BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE BENCH, AT: CHENNAI

ORIGNAL APPLICATION NO.39 OF 2022

IN THE MATTER OF:

Gedam Dilip Kumar **....Applicant**

And

The Singareni Collieries Company Ltd **...Respondents**

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Place: Hyderabad
Date:12.04.2023.

Counsel for Respondent No.1&9

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE BENCH AT CHENNAI

ORIGNAL APPLICATION NO.39 OF 2022

IN THE MATTER OF:

Gedam Dilip Kumar
S/o. Gedam Dikaram, Aged 30 years
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Komurambheem Asifabad District
Telangana – 504 297
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H.No.1-15, Lekureguda
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... APPLICANTS

VS

The Singareni Collieries Company Ltd.,
Rep. by its Chairman and Managing Director
Kothagudem
Bhadradri Kothagudem District
Telangana – 507 101.
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Union of India
Through its Secretary
Ministry of Environment, Forest & CC
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Through its Secretary
Ministry of Coal
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Sanat Nagar, Hyderabad – 500 018
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Mail: NA

General Manager,
Singareni Collieries Company Ltd
Bellampalli Area, Kumram Bheem Asifabad District
Phone: 08735-231100
Mail: po_khg@scclmines.com

... RESPONDENTS

Office of the General Manager SCCL GOLETI Bellampalli Area.

OBJECTIONS ON BEHALF OF RESPONDENT NO.1 & 9 [THE SINGARENI COLLIERIES COMPANY LIMITED (SCCL)]

It is humbly submitted as follows:

1. The Hon'ble Tribunal vide order dated 11.01.2023 observed that there seem to be violations of the Environmental Clearance (EC) conditions, for which, the environmental compensation ought to have been calculated by the Pollution Control Board and hence, the Telangana State Pollution Control Board also has to answer why they have not computed the environmental compensation.

2. In compliance with the Tribunal order dated 11.01.2023, TSPCB has issued notice to the Singareni Collieries Company Limited (hereinafter referred to as Respondent Company) vide letter No.2807/PCB/RO/NZB/W&A/2022-44, dated 25.01.2023, wherein the TSPCB stated that 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. Further, it was also stated that reply to the said notice along with corrective measures taken to control the pollution after the visit of the joint committee should reach to their office within a week.

3. Accordingly, the Respondent Company has submitted its detailed reply vide letter No.BPA/ENV/59/2023/06, dated 30.01.2023, point-wise to the non-compliances alleged in the notice and the latest implementation status of pollution mitigation measures at Khairagura Opencast Expansion Project is also furnished therein.

4. It is submitted that Respondent Company has been taking various pollution mitigation measures in the project and is monitoring the pollution levels on regular basis by engaging a third party agency i.e.,

Environment Protection, Training and Research Institute, a CPCB recognized and NABL accredited laboratory and the monitored data reports are being furnished to MoEF&CC and TSPCB on periodical basis.

5. Further, the Respondent Company is taking following pollution control measures in Khairagura Open Cast Expansion Project.

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

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

(c) A mist sprayer is provided at crusher of pit head coal handling plant

(d) A sensor operated wetting point is provided to wet coal loaded dumpers.

(e) Fixed point water sprinkling arrangement is provided along permanent haul roads.

(f) Coal transporting trucks are being covered with tarpaulin and same is being ensured at SCCL's check posts by security personnel as per the EC. Condition No.4B (vii).

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

(h) 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

(i) The wet drilling is being adopted.

(j) As on 30.09.12 15,63,294 Nos. of plants were planted in an area of 427.23 Ha.

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6. The Hon'ble Tribunal vide order dated 08.02.2023 directed the TSPCB to revisit the site and make an inspection to state whether all the conditions are complied with or there are any shortcomings. Accordingly, TSPCB officials inspected the Project on 13.02.2023 and monitored the mitigation measures implemented by the Project authorities to control Air & Water pollution. Further, TSPCB issued notice to Singareni Collieries Company Limited (hereinafter referred to as Respondent Company/Project Proponent) vide letter No.2807/PCB/RO/NZB/W&A/2022-81, dated 14.02.2023, wherein the TSPCB stated as to why Environment Compensation should not be levied against the Project Proponent for violations of EC conditions under Air & Water Pollution Acts.

In response to the TSPCB letter dated 14.02.2023, the Project Proponent has submitted its reply to the TSPCB vide letter Ref. No. BPA/ENV/59/2023/11 dated 27.02.2023 by furnishing the details of mitigation measures taken for compliance of EC/CFO conditions.

7. It is further submitted that the responses of SCCL on the reports filed by TSPCB before the Hon'ble NGT on 06.02.2023 and 16.02.2023 are furnished hereunder.

A) *MoEF&CC has stipulated at specific condition no. 4 (A) (iii) of Environmental Clearance that* ***"The coal transportation on road by mechanically covered trucks"****.*

In order to comply with the condition, SCCL had put in all efforts for procurement of mechanically covered trucks for transportation of coal but could not deploy the same due to non-availability of trucks with desired mechanism. Further, SCCL deployed mechanically covered tarpaulin trucks in one of the 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.

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It is further submitted that MoEF&CC has also stipulated at condition General Condition No. 4B (vii) of Environmental Clearance that **"Vehicles used for transporting the mineral shall be covered with tarpaulins and optimally loaded"**. Hence, SCCL is adopting the system of covering the coal laden trucks with tarpaulin cloth so as to avoid spillage during coal transportation. Security check posts have been arranged along the coal transportation route to ensure that coal trucks are invariably covered with tarpaulin cloth.

It is submitted that by maintaining the present system of coal transport by tarpaulin covered trucks, the desired objective of controlling fugitive dust emissions is being fulfilled. SCCL has been taking all the mitigation measures for air pollution control during transportation of coal by road and the air quality parameters are also well within the stipulated norms. The ambient air quality is being regularly monitored through Environment Protection Training and Research Institute (EPTRI), Hyderabad, a third party & independent agency having a CPCB recognized and NABL accredited laboratory. The latest ambient air quality data monitored in nearby villages is enclosed as **Annexure-I**.

Further, Joint Committee constituted by Hon'ble NGT in this regard also opined that "any significant violations are not observed on account of operations". The joint committee also stated at page no. 51 of its report (Annexure-I i.e., compliance status of EC conditions) that "vehicles used for transporting of coal are being covered with tarpaulin and optimally loaded".

As SCCL is facing difficulty in deploying mechanically covered trucks, is adopting tarpaulin covered trucks for coal transportation as an alternative method as stipulated in the EC and the monitored air pollution levels are within the stipulated norms, the joint committee and regulatory

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authorities like MoEF&CC/TSPCB have endorsed the existing system of coal transport.

Security personnel checking covering of coal trucks with tarpaulin sheets

Keeping these aspects in view, TSPCB has been stipulating in the Consent for Operation (CFO) issued to Khairagura OC Expansion project that coal transport trucks shall be covered with tarpaulin cloth.

It is submitted that the Project Proponent has submitted an application to MoEF&CC on 13.02.2023 for amendment of EC condition No. 4(A) (iii) of EC order facilitating existing system of transportation of coal by tarpaulin covered trucks. It is further submitted that MoEF&CC has considered the proposal in its 41st meeting of the Expert Appraisal Committee (EAC) for coal mining projects held during 13-14 March, 2023. Expert Appraisal Committee recommended the proposal made by the Project Proponent due to fulfillment of the required objective of controlling of Pollution with the present system of covering of coal laden trucks with tarpaulin and the EC amendment is awaited from MoEF&CC.

B). *MoEF&CC has stipulated at specific condition no. 4 (A) (xli) of Environmental Clearance that* ***"Sewage treatment plant shall be installed in the existing colony".***

In this connection it is to submit that presently, the sewage from Goleti colony is being treated by conventional method i.e., septic tank

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followed by soak pit. The overflow water is being used for nursery plantation within the colony.

As a part of post-project environmental monitoring, the quality of Goleti Colony treated sewage effluent is being monitored regularly through EPTRI, Hyderabad, a CPCB recognized and NABL accredited Laboratory and the monitored parameters are well within the standards prescribed by CPCB. A copy of the latest monitoring report of Khairagura OCP including that of Goleti Colony treated sewage effluent is enclosed as **Annexure-II**.

It is submitted that 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 backed out without completing STP construction 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.

Considering the reasons for delay in constructing STP and on request of SCCL, TSPCB has been stipulating in the Consent for Operation issued to Khairagura OC Expansion project that treatment of domestic effluents shall be with septic tank followed by soak pit.

SCCL has taken up the construction of 2X100 KLD capacity STP in Goleti Township and 90% of the erection work has already been completed. The Project Proponent undertakes that STP will be commissioned by the end of April, 2023. The Photographs showing the progress of construction of STP at Goleti Colony are furnished hereunder.

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GOLETI
Bellampalli Area

Construction of STP for Goleti Colony

It is to submit that as per the Minutes of Meeting, EAC has recommended for Amendment of EC condition for transportation of coal by road mode with tarpaulin covered trucks instead of mechanically covered trucks. Also, colony sewage is being treated by conventional method of treatment without polluting surrounding environment and upgrading the present system of treatment with establishment of STP will also be completed by the end of April 2023. Hence, with the implementation of suitable mitigation measures in the project, it is ensured that the pollution levels are within the stipulation norms.

It is to pertinent to mention that there is no EC/CFO violation with respect to conditions related to coal transportation and treatment of colony sewerage.

It is also to submit that when the joint committee visited the project on 27th April, 2022, they noticed that drains were filled with some silt. However, soil erosion control measures like maintenance of toe walls, garland drains, settling ponds will be undertaken in the project before on setting of monsoon every year. Accordingly, the drains were strengthened and de-silted subsequently before monsoon. Director, MoEF&CC, IRO, Hyderabad also visited the project on 16th June, 2022 and inspected the corrective measures with regard to partial compliances of some of EC conditions as pointed out by the Joint committee. There was only one partial compliance observed by the IRO since the STP was not yet established for Goleti colony in place existing conventional method of treatment viz., Septic tank followed by soak pit.

