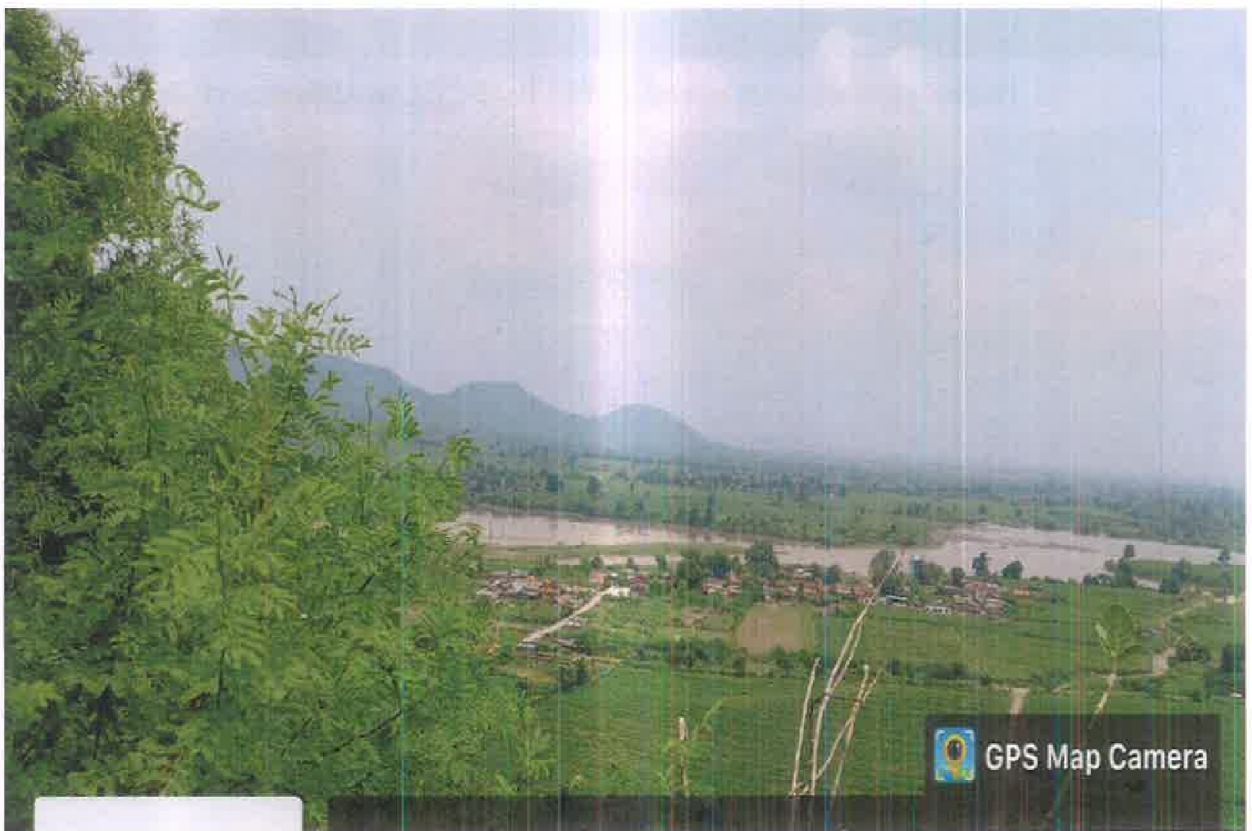
Hume pipe culvert constructed by SCCL in Ullipitta village



Deck drain at 1st deck of D-3 Dump



Agriculture fields near D-3 Dump adjacent to Ullipitta village



Agriculture fields near D-3 Dump adjacent to Ullipitta village

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IV. Observation: "As per the EC condition No. xxvi, the project proponent has provided garland drains & siltation ponds to arrest silt and sediment from OB and mineral dump. However, the project proponent has to provide additional garland drains & siltation ponds with increased capacity in case of heavy rainfall, as per the joint inspection report."

Implementation status: Various measures like deck drains, garland drains, earthen bund, check dams and settling ponds were provided on dumps to prevent overflow of OB. The garland drains, deck drains, check dams etc., are being regularly de-silted and maintained properly.

Also, following soil erosion control measures are taken up in the project:

- Provided garland drain for a length of 6.6 km, deck drains of 5.1 km length on first deck terrace, 4.44 km length on second deck terrace at Dump-1.
- Provided garland drains for a length of 3.8 km, deck drains of 3.42 km length on first deck terrace, 2.21 km length on second deck terrace at Dump-2.
- Provided garland drains for a length of 6.61 km, deck drains of 6.64 km length on first deck terrace, 4.10 km length on second deck terrace at Dump-3.
- Provided garland drains for a length of 1 km, deck drains of 840m length on first deck terrace, 850m length on second deck terrace deck drains 1km length on 3rd deck terrace at Internal dump.
- 8 km length of garland drain is provided around the quarry.
- Eight (8) settling ponds of size 30m x 30m x 2m are made followed by six check dams to arrest silt and sediment flows from dumps.

Recently, three (3) additional siltation ponds (100 m X 50 m X 2m) each with a capacity of 22 lakh gallons were also made near D3 dump recently for further strengthening of soil erosion control measures.