Further, it is submitted that the Project Proponent has complied with all the EC/CFO conditions and not violated any of the EC/CFO condition as alleged by the Applicant. It is respectfully submitted that this

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Project Proponent undertakes that STP will complete by the end of April, 2023. The latest status of compliance of EC conditions was also submitted to TSPCB and a copy of the latest EC compliance report is being submitted for kind perusal as **Annexure-III.**

Keeping in view the steps taken by SCCL in implementation of EC conditions in Khairahura OC Expansion project, the Project Proponent is complied all the EC conditions and not violated any of the EC condition as alleged by the Applicant.

In view of the above mentioned facts, the Respondent Company/Project Proponent prays the Hon'ble Tribunal may be pleased to dismiss the OA filed by the Applicants as devoid of merits and may pass orders as may deem fit in the interest of justice.

Counsel for R1 and R9

Date: 12.04.2023

Office of the General Manager GOLETI

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

Ref. No. BPA/ENV/59/2023/11 Date: 27.02.2023

To
The 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 - Levy of Environmental Compensation in O. A. No. 39 of 2022 (SZ) - Reply to show cause notice - Reg.,

Ref: Lr. No. 2807/TSPCB/RO/NZB/W&A/2022 - 81, dt. 14.02.2023

***

With reference to the subject cited, RO, Nizamabad, TSPCB issued a show cause notice to the project authorities of Khairagura OCP Expansion regarding Levy of Environmental Compensation for non-compliance of some of the EC conditions in connection with a case filed in Hon'ble NGT, Chennai (SZ) vide OA No. 39 0f 2022.
It is to bring your kind notice that SCCL is implementing all the conditions stipulated in the Environmental Clearance of the Khairagura OC Expansion project issued by MoEF&CC vide Letter No.J-11015/28/2013-IA.II(M) dated 06.02.2015. SCCL has also taken up some additional measures for dump stabilization and soil erosion control in the project. The latest compliance status of Environmental Clearance conditions is enclosed as **Annexure - I** for kind perusal.

The clarifications with respect to non-compliances of Environmental Clearance conditions as mentioned by Hon'ble NGT, Chennai in its order dated 08.02.2023 are also furnished hereunder.

1) *MoEF&CC has stipulated at condition no. 4 (A) (iii) of Environmental Clearance Letter that "The coal transportation on road by mechanically covered trucks".*
MoEF&CC has also stipulated at condition no. 4B (vii) of Environmental Clearance Letter that "Vehicles used for transporting the mineral shall be covered with tarpaulins and optimally loaded".

In this connection, it is to submit that SCCL has deployed mechanically covered tarpaulin trucks in one of the 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.

Alternatively, SCCL is adopting the system of covering the coal laden trucks with tarpaulin cloth so as to avoid spillage during coal transportation. Security check posts have been arranged along the coal transportation route to ensure that coal trucks are invariably covered with tarpaulin cloth.

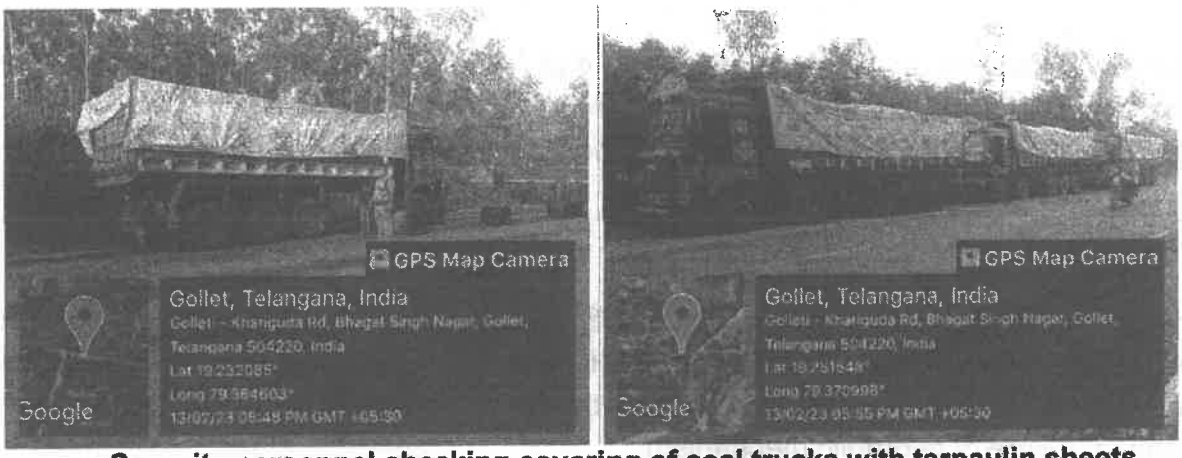
By maintaining the present system of coal transport by tarpaulin covered trucks, the desired objective of controlling fugitive dust emissions has been fulfilled. SCCL has been taking all the mitigation measures for air pollution control during transportation of coal by road mode and the air quality parameters are well within the stipulated norms. The ambient air quality is being regularly monitored through Environment Protection Training and Research Institute (EPTRI), a CPCB recognized and NABL accredited laboratory. The latest ambient air quality data monitored in nearby villages is enclosed as **Annexure-II**.

Further, the joint committee constituted by Hon'ble NGT stated at page no. 51 of its report (Annexure-I i.e., compliance status of EC conditions) that "vehicles used for transporting coal are being covered with tarpaulin and optimally loaded". The committee also concluded in its report that "any significant violations are not observed on account of operations".

As SCCL is facing difficulty in deploying mechanically covered trucks and alternatively adopting tarpaulin covered trucks for coal transportation as stipulated in the EC Letter, the joint committee and the regulatory authorities have endorsed the existing system of coal transport.

Keeping these aspects in view, TSPCB has been stipulating in the Consent for Operation (CFO) issued to Khairagura OC Expansion project that coal transport trucks shall be covered with tarpaulin cloth.

However, SCCL submitted an application to MoEF&CC on 13.02.2023 (proposal No. IA/TG/CMIN/297610/2023) for amendment of EC condition no. 4 (A) (iii) of EC letter to transport coal by tarpaulin covered trucks instead of mechanically covered trucks, as the main objective of controlling fugitive dust emissions during coal transportation has been complied with.



Security personnel checking covering of coal trucks with tarpaulin sheets

2) *MoEF&CC has stipulated at specific condition no. 4 (A) (xli) of Environmental Clearance that "Sewage treatment plant shall be installed in the existing colony".*
In this connection it is to submit that presently, the sewage from Goleti colony is being treated by conventional method i.e., septic tank followed by soak pit. The overflow water is being used for plantation within the colony.

Also, SCCL is monitoring the quality of treated domestic effluents and the monitored parameters are well within the standards prescribed by CPCB. A copy of the analysis report of the treated sewage effluent is enclosed as **Annexure-III**.

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 backed out without completing STP construction 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.

Considering the reasons for delay in constructing STP and on request of SCCL, TSPCB has been stipulating in the Consent for Operation issued to Khairagura OC Expansion project that treatment of domestic effluents shall be with septic tank followed by soak pit.

SCCL has taken up the construction of 2X100 KLD capacity STP in Goleti Township. Plant equipment has already been received and erection work is under progress which will be completed within two months period.

It is to submit that SCCL is complying with the conditions relating to coal transportation and treatment of colony sewage with the implementation of suitable mitigation measures thereby ensuring that the pollution levels are within the stipulation norms.
It is requested to consider the clarifications furnished above and condone any action in this regard.
Thanking you sir,

Yours faithfully

General Manager
Bellampalli Area

Annexure-I

ENVIRONMENT
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Table 1.0

Ambient Air Quality Monitoring Stations

S.No.	Station Code	Name of the Stations	Latitude	Longitude
CORE ZONE				
1	CA1	KHA OCP Project Office	N 19° 14' 07.8"	E 79° 17' 06.5"
2	CA2	KHA OCP Weigh Bridge	N 19° 14' 09"	E 79° 17' 02"
3	CA4	KHA OCP Weigh Bridge 2	N 19° 14' 01"	E 79° 17' 42"
BUFFER ZONE				
4	BA1	Goveriguda Village	N 19° 13' 55.6"	E 79° 16' 46.4"
5	BA2	Ullipitta Dorli Village	N 19° 16' 44.4"	E 79° 14' 29.8"
6	BA3	Pathibanda Village	N 19° 17' 49.4"	E 79° 15' 01.7"
7	BA10	Rehabilitated Dorli Village	N 19° 17' 21.3"	E 79° 14' 04.1"

**not carried out*

E.P.T.R.I. Lab

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Ambient Air Quality at KHA OCP Project Office (CA1)

(1)	Project Name	:	KhairaguraOpencast Expansion Project
(2)	Area	:	Bellampalli
(3)	Sampling Location & Code	:	KHA OCP Project Office (CA1)
(4)	Description of the location	:	Instrument was installed at a height of 3 meters on the top of the lamp house, surrounding to the station the following features were observed: The site is surrounded by Khairagura OCP mine activities at North, Followed by Forest area and Goverguda village at South. Quarry activities are carried out at East. Coal bunker and transportation road is observed at west. The site mainly lies in core zone.
(5)	Sampling Duration	:	24 hrs
(6)	Period of Monitoring	:	September, 2022 - December, 2022
(7)	Nature of the area	:	Core zone

Table 1.1

Ambient Air Quality at KHA OCP Project Office (CA1)

Sl. No.	Date of Sampling	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
Coal mine standards, GSR 742(E), Dated 25.09.2000		250	-	120	120
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	55.0	16.3	19.4
4.	27.10.2022	161	59.0	17.0	20.1
5.	10.11.2022	166	59.5	17.6	20.7
6.	25.11.2022	173	61.5	18.0	21.3
7.	10.12.2022	177	65.0	18.6	21.7
8.	26.12.2022	171	66.1	17.9	20.5

- No standard was specified for PM2.5 in core zone

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Ambient Air Quality at KHA OCP Weigh Bridge (CA2)

(1) Project Name : KhairaguraOpencast Expansion Project

(2) Area : Bellampalli

(3) Sampling Location & Code : KHA OCP Weigh Bridge (CA2)

(4) Description of the location : Instrument was installed at a height of 3 meters on the top of the lamp house, surrounding to the station the following features were observed:

The site is surrounded by Khairagura OCP mine activities in North, Coal bunker and transportation road is in West, Quarry activities in East, Forest area and Goverguda Village is observed in South. The site mainly lies in Core zone.