Photographs depicting additional siltation ponds constructed along the D3 dump and the Garland drains are shown hereunder:



Garland drain along D-3 Dump



Three additional siltation ponds made along D-3 dump

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Three additional siltation ponds along D-3 dump



Stabilised D-3 Dump with plantation



Check dam beside D-2 Dump



Settling pond beside D-2 Dump

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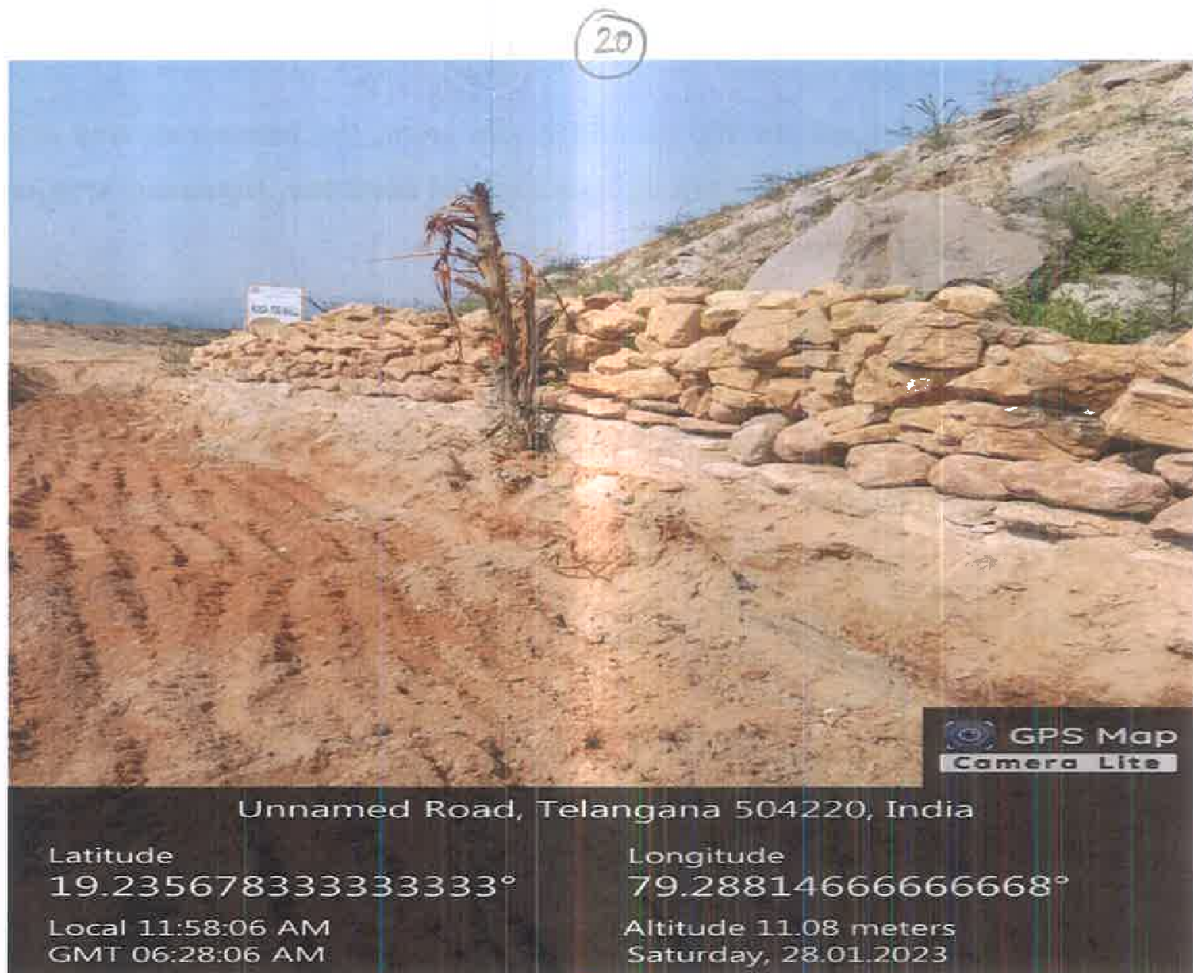
V. Observation: "As per the EC condition No. xxvii, the proponent has provided retaining wall at the toe of the dumps and OB benches. However, erosion was observed at the retaining walls".

Implementation status: An earthen bund is provided all along the toe of the dumps with dimension of base width 5m, top width 3m and height 3m.

In addition to the above, stone retaining wall has also been provided along the dump and silt is being removed periodically.



Earthen bund along D3 Dump towards Ullipitta side



Stone retaining wall made at the toe of the dump

VI. Observation: *"As per the EC condition No. xli, the project proponent shall construct STP to treat the sewage of the colony. However, the proponent has not provided full fledged STP for treating the sewage".*

Implementation status: Presently, the colony sewage is being treated in conventional method i.e., septic tanks followed by soak pits. In addition, portable sewage treatment plant (2X100 KLD) is also under construction in Goleti Colony and will be completed within three months.

Previously, a firm order was placed on M/s MECO Technologies Pvt. Ltd., Bilaspur, Chattisgarh for establishment of STP in Goleti Colony but the firm did not complete the work. This has delayed the process of establishing a STP in the colony. Subsequently, the earlier firm order had to be cancelled and a fresh order was placed on M/s Sharp Engineering Works, Secunderabad for establishment of portable STP.

(21)

The latest implementation status of pollution mitigation measures at Khairagura Opencast Expansion Project is furnished hereunder:

SCCL is taking air pollution control measures in Khairagura Open Cast Expansion Project to control fugitive dust emissions and to meet prescribed standards.

- Mobile water sprinklers are being deployed in every shift for dust suppression on haul roads and approach roads, dumps, coal transport road, etc.



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- Vehicular emissions are being monitored for HEMM at a frequency of once in six months. Maintenance & engine tuning of the vehicles is being carried out at regular intervals to control fuel exhaust emissions.