(5) Sampling Duration : 24 hrs

(6) Period of Monitoring : September, 2022 - December, 2022

(7) Nature of the area : Core zone

Table 1.2

Ambient Air Quality at KHA OCP Weigh Bridge (CA2)

Sl. No.	Date of Sampling	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
Coal mine standards, GSR 742(E), Dated 25.09.2000		250	-	120	120
1.	09.09.2022	180	74.4	18.3	21.2
2.	24.09.2022	175	65.5	17.9	20.6
3.	11.10.2022	171	64.4	17.6	20.8
4.	27.10.2022	181	69.0	18.1	21.2
5.	10.11.2022	75	70	62.3	52.6
6.	25.11.2022	75	70	61.4	51.7
7.	10.12.2022	194	76.3	19.1	22.3
8.	26.12.2022	190	79.3	18.8	21.7

- *No standard was specified for PM2.5in core zone*

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Ambient Air Quality at KHA OCP Weigh Bridge 2 (CA4)

(1)	Project Name	:	KhairaguraOpencast Expansion Project
(2)	Area	:	Bellampalli
(3)	Sampling Location & Code	:	KHA OCP Weigh Bridge 2 (CA4)
(4)	Description of the location	:	Instrument was installed at a height of 4 meters on the top of the Weigh bridge, surrounding to the station the following features were observed: The site is surrounded by Khairagura OCP OB dump activities in North, KHA OCP is in West, Quarry activities in East, Coal transportation road is observed in South & East. The site mainly lies in Core zone.
(5)	Sampling Duration	:	24 hrs
(6)	Period of Monitoring	:	September, 2022 - December, 2022
(7)	Nature of the area	:	Buffer zone

Table 1.3
Ambient Air Quality at KHA OCP Weigh Bridge 2 (CA4)

Sl. No.	Date of Sampling	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
NAAQ Standards, CPCB Dated : 18.11.2009		100	60	80	80
1.	09.09.2022	171	67.8	17.0	20.8
2.	24.09.2022	169	64.4	16.5	20.0
3.	11.10.2022	162	61.5	16.0	19.5
4.	27.10.2022	170	64.4	16.7	19.9
5.	10.11.2022	173	66.1	17.0	20.3
6.	25.11.2022	170	70.0	17.6	20.9
7.	10.12.2022	180	73.8	18.0	21.2
8.	26.12.2022	183	72.6	17.7	20.6

EPTRI Lab Hyderabad-500032

ENVIRONMENT
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Ambient Air Quality at Goveriguda Village (BA1)

(1) Project Name : KhairaguraOpencast Expansion Project

(2) Area : Bellampalli

(3) Sampling Location & Code : Goveriguda Village (BA1)

(4) Description of the location : Instrument was installed at a height of 3 meters on the top of Sri AtharamSomu's house, surrounding to the station the following features was observed:

The site is surrounded by Khairagura OCP mine and coal transportation road a North, followed by Forest area at South, East & West direction Quarry activities are observed at East. The site area mainly lies in buffer zone

(5) Sampling Duration : 24 hrs

(6) Period of Monitoring : September, 2022 - December, 2022

(7) Nature of the area : Buffer zone

Table 1.4
Ambient Air Quality at Goveriguda Village (BA1)

Sl. No.	Date of Sampling	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
NAAQ Standards, CPCB Dated : 18.11.2009		100	60	80	80
1.	13.09.2022	53	27.5	10.0	13.3
2.	28.09.2022	50	27.3	9.9	12.8
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	14.0
7.	14.12.2022	60	29.4	11.7	14.6
8.	29.12.2022	56	27.3	10.7	13.6

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Ambient Air Quality at Ullipitta Dorli Village (BA2)

1)	Project Name	:	KhairaguraOpencast Expansion Project
2)	Area	:	Bellampalli
3)	Sampling Location & Code	:	Ullipitta Dorli Village (BA2)
4)	Description of the location	:	Instrument wasinstalled at a height of 4.5 meters on the top of Sri Ramu's house, surrounding to the station the following features were observed: The site is surrounded by Dorli village in North direction, followed by thiryani road and forest area in south. Dumping yard is observed in East, Vattivagu project is observed in West. The site is mainly lies at buffer zone
5)	Sampling Duration	:	24 hrs
6)	Period of Monitoring	:	September, 2022 - December, 2022
7)	Nature of the area	:	Buffer zone

Table 1.5

Ambient Air Quality at Ullipitta Dorli Village (BA2)

Sl. No.	Date of Sampling	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
NAAQ Standards, CPCB Dated : 18.11.2009		100	60	80	80
1.	12.09.2022	48	26.8	10.7	13.7
2.	27.09.2022	46	22.0	10.0	13.1
3.	13.10.2022	45	22.4	9.7	12.2
4.	29.10.2022	49	25.9	9.0	12.8
5.	12.11.2022	52	26.8	9.9	13.0
6.	28.11.2022	55	27.3	10.3	13.5
7.	13.12.2022	59	28.8	10.9	14.0
8.	28.12.2022	54	27.5	10.0	13.9

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Ambient Air Quality at Pathibanda Village (BA3)

(1)	Project Name	:	KhairaguraOpencast Expansion Project
(2)	Area	:	Bellampalli
(3)	Sampling Location & Code	:	Pathibanda Village (BA3)
(4)	Description of the location	:	Instrument wasinstalled at a height of 3.5 meters on the top of Ms. Parvathi Bhai's house, surrounding to the station the following features were observed: The site is surrounded by Road connecting to Asifabad in North, Agricultural area and hills are observed in south, East & West. The site mainly lies in buffer zone.
(5)	Sampling Duration	:	24 hrs
(6)	Period of Monitoring	:	September, 2022 - December, 2022
(7)	Nature of the area	:	Buffer zone

Table 1.6

Ambient Air Quality at Pathibanda Village (BA3)

Sl. No.	Date of Sampling	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
NAAQ Standards, CPCB Dated : 18.11.2009		100	60	80	80
1.	12.09.2022	45	22.6	9.3	12.4
2.	27.09.2022	43	22.4	9.7	12.9
3.	13.10.2022	40	21.4	8.9	12.0
4.	29.10.2022	45	22.9	8.3	11.8
5.	12.11.2022	49	23.8	9.0	12.3
6.	28.11.2022	51	26.3	9.7	12.8
7.	13.12.2022	55	27.0	10.0	13.6
8.	28.12.2022	50	26.3	10.5	13.0

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Ambient Air Quality at Rehabilitated Dorli Village (BA10)

(1)	Project Name	:	KhairaguraOpencast Expansion Project
(2)	Area	:	Bellampalli
(3)	Sampling Location & Code	:	Rehabilitated Dorli Village (BA10)
(4)	Description of the location	:	Instrument was installed at a height of 2.5 meters on the top of Smt. B. Ambubai's house, surrounding to the station the following features were observed: The site is surrounded by Agriculture lands near Pathibanda Village in North, followed by forest area in South & West. Dorli OCP-I mine is observed in East. The site is mainly lies in buffer zone
(5)	Sampling Duration	:	24 hrs
(6)	Period of Monitoring	:	September, 2022 - December, 2022
(7)	Nature of the area	:	Buffer zone

Table 1.7
Ambient Air Quality at Rehabilitated Dorli Village (BA10)

Sl. No.	Date of Sampling	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
NAAQ Standards, CPCB Dated : 18.11.2009		100	60	80	80
1.	09.09.2022	46	23.5	9.2	12.6
2.	24.09.2022	42	23.1	9.8	12.1
3.	12.10.2022	43	22.6	8.7	11.5
4.	28.10.2022	44	23.5	9.1	12.5
5.	10.11.2022	40	21.2	9.7	12.9
6.	25.11.2022	45	23.3	10.1	13.3
7.	10.12.2022	51	24.0	10.8	13.9
8.	26.12.2022	49	24.6	10.1	13.4

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1	Project Name	:	Others
2	Area	:	Bellampalli
3	Sampling Location & Code	:	Goleti Township Treated Sewage Effluent (EW12)
4	Nature of the Component	:	Effluents
5	Period of Monitoring	:	September 2022 – December 2022

Table 3.6
Characteristics of Effluents – Goleti Township Treated Sewage Effluent (EW12)

S.No.	Date of Sampling	pH	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	IS 3025	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	7.2	59	1390	51	11.1	1.4
2.	30.09.2022	6.9	71	1496	52	13.1	1
3.	15.10.2022	7.2	50	1255	43	9.2	1
4.	31.10.2022	7.8	61	1147	47	13.2	<1
5.	15.11.2022	7.6	83	1082	52	10.3	1.2
6.	30.11.2022	7.5	42	952	39	9.3	<1
7.	15.12.2022	6.9	63	1178	43	11	1.4
8.	31.12.2022	7.3	78	1323	67	23.6	2.0

<table>
<tr><th>S.No.</th><th>CONDITIONS</th><th>COMPLIANCE</th></tr>
<tr><td colspan="3">4A. Specific condition:</td></tr>
<tr><td>(i)</td><td>The maximum production from the mine at any given time shall not exceed the limit as prescribed in the EC.</td><td>The year-wise coal production is within the sanctioned EC capacity as shown below.
<table>
<tr><th rowspan="2">S. No</th><th rowspan="2">Year</th><th></th><th>Coal (in MT)</th></tr>
<tr><th>As per EC</th><th>Actual</th></tr>
<tr><td>1.</td><td>2015-16</td><td rowspan="7">3.75 (As per existing EC)</td><td>3.37</td></tr>
<tr><td>2.</td><td>2016-17</td><td>3.12</td></tr>
<tr><td>3.</td><td>2017-18</td><td>3.41</td></tr>
<tr><td>4.</td><td>2018-19</td><td>2.91</td></tr>
<tr><td>5.</td><td>2019-20</td><td>2.60</td></tr>
<tr><td>6.</td><td>2020-21</td><td>1.25</td></tr>
<tr><td>7.</td><td>2021-22</td><td>2.35</td></tr>
</table></td></tr>
<tr><td>(ii)</td><td>The validity of the EC is for the life of the Mine or as specified in the EIA Notification, 2006, whichever is earlier.</td><td>Balance life of the mine is 8 years (from 2022-23).</td></tr>
<tr><td>(iii)</td><td>The voids shall be filled up to the near ground level by the OB from the new Ullipitta Dorli mine.