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The crusher house, conveyors, transfer points, discharge hoppers, etc, are closed with G.I. sheets to the extent possible to control the dust generation.



A mist sprayer is provided at crusher of pit head coal handling plant.



- A sensor operated wetting point is provided to wet coal loaded dumpers. 24



- Fixed point water sprinkling arrangement is provided along permanent haul roads.



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- So far 15,63,294 Nos. of plants were planted in an area of 427.23 Ha. up to 30.09.2022



Stabilised D-3 Dump with plantation



Plantation on earthen bund

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Plantation at site office



Avenue plantation along road

- Pre-weigh bin truck dispatch system is provided at this project to reduce dust during loading of trucks.



- Dust masks are being provided to all the workmen to protect them from exposure to dust. About 550 nos. of dust masks were issued to employees of Khairagura OCP during January-December 2022



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- The wet drilling is being adopted.



SCCL is taking following water pollution control measures in Khairagura Open Cast Expansion Project:

- A washing platform is constructed near base workshop for washing of HEMM and other vehicles.



- ETP (60KL capacity) constructed near base workshop & pit head CHP for removal of silt, oil & grease.



- The washing effluents generated from washing platform of the workshop are being treated in Effluent Treatment Plant (ETP) provided for the purpose. Treated water is being used for dust suppression at the mine.

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- Excess mine discharge water after necessary treatment in slow sand filter bed/sedimentation tank treated water used for domestic purpose.



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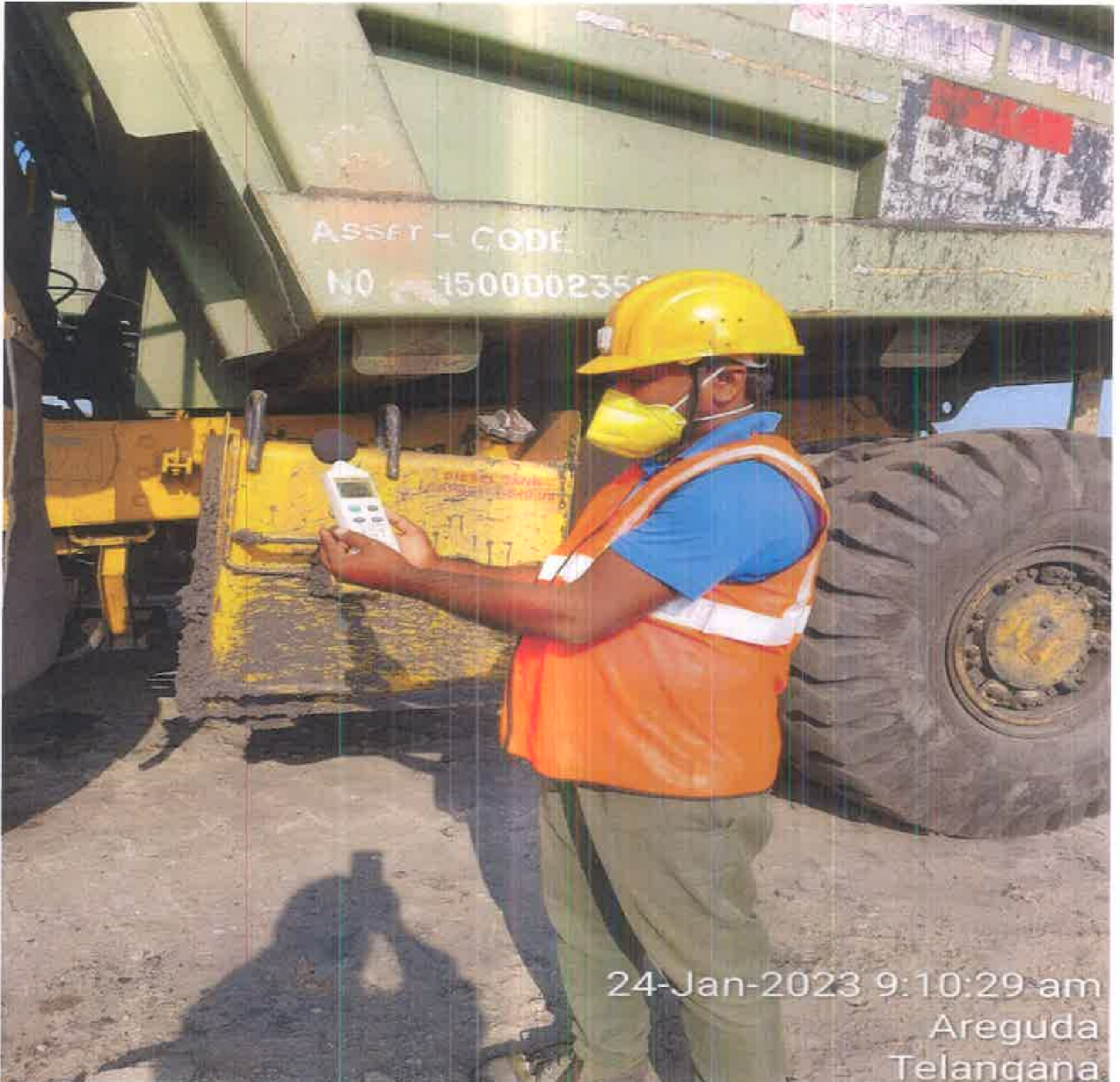
SCCL is taking following noise pollution control measures in Khairagura Open Cast Expansion Project

- Sound proof cabins are provided in the HEMM.



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- Monitoring of noise level mapping is being done regularly and record is being maintained.



33

- Planned preventive maintenance of HEMM & other vehicles is being done at regular intervals to control noise.
- Speed limits are fixed for HEMM/vehicles to control the noise.



- Regular fine tuning of engines is being done to reduce the noise.
- In order to control impact due to noise, height of fall of coal is kept at minimum.
- Controlled blasting technique with NONELs is being practiced to control noise and vibrations.



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- Plantation is being carried out every year on dumps, in the vacant places, along the roads and around the project which helps in noise attenuation.



Avenue plantation



D3 dump plantation near Ullipitta village

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It is requested to consider the corrective measures taken up by SCCL for control of pollution in the Khairagura Opencast Project and condone any action in this regard.

[Signature]
General Manager
Bellampalli Area

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ANNEXURE - III

KHAIRAGURA OPENCAST EXPANSION MINE PPEM stations as per new work order
Effective from sept-2022
Air Monitoring Locations

Station Code	Name of the Stations	Latitude	Longitude
CA1	KHA OCP Project Office	N 19° 14' 07.8"	E 79° 17' 06.5"
CA2	KHA OCP Weigh Bridge	N 19° 14' 09"	E 79° 17' 02"
CA3	KHA OCP CAAQMS	N 19° 14' 14.3"	E 79° 17' 57.8"
CA4	KHA OCP Weigh Bridge 2	N 19° 14' 01"	E 79° 17' 42"
BA1	Goveriguda Village	N 19° 13' 55.6"	E 79° 16' 46.4"
BA2	Ullipitta Dorli Village	N 19° 16' 44.4"	E 79° 14' 29.8"
BA3	Pathibanda Village	N 19° 17' 49.4"	E 79° 15' 01.7"
BA4	Rehabilitated Dorli Village	N 19° 17' 21.3"	E 79° 14' 04.1"

Water Sampling Locations

Station Code	Name of the Stations	Latitude	Longitude
SW1	Vatti Vagu U/S	N 19° 14' 53.0"	E 79° 16' 03.1"
SW2	Vatti Vagu D/S	N 19° 17' 35.7"	E 79° 15' 23.1"
GW1	Ullipitta Dorli Village	N 19° 16' 44.6"	E 79° 14' 29.6"
GW2	Pathibanda Village	N 19° 17' 49.3"	E 79° 15' 02.2"
EW1	Khairagura Expansion OCP Mine Discharge	N 19° 14' 5.6"	E 79° 17' 5.8"
EW2	Khairagura Expansion OCP OB Dump Surface Runoff-Settling Pond Outlet	N 19° 14' 20.1"	E 79° 17' 25.2"
EW3	Khairagura Expansion OCP Base Workshop ETP Outlet	N 19° 14' 7.1"	E 79° 17' 2.2"
EW4	Khairagura Expansion OCP CHP ETP Outlet	N 19° 14' 15.7"	E 79° 17' 20.9"

Noise Monitoring Locations

Station Code	Name of the Stations	Latitude	Longitude
CN1	KHA OCP Project Office	N 19° 14' 07.8"	E 79° 17' 06.5"
CN2	KHA OCP Weigh Bridge	N 19° 14' 07.5"	E 79° 17' 04.4"
BN1	Ullipitta Dorli Village	N 19° 16' 44.4"	E 79° 14' 29.8"
BN2	Pathibanda Village	N 19° 17' 49.4"	E 79° 15' 01.7"

Note: CA= Core zone Air monitoring station
CN= Core zone Noise monitoring station
SW= Surface water monitoring station
GW= Ground Water monitoring station
EW= effluents in water monitoring station

BA= Buffer zone Air monitoring station
BN= Buffer zone Noise monitoring station

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Khairagura OC Ambient air quality monitoring data

Sampling interval: Once in fortnight

Sampling duration: 24 hours

Ambient Air Quality at KHA OCP Project Office(CA1)					
Sl. No.	Date of Sampling	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO ₂ (µg/m ³)
Coal mine standards,GSR 742(E), dt.25.09.2000		250.0	-	120.0	120.0
1.	09.09.2022	174	68.8	17.1	20.6
2.	24.09.2022	170	66.1	16.9	19.9
3.	11.10.2022	165	55	16.3	19.4
4.	27.10.2022	161	59	17	20.1
5.	10.11.2022	166	59.5	17.6	20.7
6.	25.11.2022	173	61.5	18	21.3
7.	10.12.2022	177	65	18.6	21.7
8.	26.12.2022	171	66.1	17.9	20.5
Min		161.0	55.0	16.3	19.4
Max		177.0	68.8	18.6	21.7
Average		169.6	62.6	17.4	20.5
- No standard was specified for PM _{2.5} in core zone.					

Ambient Air Quality at KHA OC BWS/Weighbridge(CA2)					
Sl. No.	Date of Sampling	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO ₂ (µg/m ³)
Coal mine standards,GSR 742(E), dt.25.09.2000		250	-	120	120
1.	09.09.2022	171	67.8	17	20.8
2.	24.09.2022	169	64.4	16.5	20
3.	11.10.2022	171	64.4	17.6	20.8
4.	27.10.2022	181	69	18.1	21.2
5.	10.11.2022	185	74.4	18.5	21.6
6.	25.11.2022	189	75.6	18.8	22
7.	10.12.2022	194	76.3	19.1	22.3
8.	26.12.2022	190	79.3	18.8	21.7
Min		169.0	64.4	16.5	20.0
Max		194.0	79.3	19.1	22.3
Average		181.3	71.4	18.1	21.3
- No standard was specified for PM _{2.5} in core zone.					