The coal transportation on road by mechanically covered trucks.</td><td>The void will be filled as per the final mine closure plan approved by MoC, GoI.

In order to comply with the condition, SCCL has been making continuous efforts for procurement of mechanically covered trucks for transportation of coal by road mode but is facing difficulty in deploying the same due to non-availability of trucks with desired mechanism.

SCCL deployed mechanically covered tarpaulin trucks in one of the 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.

MoEF&CC has also stipulated at condition General Condition 4B No vii of EC Lr. that</td></tr>
</table>

		"Vehicles used for transporting the mineral shall be covered with tarpaulins and optimally loaded". Hence, SCCL is adopting the system of covering the coal laden trucks with tarpaulin cloth so as to avoid spillage during coal transportation. Security check system has been arranged at the project to ensure that coal trucks are invariably covered with tarpaulin cloth.  Security personnel checking covering of coal trucks with tarpaulin sheets By maintaining the present system of coal transport by tarpaulin covered trucks, the desired objective of controlling fugitive dust emissions is being fulfilled. SCCL has been taking all the mitigation measures for air pollution control during transportation of coal by road and the air quality parameters are also well within the stipulated norms. However, SCCL submitted an application to MoEF&CC on 13.02.2023 for amendment of EC condition no. 4 (A) (iii) of EC letter to permit transportation of coal by tarpaulin covered trucks instead of mechanically covered trucks, as the main objective of controlling fugitive dust emissions during coal transportation is being complied with. MoEF&CC has considered the proposal in its 41st meeting of the Expert Appraisal Committee (EAC) for coal mining projects held during 13-14 March, 2023. EAC recommended the proposal made by the SCCL due to fulfillment of the required

		objective of controlling of Pollution with the present system of covering of coal laden trucks with tarpaulin and the EC amendment is awaited from MoEF&CC
(iv)	The coal loading at siding shall be by conveyer belt.	The coal is being loaded by conveyors into closed pre-weigh bin at the siding and then into wagons for dispatch of coal to customers by rail mode.
(v)	The social audit report of the CSR be submitted to the MoEF for record and be uploaded on to the Company's website.	The Social Audit / Socio Economic Survey for monitoring the implementation of R&R and CSR activities in the project was carried out through Centre for Good Governance in February 2021. The study report was submitted to MoEF&CC on 26.08.2021 and uploaded to SCCL website along with EC compliance report at www.scclmines.com/env.
(vi)	Instead of provision of bag filters, effective sensor operated water sprinkling system be provided for dust suppression at crusher house and transfer points at pit head coal handling arrangement.	Sensor operated water sprinkling system has been provided for dust suppression at crusher house and transfer points at pit head coal handling arrangement.  A dust fighter (mist sprayer) is also provided at pit head CHP for dust suppression. 

		A sensor activated wetting point is provided to wet loaded dumpers before unloading the coal into crushers.  Permanent water sprinkling arrangement is provided around pre-weigh bin at pit-head CHP.  Mist spraying arrangement is provided at the crusher site. 
(vii)	The proponent shall utilize the final void for dumping of overburden generated from the proposed “Ullipitta Block” (Relay Project) which is adjacent to the	The void will be filled as per the final mine closure plan approved by MoC, GoI

(viii)	The final mine closure plan will be submitted to MOEF 5 years in advance of final mine closure for approval.	The final mine closure plan will be submitted to MoEF&CC in the year 2025-26, i.e, five years before the closure of mine with due approval from MoC.
(ix)	Coal transportation in-pit Crusher to surface CHP through belt conveyor (1.5 Km length). Surface to siding by trucks (14Km) and siding to loading by wagon.	Coal is being transported from face to in-pit crusher by dumpers within the project and to Goleti CHP by tarpaulin covered trucks. The coal is being loaded by conveyors into closed pre-weigh bin and then into wagons.
(x)	The production shall be within the same Mining Lease area.	The coal production is confined to mine lease area only.
(xi)	The depth of the internal void shall be 40m from the ground level and should be adequate for fishery purpose.	The void will be filled as per the final mine closure plan approved by MoC, GoI.
(xii)	All safety measures shall be taken as per CMR, 1957 and related circulars.	All safety measures are being taken as per CMR, 2017 and related circulars. All statutory permissions were obtained from DGMS for safe operation of the mine.
(xiii)	The production shall be within the same Mining Lease area.	The coal production is confined to mine lease area only.
(xiv)	The OB shall be completely re-handled at the end of the mining and will be back filled up to the ground level and covered with about a meter thick topsoil and put to use. The land after mining shall be brought back for agriculture purpose.	The OB will be re-handled at the end of mining operations as per the final mine closure plan approved by MoC, GoI. About 129.928 MBCM of OB was backfilled in 215.736 Ha up to 31.03.2023.
(xv)	Garland drains to be provided.	Garland drains and deck drains were provided around three external overburden dumps and one internal dump for arresting silt. The garland drains, deck drains etc., are being regularly de-silted and maintained properly. Garland drains and deck drains are made for a total length of 18.01 km and 28.6 km for OB dumps respectively. At D I Dump: • Garland drain for a length of 6.6 Km • Deck drains for 5.1 Km length on first deck terrace • Deck drains for 4.44 Km length on second deck terrace At D II Dump:

		• Garland drains for a length of 3.8 km • Deck drains for 3.42 km length on first deck terrace • Deck drains for 2.21 km length on second deck terrace. At D III dump: • Garland drains for a length of 6.61 km • Deck drains for 6.64 km length on first deck terrace • Deck drains for 4.10 km length on second deck terrace At Internal dump: • Garland drains for a length of 1 Km • deck drains for 840 m length on first deck terrace • deck drains for 850 m length on 2nd deck terrace • deck drains for 1 km length on 3rd deck terrace Around Quarry: ➢ 8 km Garland drain is provided around the quarry. ➢ Eight settling ponds of size 30m*30m*2m are made followed by six check dams for dumps to arrest silt and sediment flows from dumps. ➢ Recently, three additional siltation ponds (100 m X 50 m X 2m) each with a capacity of 22 lakh gallons were also made near D3 dump for further strengthening of soil erosion control measures. ➢ SCCL has also taken steps to deploy one shovel on hire basis exclusively for soil control measures.
		

	Garland drain at D3 Dump	
	 **Deck Drains at Dump 3**	
xvi)	Appropriate embankment shall be provided along the side of the river/nallah flowing near or adjacent to the mine.  **Toe wall all along embankment**  Plantation along embankment	An earthen bund of 3.2 km length was constructed along Vatti Vagu reservoir. The dimensions of earthen bund are as follows: • Top width- 10 m • Bottom width- 16 m • Height- 3 m above the HFL The HFL of Vatti Vagu is 938.40 m. (08.09.2010) above MSL and that of embankment is 942.00 m. A CC toe wall is also constructed along the earthen bund and strengthened by stone pitching on the river front side. The earthen embankment has also been stabilized with extensive plantation. 

		 Stone pitching along earthenbund
xvii)	The CSR cost should be Rs.5 per tonne of coal produced which should be adjusted as per the annual inflation.	The CSR plan is being implemented as per the CSR policy approved by SCCL's Board of Directors. Required works/activities are being taken up by The S. C. Co. Ltd., every year under CSR policy such as laying of roads, construction of drains, toilets, providing drinking water facilities, bore wells, power lines, self-development trainings, mobile medical van with qualified doctors & crew, medical camps etc., So far, an amount of Rs. 22.25 Crores was spent on CSR activities in the surrounding villages of the project. The CSR expenditure is more than Rs. 5.0 / tonne of coal. In addition to the above, an amount of Rs. 184.84 Crores was deposited with Komuram Bheem District Authorities towards District Mineral Foundation Trust (DMFT) for taking up developmental activities in the project affected villages.

	 CC Drain in Tiryani  Bus Shelter at Ulipitta Village	 Motor vehicle driving training to un-employed youth  CC Road in madaram village
(xviii)	Everybody in the core area should be provided with mask for protection against fugitive dust emissions.	Dust masks are being provided to employees working in the core area for protection against fugitive dust emissions. 
(xix)	Dust mask to be provided to everyone working in the mining area.	Dust masks are provided to every employee exposed to dusty environment. 