CAAQMS in (CA3)Core Zone MONITORING DATA DEC-2022 (DAILY AVERAGE)

Parameter	SO2	NOx	PM2.5	PM10
Unit	ug/m3	ug/m3	ug/m3	ug/m3
Limit	0.00 - 120.00	0.00 - 120.00	0.00 - 120.00	0.00 - 250.00
01/12/2022	18.25	14.46	31.61	68.79
02/12/2022	10.09	14.36	31.32	68.81
03/12/2022	8.56	14.36	30.9	69.79

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04/12/2022	19.69	14.36	31.77	69.18
05/12/2022	13.14	14.36	31.35	69.92
06/12/2022	13.12	14.36	31.32	70.2
07/12/2022	13.66	14.59	31.25	68.42
08/12/2022	8.03	14.3	31.22	67.68
09/12/2022	11.5	14.36	31.21	65.8
10/12/2022	10.07	14.36	31.36	66.65
11/12/2022	9.36	14.36	31.67	65.5
12/12/2022	8.62	14.36	31.24	66.41
13/12/2022	7.87	14.36	31.25	69.7
14/12/2022	7.96	14.36	31.08	70.2
15/12/2022	9.63	14.31	30.82	69.9
16/12/2022	10.26	14.95	31.35	82.06
17/12/2022	12.81	14.47	31.21	89.68
18/12/2022	14.69	14.36	30.89	69.7
19/12/2022	11.61	14.36	31.24	68.7
20/12/2022	16.31	14.36	31.46	68.3
21/12/2022	11.21	14.36	31.86	69.1
22/12/2022	9.05	14.36	30.68	89.71
23/12/2022	11.6	14.44	33.14	91.76
24/12/2022	13.8	14.94	31.67	90.81
25/12/2022	16.74	15.18	31.52	101.5
26/12/2022	11.91	14.36	31.18	92.44
27/12/2022	20.17	14.29	31.08	98.84
28/12/2022	9.38	14.93	30.77	81.46
29/12/2022	10.89	15.83	31.13	82.09
30/12/2022	12.32	15.44	32.28	88.26
31/12/2022	12.58	14.36	30.5	93.03
Min	7.87	14.29	30.5	65.5
Max	20.17	15.83	33.14	101.5
Average	12.09	14.53	31.3	76.91

Ambient Air Quality at KHA OC BWS/Weighbridge-2(CA4)					
Sl. No.	Date of Sampling	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO ₂ (µg/m ³)
Coal mine standards,GSR 742(E), dt.25.09.2000		250	-	120	120
1.	11.10.2022	162	61.5	16	19.5
2.	27.10.2022	170	64.4	16.7	19.9
3.	10.11.2022	173	66.1	17	20.3
4.	25.11.2022	170	70	17.6	20.9
5.	10.12.2022	180	73.8	18	21.2
6.	26.12.2022	183	72.6	17.7	20.6
Min		162.0	61.5	16.0	19.5
Max		183.0	73.8	18.0	21.2
Average		173.0	68.1	17.2	20.4
- No standard was specified for PM _{2.5} in core zone.					

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Ambient Air Quality at Goveriguá village (BA1)					
Sl. No.	Date of Sampling	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO ₂ (µg/m ³)
NAAQ Standards, CPCB, dt:18.11.2009		100	60	80	80
1.	13.09.2022	53.00	27.50	10.00	13.30
2.	28.09.2022	50.00	27.30	9.90	12.80
3.	14.10.2022	48	23.8	9.3	12.4
4.	31.10.2022	51	26.1	10.2	13.1
5.	14.11.2022	54	27.3	10.7	13.6
6.	29.11.2022	57	27.8	11.1	14
7.	14.12.2022	60	29.4	11.7	14.6
8.	29.12.2022	56	27.3	10.7	13.6
Min		48.0	23.8	9.3	12.4
Max		60.0	29.4	11.7	14.6
Average		53.6	27.1	10.5	13.4

Ambient Air Quality at Ullipitta Dorli village (BA2)					
Sl. No.	Date of Sampling	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO ₂ (µg/m ³)
NAAQ Standards, CPCB, dt:18.11.2009		100	60	80	80
1.	12.09.2022	48.00	26.80	10.70	13.70
2.	27.09.2022	46.00	22.00	10.00	13.10
3.	13.10.2022	45	22.4	9.7	12.2
4.	29.10.2022	49	25.9	9	12.8
5.	12.11.2022	52	26.8	9.9	13
6.	28.11.2022	55	27.3	10.3	13.5
7.	13.12.2022	59	28.8	10.9	14
8.	28.12.2022	54	27.5	10	13.9
Min		45.0	22.0	9.0	12.2
Max		59.0	28.8	10.9	14.0
Average		51.0	25.9	10.1	13.3

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Ambient Air Quality at Pathibanda village(BA3)					
Sl. No.	Date of Sampling	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO ₂ (µg/m ³)
NAAQ Standards CPCB, dt:18.11.2009		100	60	80	80
1.	12.09.2022	45.00	22.60	9.30	12.40
2.	27.09.2022	43.00	22.40	9.70	12.90
3.	13.10.2022	40	21.4	8.9	12
4.	29.10.2022	45	22.9	8.3	11.8
5.	12.11.2022	49	23.8	9	12.3
6.	28.11.2022	51	26.3	9.7	12.8
7.	13.12.2022	55	27	10	13.6
8.	28.12.2022	50	26.3	10.5	13
Min		40.0	21.4	8.3	11.8
Max		55.0	27.0	10.5	13.6
Average		47.3	24.1	9.4	12.6

Ambient Air Quality at Rehabilitated Dorli Village (BA4)					
Sl. No.	Date of Sampling	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO ₂ (µg/m ³)
NAAQ Standards CPCB, dt:18.11.2009		100	60	80	80
1.	12.10.2022	43	22.6	8.7	11.5
2.	28.10.2022	44	23.5	9.1	12.5
3.	10.11.2022	40	21.2	9.7	12.9
4.	25.11.2022	45	23.3	10.1	13.3
5.	10.12.2022	51	24	10.8	13.9
6.	26.12.2022	49	24.6	10.1	13.4
Min		40.0	21.2	8.7	11.5
Max		51.0	24.6	10.8	13.9
Average		45.3	23.2	9.8	12.9

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KHA OCP Noise levels monitoring data

Sampling interval: Once in fortnight

Sampling duration: 24 hours

Month	Fort night	KHA OC Project Office (CN1)			KHA OC Weigh bridge (CN2)		
		Sample collected on	L _{day}	L _{night}	Sample collected on	L _{day}	L _{night}
	Stnd.	75	70	75	70		
SEPT 2022	1 st	09.09.2022	61	50.5			
	2 nd	24.09.2022	60.8	50.1			
OCT-2022	1 st	11.10.2022	60.3	49.6	11.10.2022	62.1	51.1
	2 nd	27.10.2022	59.4	49	27.10.2022	62.8	52.1
NOV-2022	1 st	10.11.2022	59.8	49.8	10.11.2022	62.3	52.6
	2 nd	25.11.2022	59.3	48.8	25.11.2022	61.4	51.7
DEC-2022	1 st	10.12.2022	60	49.2	10.12.2022	61.1	51.2
	2 nd	26.12.2022	60.4	48.7	26.12.2022	62.1	52.6
Min.			59.3	48.7		61.1	51.1
Max.			61.0	50.5		62.8	52.6
Average			60.1	49.5		62.0	51.9

Month	Fort night	Ullipitta Dorli Village (BN1)			Pathibanda village (BN2)		
		Sample collected on	L _{day}	L _{night}	Sample collected on	L _{day}	L _{night}
	Stnd.	55	45	55	45		
SEPT 2022	1 st	12.09.2022	49.6	39.9	12.09.2022	48.9	38.7
	2 nd	27.09.2022	49.0	39.3	27.09.2022	48.3	38.2
OCT-2022	1 st	13.10.2022	49.4	38.8	13.10.2022	48.8	39.2
	2 nd	29.10.2022	48.9	38.3	29.10.2022	49.1	39.8
NOV-2022	1 st	12.11.2022	48.6	39.7	12.11.2022	49.6	38.8
	2 nd	28.11.2022	49.1	39.4	28.11.2022	48.8	38.2
DEC-2022	1 st	13.12.2022	49.8	38.9	13.12.2022	48.2	37.8
	2 nd	28.12.2022	50.4	40	28.12.2022	47.8	37.3
Min.			48.6	38.3		47.8	37.3
Max.			50.4	40.0		49.6	39.8
Average			49.4	39.3		48.7	38.5

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KHA OCP Characteristics of effluents
Sampling interval: Once in fortnight

Characteristics of effluents – KHA OCP. mine discharge (EW1)							
Sl.No.	Date of Sampling	pH (at 25°C)	TSS at 105 °C	TDS at 180°C	COD	BOD	Oil & Grease
Unit		--	mg/L	mg/L	mg/L	mg/L	mg/L
Test Method		4500-H ⁺ B	2540-D	2540-C	5220-D	IS3025	5520-B
MoEF GSR 742 (E) and GSR 801(E) Effluent Standards for coal mines		5.5 to 9.0	100	--	250	30	10
1.	15.09.2022	7.7	31	1043	16	3.6	<1
2.	30.09.2022	7.9	20	791	23	5.3	1.2
3.	15.10.2022	7.5	31	855	27	3.5	1.2
4.	31.10.2022	7.3	24	922	31	4	1
5.	15.11.2022	7.8	29	894	24	2.6	1
6.	30.11.2022	7.7	36	791	23	3.1	1.2
7.	15.12.2022	7.9	27	988	19	2	1.4
8.	31.12.2022	7.6	22	872	12	1.9	<1
MIN		7.3	20.0	791.0	12.0	1.9	<1.0
MAX		7.9	36.0	1043.0	31.0	5.3	1.4
Average		7.7	27.5	894.5	22.5	3.3	1.2

- No standard is specified for TDS.

Characteristics of effluents – KHA OCP BWS ETP OUTLET(EW3)							
xSl.No.	Date of Sampling	pH (at 25°C)	TSS at 105 °C	TDS at 180°C	COD	BOD	Oil & Grease
Unit		--	mg/L	mg/L	mg/L	mg/L	mg/L
Test Method		4500-H ⁺ B	2540-D	2540-C	5220-D	IS3025	5520-B
MoEF GSR 742 (E) and GSR 801(E) Effluent Standards for coal mines		5.5 to 9.0	100	--	250	30	10
1.	15.09.2022	7.4	66	1271	63	14.9	3
2.	30.09.2022	7.5	74	1507	75	16.2	3.4
3.	15.10.2022	7.6	66	1023	63	16.2	2.8
4.	31.10.2022	7.9	88	994	59	13.2	3
5.	15.11.2022	7.7	76	1171	68	19.3	3.2
6.	30.11.2022	7.4	77	1122	59	17.3	3.6
7.	15.12.2022	7.9	64	1336	67	13	3.2
8.	31.12.2022	8.1	86	1474	54	16.8	2.8
MIN		7.4	64.0	994.0	54.0	13.0	2.8
MAX		8.1	88.0	1507.0	75.0	19.3	3.6
Average		7.7	74.6	1237.3	63.5	15.9	3.1

- No standard is specified for TDS.