(xx)	The supervisory staff should be held personally responsible for ensuring compulsory regarding wearing of dust mask in the core area.	The supervisory staff is ensuring wearing of dust mask by employees working in the core area.
(xxi)	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.	SCCL is providing free medical treatment to all the workmen and their family members in the 7 Area hospitals (with a total of 821 beds) and 21 dispensaries established in all the workings areas of the company. The annual expenditure incurred by SCCL in maintenance of health care facilities during 2021-22 is Rs.267.00 Crores. SCCL is also conducting regular health camps in villages located in the vicinity of project to study the health status of the people and is providing free treatment in SCCL hospitals. In addition, SCCL established twelve Initial Medical Examination (IME) /Periodical Medical Examination (PME) centers in the company, i.e., at Kothagudem, Manuguru, Yellandu, Godavarikhani, Sector - III Colony (Godavarikhani), Bellampalli, Goleti, Ramakrishnapur, Mandamarri, Srirampur Bhupalpally and Sathupalli for conducting IME/PME of the employees including contract workmen. All the PME Centers are equipped with necessary infrastructure for carrying out IME/PME and maintenance of data base. Every PME center is provided with the facility for chest radiographs as per ILO guidelines with a set of ILO standard chest radiographs on Pneumoconiosis, lung function tests with computerized Spirometres of RMS make and facilities for Audiometry with pure tone Audiometry equipment. All the Chest radiographs of the initial and periodical medical examinations are being classified for detection, diagnosis and documentation of Pneumoconiosis in accordance with the ILO classification for Pneumoconiosis according to DGMS guidelines. All the PME Doctors employed except gynaecologists, paediatricians, surgeons and ortho surgeons are trained to read PME X-Rays in accordance with ILO

		classification of Pneumoconiosis. Out of a total of 209 Doctors on roll as on date, 123 Doctors are trained in reading the chest radiographs as per the ILO guidelines. Occupational health surveillance programme of the workers is being carried out to check the health profile of the workmen i.e. for the lung diseases, hearing impairment, eye testing, heart functioning, hypertension, diabetes, chest X-Ray, complete blood and urine picture, etc., SCCL has one Occupational Diseases Board (Pneumoconiosis Board) in existence since 1965. Chief of Medical Services, Radiologist constituted the Occupational Diseases Board, Physician and Occupational Health Physician together. In SCCL, every employee above 45 years age is examined at an interval of once in five years and employees of below 45 years age are examined once in three years under PME. If, on examination his health status is found to be normal, he will be reviewed after completion of 5/3 years period. Eye refraction test is being done for vehicle drivers and HEMM operators at an interval of once in a year. The PME details are being submitted to the Ministry and to the DGMS at regular intervals.
(xxii)	The mining area should be surrounded by green belt having closed thick canopy of the tree cover.	Plantation is being taken up as per approved EMP. So far, 15, 63,294 nos. of plants were planted in an area of 427.23 Ha. up to 31.03.2023. The plantation details are shown below: • Dump area- 372.45 Ha. (including 29 Ha internal dump) • Avenue & greenbelt area: 54.28 Ha
		

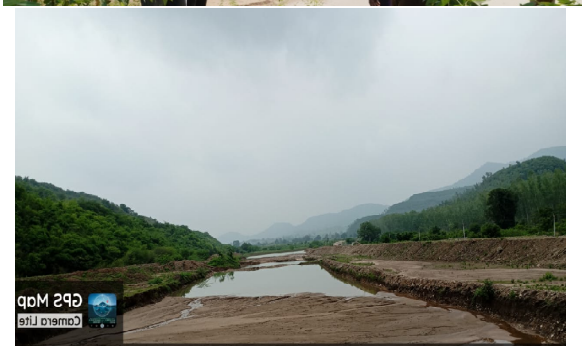
		
xxiii)	The embankment constructed along the river boundary shall be of suitable dimensions and critical patches shall be strengthened by stone pitching on the river front side and stabilized with plantation so as to with stand the peak water flow and prevent mine inundation.   Stone pitching along earthen bund	An earthen bund of 3.2 km length is made all along Vattivagu Reservoir and strengthened by stone pitching on the river front side to withstand peak water flow and to prevent mine inundation. The dimensions of earthen bund are as follows: • Top width- 10 m • Bottom width- 16 m • Height- 3 m above the HFL The HFL of Vattivagu is 938.40 m. (08.09.2010) above MSL and the embankment is 942.00 m. A CC toe wall is also constructed along the earthen bund. Embankment was also stabilized with plantation for withstanding the peak water flow and prevent mine inundation.  Plantation on Protection bund of Vattivagu
(xxiv)	There shall be no overflow of OB into the river and into the agricultural fields and massive	Plantation was taken up in the area between the Vattivagu and the project by planting native species

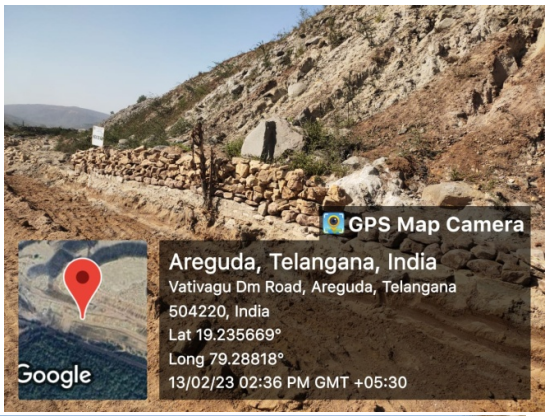
	be taken up in the area between the river and the project.	All necessary measures such as preparation of drains around dumps, making of earthen bund around dumps, stabilization of final dumps with plantation, etc. are being taken up to prevent overflow of OB into the Vattivagu reservoir and into the agricultural fields. The garland drains, deck drains, check dams etc., being regularly de-silted and maintained properly. An earthen bund of 3.2 km length was constructed along Vattivagu reservoir. The dimensions of earthen bund are as follows: • Top width-10m • Bottom width-16m • Height-3m above the HFL The HFL of Vatti Vagu is 938.40 m. (08.09.2010) above MSL and the embankment is 942.00 m. A CC toe wall is also constructed along the earthen bund. Further, in order to improve drainage system in Ullipitta Village, SCCL has strengthened 200 m length of nallah with suitable dimensions, 2 nos. of box culverts and 1 no. of hume pipe culvert are also constructed. 

		 Agriculture fields near stabilised D-3 Dump adjacent to Ullipitta village.  **Plantation between vattivagu & KHOCP project**   **Box culvert constructed by SCCL in Ullipitta village**

		 **Hume pipe 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**
(xxv)	OB shall be stacked at four earmarked external OB dumpsite(s) only. The ultimate slope of the dump shall not exceed 28°. Monitoring and management of existing reclaimed dumpsites shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of	OB was dumped at three earmarked external dump sites and being dumped in one internal dump as envisaged in the approved EMP. The ultimate slope of the dump is less than 28 degrees. The plantation was carried out as per EMP. Monitoring and management of existing reclaimed dump sites is being carried out. Compliance status is being submitted to the Ministry of Environment, Forests &

	Environment, Forests & Climate Change and its concerned Regional office on yearly basis.	Climate Change and its concerned Regional office on half yearly basis.
(xxvi)	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 de-silted and maintained properly. Garland drains (size, gradient and 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.	Soil erosion control measures being adopted in the project are as follows: Garland drains and deck drains are made around 3 external overburden dumps and one internal dump for arresting silt. The garland drains, deck drains etc., are being regularly de-silted and maintained properly. Garland drains and deck drains are made for a total length of 18.01 km and 28.6 km for OB dumps respectively. At D I Dump: • Garland drain for a length of 6.6 Km • Deck drains for 5.1 Km length on first deck terrace • Deck drains for 4.44 Km length on second deck terrace At D II Dump: • Garland drains for a length of 3.8km • Deck drains for 3.42 km length on first deck terrace • Deck drains for 2.21 km length on second deck terrace. At D III dump: • Garland drains for a length of 6.61 km • Deck drains for 6.64 km length on first deck terrace • Deck drains for 4.10 km length on second deck terrace At Internal dump: • Garland drains for a length of 1 Km • deck drains for 840m length on first deck terrace • deck drains for 850m length on 2nd deck terrace • deck drains for 1 km length on 3rd deck terrace Around Quarry: • 8 km Garland drain is provided around the quarry. • Eight (8) no's of settling ponds of size 30mX30mX2m are made followed by six check dams to arrest silt and sediment flows from dumps.

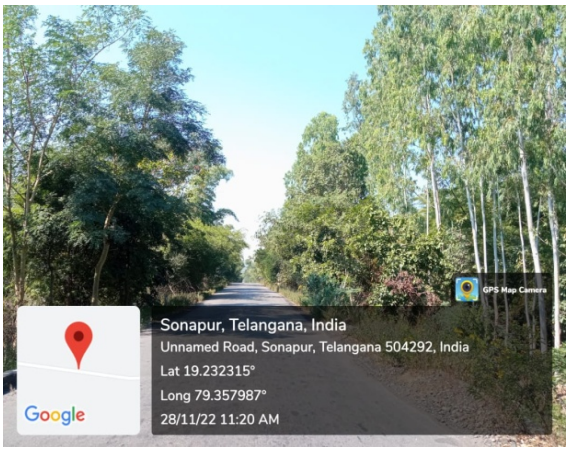
		• Recently, three (3) additional siltation ponds (100 m X 50 m X 2m) each with a capacity of 22 lakh gallons were also made near D3 dump for further strengthening of soil erosion control measures • The collected water is being utilized for spraying the mine area, roads & green belt development, etc. • SCCL has also taken steps to deploy one shovel on hire basis exclusively for soil control measures.
	 Settling ponds for arresting silt	  Settling ponds for arresting silt  **3 Settling ponds near Stabilised D3 Dump**

		 Check dam  Check dam beside D-2 Dump
(xxvii)	Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation shall be based on the rainfall data.	A stone retaining wall is provided along earthen bund along toe of the dumps based on the rainfall data to check run-off and siltation.  
(xxviii)	Crushers at the CHP of adequate capacity for the expansion project shall be	Coal is not pulverized in the crushers and is only crushed to (-) 200 mm size.

	operated with high efficiency bag filters, water sprinkling system shall be provided to check fugitive emissions from crushing operations, conveyor system, haulage roads, transfer points, etc.	Hence, instead of bag filters, fixed as well as mobile mist spray arrangements have been provided for controlling dust emissions and the air quality parameters monitored at the CHP are well within the stipulated norms. MoEF&CC has also stipulated at condition no. (vi) that *"instead of effective sensor operated water sprinkling system be provided for dust suppression at crusher house and transfer points at pit head coal handling arrangement".* Hence, SCCL is taking the following precautions for controlling fugitive dust emissions: Fixed water sprinkling system was provided at crushing operations, haul roads, coal transfer points, etc., for effective dust suppression.  Further, permanent water sprinkling arrangement is provided around pre-weigh bin and it is working well.  A sensor activated wetting point is provided for wetting coal loaded dumpers before unloading coal into crushers.