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Characteristics of effluents – KHA OCP CHP ETP OUTLET(EW4)							
xSl.No.	Date of Sampling	pH (at 25°C)	TSS at 105 °C	TDS at 180°C	COD	BOD	Oil & Grease
Unit		--	mg/L	mg/L	mg/L	mg/L	mg/L
Test Method		4500-H ⁺ B	2540-D	2540-C	5220-D	IS3025	5520-B
MoEF GSR 742 (E) and GSR 801(E) Effluent Standards for coal mines		5.5 to 9.0	100	--	250	30	10
1.	15.09.2022	6.9	45	1105	40	8.9	2.8
2.	30.09.2022	7.1	38	1249	47	12.2	2.6
3.	15.10.2022	8.1	35	881	31	3.6	<1
4.	31.10.2022	7.9	41	791	23	2.1	1
5.	15.11.2022	7.4	53	914	28	3.6	<1
6.	30.11.2022	8.2	62	840	27	3.1	1
7.	15.12.2022	7.8	74	1096	19	2	<1
8.	31.12.2022	7.5	59	1255	35	8.8	1
MIN		6.9	35.0	791.0	19.0	2.0	<1.0
MAX		8.2	74.0	1255.0	47.0	12.2	2.8
Average		7.6	50.9	1016.4	31.3	5.5	1.7
- No standard is specified for TDS.							

Physico-Chemical and Bacteriological Characteristics of Surface Water
 Sampling period once in 3 months Sample collected on 15.11.2022

Physico-Chemical and Bacteriological Characteristics of Surface Water as per CPCB Water Quality Criteria

Sl.No	Parameters	Unit	Test Method	CPCB Water Quality Criteria					RESULT	
				Class A	Class B	Class C	Class D	Class E	SW-1 Vatti Vagu U/S	SW-2 Vatti Vagu D/S
1	pH	-	4500-H ⁺ B	6.5-8.5	6.5-8.5	6.0-9.0	6.5-8.5	6.0-8.5	8.0	8.1
2	Electrical Conductivity	µmhos/cm	2510-B	-	-	-	-	2250 µmhos/cm	438	447
3	Dissolved Oxygen (DO)	mg/L	4500-O.C	6 mg/l or more	5 mg/l or more	4 mg/l or more	4 mg/l or more	-	6.1	6.3
4	Bio chemical Oxygen Demand (3 days 27° C)	mg/L	IS: 3025	2 mg/l or less	3 mg/l or less	3 mg/l or less	-	-	2.4	3.0
5	Total Coliforms	MPN/100mL	9221 B	50 or less	500 or less	5000 or less	-	-	130	170
6	Free Ammonia (as N)	mg/L	4500-NH ₃ -F	-	-	-	1.2 mg/L or less	-	BDL	BDL
7	Boron as B	mg/L	3120-B	-	-	-	-	Less than 2 mg/L	0.09	0.15
8	SAR	-	-	-	-	-	-	Less than 26	0.55	0.58

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S. No	Parameters	Unit	Test Method	SW-1 Vatti Vagu U/S	SW-2 Vatti Vagu D/S
1	Colour	Hazen	2120. B	5	10
2	Odour	TON	2150. B	No odour observed	No odour observed
3	Temperature	°C	2550. B	25.1	25.3
4	Turbidity	NTU	2130. B	1.3	2.6
5	Total Dissolved Solids at 180° C	mg/L	2540.C	260	258
6	Total Suspended Solids at 105° C	mg/L	2540. D	18	25
7	Chemical Oxygen Demand	mg/L	5220. D	20	24
8	Chlorides as Cl ⁻	mg/L	4500-Cl ⁻ .B	9.8	9.8
9	Sulphates as SO ₄ ²⁻	mg/L	4500-SO ₄ ²⁻ .E	35	46
10	Fluoride as F ⁻	mg/L	4500-F ⁻ .C	0.48	0.47
11	Calcium as Ca	mg/L	3500-Ca.B	36	34
12	Magnesium as Mg	mg/L	3500-Mg.B	22	20
13	Sodium as Na	mg/L	3500-Na.B	17	17.3
14	Potassium as K	mg/L	3500-K.B	1.9	1.8
15	Nitrites as NO ₂	mg/L	4500 NO ₂ .B	0.37	0.42
16	Nitrates as NO ₃	mg/L	4500-NO ₃ .B	8.1	7.3
17	Total Phosphates	mg/L	4500-P-D	BDL	BDL
18	Ammonical Nitrogen as NH ₃ -N	mg/L	4500-NH ₃ .C	BDL	BDL
19	Phenolic compounds as C ₆ H ₅ OH	mg/L	5530-D	BDL	BDL
20	Oil & Grease	mg/L	5520. B	<1	<1
21	Carbonates as CO ₃	mg/L	2320. B	nil	nil
22	Bi-carbonates as HCO ₃	mg/L	2320. B	196	185
23	Fecal Coliforms	MPN/100mL	9221 E	11	14
24	Zinc as Zn	mg/L	3120. B	0.15	0.23
25	Iron as Fe	mg/L	3120. B	0.73	0.38
26	Arsenic as As	mg/L	3120. B	BDL	BDL
27	Lead as Pb	mg/L	3120. B	BDL	BDL
28	Cadmium as Cd	mg/L	3120. B	BDL	BDL
29	Total Chromium as Cr	mg/L	3120. B	BDL	BDL
30	Nickel as Ni	mg/L	3120. B	BDL	BDL
31	Copper as Cu	mg/L	3120-B	BDL	BDL
32	Selenium as Se	mg/L	3120-B	BDL	BDL

Physico-Chemical and Bacteriological Characteristics of Ground Water
 Sampling period once in 3 months Sample collected on 15.11.2022

S.No.	Parameters	Unit	Test Method	IS: 10500 Requirement (Acceptable Limit)	IS: 10500 Permissible Limit in the absence of alternate source	RESULT	
						GW-1 Ullipitta Dorli Village	GW-2 Pathiband a Village
1	Colour	Hazen	2120. B	5	15	<5	<5
2	Odour	TON	2150. B	Agreeable	Agreeable	Agree.	Agree.
3	Ph	--	4500-H ⁺ B	6.5 to 8.5	No relaxation	7.3	7.4
4	Taste	FTN	2160. B	Agreeable	Agreeable	Agree.	Agree.
5	Turbidity	NTU	2130. B	1	5	0.53	0.46
6	Total Dissolved Solids at 180° C	mg/L	2540.C	500	2000	542	594
7	Calcium as Ca	mg/L	3500-Ca.B	75	200	98	102
8	Magnesium as Mg	mg/L	3500-Mg.B	30	100	52	54
9	Chlorides as Cl-	mg/L	4500-Cl-.B	250	1000	12	35
10	Sulphates as SO42-	mg/L	4500-SO42-.E	200	400	37	75
11	Fluoride as F-	mg/L	4500-F-.C	1.0	1.5	0.64	0.72
12	Nitrates as NO3	mg/L	4500-NO3-.B	45	No relaxation	83	86
13	Total Alkalinity as CaCO3	mg/L	2320. B	200	600	403	365
14	Total Hardness as CaCO3	mg/L	2340. C	200	600	460	478
15	Sulphide as H ₂ S	mg/L	4500-S2-F&D	0.05	No relaxation	BDL	BDL
16	Total Ammonia-N	mg/L	IS 3025 (Part 34)	0.5	No relaxation	BDL	BDL
17	Phenolic compounds as C6H5OH	mg/L	5530-D	0.001	0.002	BDL	BDL
18	Residual free chlorine	mg/L	4500-Cl-.B	0.2	1.0	BDL	BDL
19	Mineral oil	mg/L	IS:3025 (part 39)	0.5	No relaxation	absent	absent

20	Anionic Detergents (as MBAS)	mg/L	IS:13428:2005K	0.2	1.0	<0.2	<0.2
21	Aluminium as Al	mg/L	3120-B	0.03	0.2	0.08	0.17
22	Barium as Ba	mg/L	3120-B	0.7	No relaxation	0.04	4.8
23	Boron as B	mg/L	3120-B	0.5	2.4	BDL	0.04
24	Iron as Fe	mg/L	3120-B	1.0	No relaxation	0.46	0.59
25	Zinc as Zn	mg/L	3120-B	5	15	0.04	0.12
26	Copper as Cu	mg/L	3120-B	0.05	1.5	BDL	BDL
27	Manganese as Mn	mg/L	3120-B	0.1	0.3	BDL	BDL
28	Selenium as Se	mg/L	3120-B	0.01	No relaxation	BDL	BDL
29	Silver as Ag	mg/L	3120-B	0.1	No relaxation	BDL	BDL
30	Cadmium as Cd	mg/L	3120-B	0.003	No relaxation	BDL	BDL
31	Cyanide as CN-	mg/L	4500-CN.F	0.05	No relaxation	BDL	BDL
32	Lead as Pb	mg/L	3120-B	0.01	No relaxation	BDL	BDL
33	Molybdenum as Mo	mg/L	3120-B	0.07	No relaxation	BDL	BDL
34	Nickel as Ni	mg/L	3120-B	0.02	No relaxation	BDL	BDL
35	Total Arsenic as As	mg/L	3120-B	0.01	0.05	BDL	BDL
36	Total Chromium as Cr	mg/L	3120-B	0.05	No relaxation	BDL	BDL
37	Mercury as Hg	µg/L	3500-Hg.B	0.001	No relaxation	BDL	BDL
38	Pesticides: α-BHC, β-BHC, γ-BHC, δ-BHC, o, p-DDT, p' -DDT, Endosulfan, β- Endosulfan, Aldrin, Dieldrin	µg/L	6630-D	Absent	0.001	ND	ND
39	2,4-D, Carbaryl (Carbonate) Malathion Methyl Parathion Anilophos, Chloropyrifos	Qualitative analysis	6630-D	Absent	0.001	ND	ND
40	Polyaromatic Hydrocarbons (PAH's): Acenaphthene, Acenaphthylene,	µg/L	6440.C	-	-	ND	ND

41	Anthracene, B(a)A, B(a)P, B(b)F, B(k)F, Pyrene, Dibenz (a,h) anthracene, Fluoranthene, Fluorene, Indeno (1,2,3-c) Pyrene, Naphthalene, Phenanthrene, Pyrene, Methyl Naphthalene	MPN/100 MI	9221 B	-	-	-	<1.8	<1.8
42	Total Coliforms Fecal Coliforms	MPN/100 MI	9221 E	-	-	-	<1.8	<1.8


 General Manager
 Bellampalli Area

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