		 7 nos. of 28 KL & 5 no of 10 KL capacity mobile water sprinklers are being deployed for dust suppression on haul roads, approach roads, dumps, etc. 
(xxix)	Drills shall be wet operated. Roads shall be metal topped and mechanical sweepers shall be regularly deployed to clear the dust off the main approach and mineral transportation roads. Water sprinkling (fixed and mist type, mobile) shall be regularly done along the main haul roads.	➢ Wet drilling is being adopted.  ➢ Mechanical sweeper is deployed to clear the dust from coal transport road. ➢ A sensor activated wetting point is provided for wetting coal loaded dumpers before unloading coal into crushers. 

		➢ Fixed point water sprinkling system is provided along permanent roads.  ➢ A mist sprayer is also provided at pit head CHP for dust suppression.  ➢ 7 nos. of 28 KL & 5 no of 10KL capacity mobile water sprinklers are being deployed for dust suppression on haul roads, approach roads, dumps, etc., 
(xxx)	The project authorities shall undertake regular repairing and tarring of roads used for mineral transportation. A 3-tier green belt comprising of a mix of native species shall be developed all along the major	Maintenance of coal transport road is being done at regular intervals. A 3-tier green belt comprising of a mix of native species is developed all along the major approach roads.

	approach roads.	 Plantation is carried out with the following native species *Hardwikia binata, Dendrocalamus strictus, Ficus religiosa, Azadirachta indica, Limonia acidissima, Ficus bengalensis, Aegle marmelos, Mitragyna parvifolia, Dalbergia latifolia, Pterocarpus marsupium, Syzygium cumini, Albizzia procera, Terminalia bellarica, Pongamia pinnata, Madhuka indica, Pithecelobium dulci, Sterculia urens, Dalbergia sissoo, Bombax ceiba, Albizzia lebbek etc.*
(xxxi)	Controlled blasting shall be practiced with use of delay detonators and only during daytime. The mitigative measures for control of ground vibrations and to arrest the fly rocks and boulders shall be implemented.	Controlled blasting with non-electric delay detonators is being adopted. The blasting is being carried out only during day time. Mitigative measures like optimum charge per delay, sequence of blasting, designed blasting pattern, etc., are being taken to reduce the ground vibrations and to arrest fly rock. The blast ground vibrations and noise levels are being monitored as per DGMS guidelines.
	 Controlled blasting using delay detonators	 Blast vibration monitoring
(xxxii)	A progressive afforestation plan shall be implemented covering an area of 882.29 ha. at the end of mining, which includes	Plantation is being taken up along ML boundary, roads, service buildings and CHP and other areas within the lease by planting native species at a density of not less than 2500 nos. of plants/ha as per

	reclaimed External OB dump area (388.57 ha.), Internal OB dump area (261.93 ha.), and Green belt (231.79 ha.) in township located outside the lease by planting native species in consultation with the local DFO/ Agriculture 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.   Stabilized D 3 dump with plantation	EMP. Plantation is carried out with the following native species Hardwikiabinata, Dendrocalamusstrictus, Ficus religiosa, Azadirachta indica, Limoniaacidissima, Ficus bengalensis, Aegle marmelos, Mitragynaparvifolia, Dalbergia latifolia, Pterocarpus marsupium, Syzygiumcumini, Albizzia procera, Terminalia bellarica, Pongamia pinnata, Madhuka indica, Pithecelobiumdulci, Sterculia urens, Dalbergia sissoo, Bombax ceiba, Albizzia lebbek etc. The SCCL has a separate forestry department with qualified experts and supervisors headed by Advisor (Forestry), a retired PCCF. SCCL is maintaining a separate nursery at Goleti to serve the needs of Bellampalli mines. So far, 15,63,294 nos. of plants were planted in an area of 427.23 ha. up to 31.03.2022 i. Dump area- 372.45 ha (including internal dump of 29 ha) ii. Avenue & greenbelt area: 54.28 ha. The progressive reclamation activities will continue as per EMP and approved Mining Plan and Mine Closure Plan of Khairagura OC Expansion.  Avenue plantation along the main approach roads to the mine

		 Nursery at Goleti Area
(xxxiii)	An estimated total 578.49 Mm3 of OB will be generated during the entire life of the mine. Out of which 184.58 Mm3 of OB will be dumped in three external OB in an earmarked area covering 331.75 Ha. Of land. 393.91 Mm3 of OB will be dumped in one internal OB Dump in an earmarked area covering 280.98 ha. Of land. The maximum height of external OB dump will not exceed 90m. The maximum slope of the dump shall not exceed 28 degrees. Monitoring and management of reclaimed dump sites shall continue till the vegetation becomes self-sustaining and compliance status shall be submitted to MoEF and its Regional Office on yearly basis.	OB was dumped at three earmarked external dump sites. Presently, OB dumping is being done in one internal dump as envisaged in the approved EMP. So far, 179.641 MBCM of OB is dumped up to 31.03.2023 at three external dump sites. The present height of external dumps is D1-90 m., D2-90 m. and D3-120 m. in line with the EC condition (Corrigendum was issued by MoEF&CC, vide File No. J-11015/28 / 2013-IA.II(M) dt 20.01.2016 to this EC condition for max. dump height up to 120m). So far, 129.928 MBCM of OB is backfilled in 215.738 up to 31.03.2023 as per approved EMP and backfilled area reached +70m above ground level. The ultimate slope of the dump is less than 28 degrees. Year-wise reclamation is being taken up as per approved EMP. Back-filling operations started from January 2013 onwards and are under progress.  Over Burden Dump-D3 Monitoring and management of reclaimed dump sites is being done and will be continued until the vegetation becomes

		self-sustaining. The compliance status on progressive reclamation is being submitted to Ministry of Environment, Forests & Climate Change along with half yearly monitoring report.
(xxxiv)	The proponent should prepare restoration and reclamation plan for the degraded area. The land be used in a productive and sustainable manner.	The restoration and reclamation plan envisaged in the approved EMP is being implemented. Plantation is being done with native species to maintain sustainability. So far 129.928 MBCM of OB is backfilled in. 215.736 Ha up to 31.03.2023 as per approved EMP and backfilled area reached +70m above ground level So far 15,63,294 nos. of plants were planted in an area of 427.45 Ha. up to 31.03.2022, dump area- 372.45 Ha. (including 29 Ha internal dump), avenue & greenbelt area: 54.28Ha.
(xxxv)	Compensatory Ecological & Restoration of waste land, other degraded land and OB dumps in lieu of breaking open the land be carried out.  	SCCL has paid compensatory afforestation charges for taking up plantation in the non-forest land equivalent to the forest land diverted for the project. Equivalent extent i.e.140.30Ha. of non-forest land is handed over to Forest Department in Dhanwada & Kistapur villages in Mahaboobnagar Dist. SCCL has paid an amount of Rs.53,80,000/- to DFO, Mahaboobnagar vide cheque No.076559, dt 08.06.2002 towards Compensatory Afforestation while diversion of 140.30Ha. of forest land as per F.C. Lr.No. 8-102/2000-FC, dt. 10.09.2003. An extent i.e.29.85 Ha. Of non-forest land is handed over to Forest Department, Bellampalli Division in Kistampet and Venkatpalli villages of Tandur Mandal on 16.02.1999 and SCCL deposited Rs.11.84 lakhs with DFO, Bellampalli on 30.03.1999 while diversion of 29.85Ha. of forest land as per F.C. Lr. No. 8-28/94-FC, dt. 28.09.2000. Equivalent extent i.e.126.71 Ha. Of non-forest land identified in Sy. Nos. 168, 327 & 376 of Jagatpalli village, Peddamandadi (M) of Mahaboobnagar District forms part of 344.72 Ha. Handed over to forest department on 20.02.2007 and the said land had been mutated in favor of forest department on 23.02.2007

	  Plantation in 57.00Ha. of RF(degraded) land	The SCCL deposited Rs.127.00 lakhs through RTGS mode to the CAMPA account No.3449010070179 of Union Bank of India, New Delhi on 24.05.2010 towards CA while diversion of 126.71Ha. of forest land as per F.C. Ltr.No. 8-28/94-FC, dt. 01.07.2011. Plantation is also taken up by SCCL in 57.00Ha. of RF land in consultation with DFO., Asifabad division. The restoration and reclamation plan envisaged in the approved EMP is being implemented. So far 129.928 MBCM of OB is backfilled in. 215.736 up to 31.03.2023 as per approved EMP and backfilled area reached +70m above ground level So far 15,63,294 Nos. of plants were planted in KHOCP project area of 427.23 Ha. up to 31.03.2023 • dump area- 372.45 Ha. (including 29 Ha internal dump) • avenue & greenbelt area: 54.28Ha.
(xxxvi)	The mining should be phased out in sustainable manner. No extra over burden dumps are permitted.	The mining is being done in phased and sustainable manner by progressive reclamation of dumps and plantation concurrent with the progress of mining operations. OB dumping is being done in three external dumps and one internal dump as envisaged in approved EMP.
(xxxvii)	No groundwater shall be used for mining operations.	Groundwater is not being used for mining operations. Part of mine discharge water is being used for washing of HEMM, drinking, fire-fighting and dust suppression purposes.
(xxxviii)	Of the total quarry area of 542.91 ha, the backfilled quarry area of 261.93ha. shall be reclaimed with plantation and a void of 280.98ha. at a depth of 40m which is proposed to be converted into a water body shall be gently sloped and the upper benches shall be terraced and stabilized with plantation /afforestation by planting native plant species in consultation	The restoration and reclamation plan envisaged in the approved EMP is being implemented. The final voids of project will be filled at final stage as per approved final mine closure plan approved by MoC So far, 15,63,294 nos. of plants are planted in an area of 427.23 Ha. up to 31.03.2023

	with the local DFO/Agriculture Department. The density of the trees shall be around 2500 plants per ha.	
(xxxix)	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 quantity 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 the Ministry of Environment, Forests & Climate. Change and the Central Pollution Control Board quarterly within one month of monitoring.	Regular monitoring of ground water level and quality is being carried out by establishing a network of 5 nos. of piezometers and 14 nos. of existing open wells. The monitoring of quantity and quality is being done four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons. Data thus collected is being submitted to the MoEF&CC and to the State Pollution Control Board on half-yearly basis.  Piezometric well beside Gowarguda village
(xl)	The company shall put up artificial ground water recharge measures for augmentation of groundwater resource in case monitoring indicates a decline in water table. The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.	As per ground water level monitoring by CGWB, Tiryani Area is classified under ''Safe'' category in page no. 138 (Sl. No. 5380) as per the following URL. http://cgwb.gov.in/GW-Assessment/2021-08-02-GWRA-2020-BLOCKWISE%20MASTERSHEET.pdf  **Rain water recharge station at Gowarguda**

		 **Rain water recharge pit at Chopidi** However, three rain water recharge pits are provided in chopidi, gowarguda, rehabilitated Dorli villages near KH OCP. Eight nos. of settling ponds and six nos. of check dams are constructed in the project area which also serve the purpose of augmentation of ground water levels. The piezometric & phreatic wells monitoring data reveals that there is no adverse impact on ground water table due to mining activity. There is no incidence of drying of wells in nearby villages.
(xli)	Sewage treatment plant shall be installed in the existing colony. ETP shall also be provided for workshop and CHP wastewater.	Two Nos. of ETPs (each of 60 KLD capacity) were constructed at base workshop and pit head CHP for treating waste water. Presently, the sewage from Goleti township is being treated by conventional method i.e., septic tank followed by soak pit. The overflow water is being used for nursery plantation within the colony. SCCL is monitoring the quality of treated domestic effluents and the monitored values are well within the standards prescribed by CPCB. 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 backed out without completing STP construction 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. SCCL has taken up the construction of 2X100 KLD capacity STP in Goleti Township and 90% of the erection work has already been completed and the plant likely to be commissioned by the end of April 2023.  ETP at Base workshop  STP work is in progress
(xlii)	Besides carrying out regular periodic health check-up of their workers, 10% of the workers 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.	The Project Proponent is carrying out occupational health check-up for 20% of workmen every year in the area hospital with qualified doctors, staff & facilities as per statute.
(xliii)	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.	This EC is granted for enhancement of annual coal production capacity of the project from 3.0 MTPA to 3.75MTPA and no additional land is requisitioned. However, R&R plan was already implemented in the project for 558 families and there is no further R&R involved in the project.
(xliv)	For monitoring land use pattern and for post mining land use, a	Digital processing of entire lease area using remote sensing technique is being

	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 end of mine life shall be prepared once in 3 years (for any one particular season which is consistent in the time series), and the report submitted to MOEF&CC and its concerned regional office.	done regularly once in three years for monitoring land use pattern and latest reports. The study was previously carried out through M/s Geosys enterprise solutions pvt Ltd., during 2020 and the report was submitted to Regional Office of MoEF& CC.
(xlv)	A detailed Final Mine Closure Plan along with details of Corpus fund shall be submitted to the Ministry of Environment, Forests & Climate Change within 6 months of grant of Environmental clearance.	A progressive mining & mine closure plan along with the corpus fund details as approved by MoC was already submitted along with half yearly reports vide Lr.BPA/ENV/R-02/2015/98, dt:23.05.2015. To deposit cost of mine closure activities, ESCROW Account was opened bearing number 40107326854. The accumulated amount in the ESCROW Account including interest is Rs. 85.10 Crores. The final mine closure plan will be submitted after approval by MoC five years before the closure of the mine i.e., in the year 2025-26.
(xlvi)	The project authorities 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 life of the mine	The CSR activities are being taken up every year in consultation with the Panchayats of the local villages & administration. SCCL has laid down Corporate CSR policy and various developmental activities are being taken up in and around the project and the same will be continued till the end of the project. The company is ensuring that in every fiscal year it spends at least 2 percent of its average net profits from the three preceding fiscal years in pursuit of its CSR policy. SCCL has so far spent an amount of Rs. 22.25 Crores in the surrounding villages of Bellampalli Area. In addition to the above, an amount of Rs. 184.84 Crores was deposited with Komuram Bheem District Authorities towards District Mineral Foundation Trust (DMFT) for taking up developmental

<table>
<tr><td></td><td></td><td>activities in the project affected villages.</td></tr>
<tr><td>(xlvii)</td><td>Corporate Environment Responsibility:</td><td></td></tr>
<tr><td>a)</td><td>The company shall have a well laid down Environment Policy approved by the Board of Directors.</td><td>The SCCL has a well laid down Environment Policy approved by the Board of Directors on 01.11.2011.</td></tr>
<tr><td>b)</td><td>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.</td><td>The SCCL has a well laid down Environment Policy approved by the Board of Directors consisting standard operating process/procedures to bring into focus any infringements/ deviation/ violation of the environmental or forest norms/conditions.

The status of compliance of EC/FC is being appraised to SCCL Board of Directors once in three months as per Companies Act, 2013 by the project authorities.</td></tr>
<tr><td>c)</td><td>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.</td><td>The SCCL has a well-defined hierarchical system to deal with environmental issues and for ensuring compliance with the environmental clearance conditions.

A company level environment cell with qualified personnel headed by General Manager (Environment) who is directly reportable to the Chairman of the Company is established to monitor and guide in implementation of the environmental safeguards.

An area level environmental cell headed by qualified environmental officer is established and functioning under the control of Area General Manager to monitor and guide in implementation of the environmental safeguards.

Apart from this, a unit level Environmental Management Committee with multi-disciplinary team has been constituted under the chairmanship of SO to GM. The committee has been constituted with following members.
<table>
<tr><td>1.</td><td>SO to GM</td><td>Chairman</td></tr>
<tr><td>2.</td><td>Project officer</td><td>Member</td></tr>
<tr><td>3.</td><td>Area engineer (E&M)</td><td>Member</td></tr>
<tr><td>4.</td><td>Area civil engineer</td><td>Member</td></tr>
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		5. Area forest officer — Member 6. Area estates officer — Member 7. Project Manager — Member 8. Project engineer — Member 9. Project surveyor — Member 10. Project env.officer — Member 11. Area env. officer — Secretary 12. Sr.Hydro Geologist — Member 13. Area Survey Officer — Member 14. BaseWorkshop Incharge — Member
d)	To have proper checks and balance, 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.	SCCL is having a well laid down environmental policy duly approved by the Board of Directors. The environmental policy contains standard operating procedures to have proper checks and to bring into focus any violation of the environmental norms. The company has a well laid down system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the company and shareholders as well as status of compliance of other laws, rules, etc. i.e. once in three months under Companies Act, 2013.

S.No.	Condition	Compliance
4B: General conditions:		
(i)	No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment, Forests & Climate Change.	No changes are made in mining technology and scope of work. Shovel & dumper combination is being adopted in the project as envisaged in the approved EMP.
(ii)	No Change in the calendar plan of production for quantum of mineral coal shall be made.	There is no change in calendar programme of coal production as per sanctioned EC capacity. The year-wise coal production is shown below.

S. No	Year	Coal (in MT)	
		As per EC	Actual
1.	2015-16	3.75 (As per existing EC)	3.37
2.	2016-17		3.12
3.	2017-18		3.41
4.	2018-19		2.91

<table>
<tr><th>S.No.</th><th>Condition</th><th>Compliance</th></tr>
<tr><td colspan="3">4B: General conditions:</td></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>5.</td><td>2019-20</td><td></td><td>2.60</td></tr>
<tr><td>6.</td><td>2020-21</td><td></td><td>1.25</td></tr>
<tr><td>7.</td><td>2021-22</td><td></td><td>2.35</td></tr>
</table>
</td></tr>
<tr><td>(iii)</td><td>Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM_{10}, $PM_{2.5}$, SO_2 and NOx monitoring. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc carried out at least once in six months.</td><td>Eight Nos. of ambient air quality monitoring stations (four stations in core including one CAAQMS & four stations in buffer zone) have been established in the project.

The parameters, PM_{10}, $PM_{2.5}$, SO_2 and NOx are being monitored once in a fortnight. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc in coal and particulate matter is being carried out once in six months. The monitored data is being submitted to MoEF&CC and TSPCB on regular basis.

One continuous online ambient air quality station (CAAQMS) was established at the project in the year 2017-18 and connected to TSPCB for real time uploading of air quality data.

 
CAAQMS at the project site

The post project environment monitoring stations are identified in consultation with Regional Office, Telangana State Pollution Control Board, Nizamabad based on the meteorological data, topographical features and environmentally and ecologically sensitive targets.

The monitoring is being carried out regularly by the external agency i.e. “Environmental Protection Training and Research Institute” (EPTRI), Hyderabad which has a CPCB recognized & a NABL</td></tr>
</table>

S.No.	Condition	Compliance
4B: General conditions:		
		accredited lab.
(iv)	Data on ambient air quality (PM_{10} , $PM_{2.5}$, SO_2 and Nox) 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 once in six months. Random verification of samples through analysis from independent laboratories recognized under the EPA rules, 1986 shall be furnished as part of compliance report.	Data on ambient air quality (PM_{10}, $PM_{2.5}$, SO_2 and Nox) and heavy metals such as Hg, As, Ni, Cd, Cr, and other monitoring data is being regularly submitted to the Ministry including its concerned Regional Office and to the State Pollution Control Board once in six months along with half yearly reports. The SCCL entrusted the post project environmental monitoring work in all the mining areas to EPTRI, a CPCB recognized and NABL accredited laboratory. EPTRI is periodically participating in the proficiency testing conducted by CPCB and their performance in such tests is being verified to ensure quality of work.
(v)	Adequate measures shall be taken for control of noise levels 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.	Adequate measures are being taken for control of noise levels below 85 dBA in the work environment. Sound proof cabins are provided in HEMM. The periodic planned preventive maintenance & engine tuning of HEMM and other transport vehicles is being done at regular intervals as per schedules submitted by OEM (Original Equipment Manufacturer) to keep the noise levels below 85 dBA. To attenuate noise, plantation is being taken up every year as per approved EMP. The various measures are being taken up for control of noise levels below 85 dB(A) in the work environment. The persons engaged in high noise work environment such as drilling and blasting operations are being provided with earplugs. Controlled blasting techniques with the use of Non-electric (Nonel) delay detonators are being practiced to control ground vibrations, noise and fly rock. The ambient noise level in the work

S.No.	Condition	Compliance
4B: General conditions:		
		environment and nearby villages is being monitored regularly.
(vi)	Industrial waste water (workshop and waste water from the mine) shall be properly collected, treated so as to confirm to the standards prescribed under GSR 422(E) dt 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.	Two nos. of ETP's (each 60 KLD capacity) have been provided viz., one for base workshop and second one for pit head CHP. Periodical monitoring of effluents is being carried out to ensure compliance to prescribed standards.
(vii)	Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transporting the mineral shall be covered with tarpaulins and optimally loaded.	The periodic planned preventive maintenance & engine tuning of HEMM and other transport vehicles is being done at regular intervals as per schedules submitted by OEM to keep the vehicular emissions under control. Vehicles used for transporting of coal are being covered with tarpaulin and optimally loaded. The vehicular emissions are being monitored once in six months. Vehicles having valid PUC certificates from authorized pollution testing centres are only engaged.
(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 the State Pollution Control Board and data got analyzed through a laboratory recognized under EPA Rules, 1986.	The post project env. Monitoring stations are identified in consultation with Regional Office, Telangana State Pollution Control Board, Nizamabad based on the meteorological data, topographical features and environmentally and ecologically sensitive targets. Post project environmental monitoring work is being carried out by an external agency, i.e. "Environmental Protection Training and Research Institute" (EPTRI), Hyderabad which has a CPCB recognized & NABL accredited lab (recognized under EPA Rules, 1986). A regional environmental laboratory for Bellampalli region was established by M/s

S.No.	Condition	Compliance
4B: General conditions:		
		EPTRI at Mandamarri for monitoring of critical parameters.
(ix)	Personal working in dusty areas shall wear protective respiratory devices and they shall also be provided with adequate training and information on safety and health aspects.	Protective wear like dust respirators or dust masks are being provided to workmen exposed to dusty environment periodically and the adequate training is being imparted on safety and health aspects at the Mine Vocational Training Center provided at Goleti.
(x)	Occupational health surveillance programme of the workers shall be undertaken periodically to observe any contractions due to exposure to dust and to take corrective measures, if needed and records maintained 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.	The SCCL has well-established health centres (area hospitals) with qualified doctors & with all facilities as per NIOH, Ahmadabad (occupational health specialist) in each area for monitoring and identification of occupational diseases. Occupational health surveillance programme of the workers is being carried out to check the health profile of the workmen i.e. for the lung diseases, hearing impairment, eye testing, heart functioning, hypertension, diabetes, chest X-Ray, complete blood and urine picture, etc., and records are being maintained. Periodically Medical Examination (PME) is being done at an interval of once in five years for employees age up to 45 years, once in three years for employees age more than 45 years and eye refraction test is being done for vehicle drivers and HEMM operators at an interval of once in a year. In addition to above medical camps are being conducted at regular intervals at all SCCL areas with corporate hospital doctors, Hyd., for health check up of SCCL' employees. On medical referrals also SCCL's employees being sent to corporate hospitals, Hyd., for treatment on need basis. The health, and safety issues of the outsourced manpower are being addressed by the company while awarding

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<tr><td>(xi)</td><td>A separate Environmental management cell with suitable qualified personnel shall be set up under the control of a Senior Executive, who will report directly to the Head of the company.</td><td>A company level environment cell headed by General Manager (Environment) is established to monitor and guide in implementation of the environmental safeguards.

An area level environmental cell headed by qualified environmental officer is established and functioning under the control of area General Manager to monitor and guide in implementation of the environmental safeguards.

To carryout functions relating to environmental management at this project, an environment management committee (EMC) has been constituted with the following members:
<table>
<tr><td>1.</td><td>SO to GM</td><td>Chairman</td></tr>
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<tr><td>8.</td><td>Project engineer</td><td>Member</td></tr>
<tr><td>9.</td><td>Project surveyor</td><td>Member</td></tr>
<tr><td>10.</td><td>Project env.officer</td><td>Member</td></tr>
<tr><td>11.</td><td>Area env. officer</td><td>Secretary</td></tr>
<tr><td>12.</td><td>Sr.Hydro Geologist</td><td>Member</td></tr>
<tr><td>13.</td><td>Area Survey Officer</td><td>Member</td></tr>
<tr><td>14.</td><td>Base Workshop Incharge</td><td>Member</td></tr>
</table></td></tr>
<tr><td>(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><td>The funds earmarked for the environmental safeguards are being spent for environmental protection works only and not diverted for any other purpose.

Allocation made for environment management plan was with a capital cost of Rs. 20.02 Crores and revenue cost of Rs. 18.72 per Tonne (Rs. 4.64 Crores/Annum).

So far capital expenditure of Rs. 43.79 Crores and revenue expenditure: Rs.112.241 Crores was incurred in the project for environment management.</td></tr>
</table>

S.No.	Condition	Compliance
4B: General conditions:		
		The year-wise environmental expenditure is being submitted along with half yearly reports to the ministry and its regional office of MoEF&CC.
(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.	The project was granted EC, was advertised in widely circulated two local daily news papers i.e. in "Andhra Jyothi" (in Telugu language) & in "The Hindu" (in English language), dt: 06.03.2015. A copy of the Environmental Clearance letter was submitted to the Member Secretary, T.S.P.C.B., Hyderabad, vide Ltr.No.BPA/ENV/G-06/2015/30, dt: 21.02.2015.
(xiv)	A copy of the Environmental Clearance letter shall be marked to concern Panchayat/Zilla 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.	This condition was complied by marking a copy to the concerned vide Ltr.No.BPA/ENV/G-06/2015/30, dt. 21.02.2015. The Environmental Clearance letter is displayed on company's website i.e. www.scclmines.com.
(xv)	A copy of the environmental clearance letter 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 officer/ Tehasildar's Office for 30 days.	This condition was complied vide Ltr .No.BPA /ENV/G-06/2015/30, dt: 21.02.2015.
(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	The Environmental Clearance letter was displayed on company's website i.e. www. Scclmines.com. The compliance status of the stipulated environmental clearance conditions is being updated once in every six months

S.No.	Condition	Compliance
4B: General conditions:		
	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_{10} , $PM_{2.5}$, SO_2 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.	along half yearly monitoring report on company official website i.e. www.scclmines.com., so as to bring the same in public domain. The monitoring data of environmental quality parameters, Air, SW, GW, Effluents, Noise, etc. & critical pollutants PM_{10}, $PM_{2.5}$, SO_2 Nox etc. ambient air are regularly displayed at the entrance of the project premises and mine office, in corporate office and on company's website i.e. www.scclmines.com.
(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 Officer's of CPCB and the SPCB.	The updated half-yearly monitoring reports on status of compliance of the stipulated Environmental Clearance conditions is being submitted (both in hard copy, soft data in e-mail) once in every six months to the Regional Office, MoEF&CC and TSPCB.
(xviii)	The Regional office of this Ministry located in the Region shall monitor compliance 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.	The project authority is extending full cooperation to the office (s) of the regional office by furnishing the requisite data / information / monitoring reports.
(xix)	The Environmental statement for each financial year ending 31st March in Form-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.	The Environmental Statement for each financial year ending 31st March in Form-V is being submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently. The Environmental Statement in Form-V was uploaded on the company's website i.e.www.scclmines.com., and the status of compliance of EC conditions is being submitted to the respective Regional Offices of the MoEF&CC by e-mail once in every six months.

<table>
<tr><th>S.No.</th><th>Condition</th><th>Compliance</th></tr>
<tr><td colspan="3">4B: General conditions:</td></tr>
<tr><td>5</td><td>The proponent shall abide by all the commitments and recommendations made in the EIA/EMP report so also during their presentation to the EAC.</td><td>All commitments and recommendations made in the EIA / EMP report have been complied with.</td></tr>
<tr><td>6</td><td>The commitment made by the Proponent to the issue raised during Public Hearing shall be implemented by the Proponent.</td><td>This EC was granted for enhancement of annual production capacity of the project from 3.0 MTPA to 3.75MTPA under 25% expansion category as per OM No.J-11015/30/2004.IA.II(M), Dated: 19-12-2012 and public hearing was not required to be conducted in this case.

However, the commitments made in earlier PH were fulfilled by project authorities.</td></tr>
<tr><td>7</td><td>The Proponent is required to obtain all necessary clearance/approvals that may be required before the start of the project. The Ministry or any other competent authority may stipulate any further condition for environmental protection.</td><td>The project expansion operations started after obtaining all necessary clearances /approvals (CFE Order No.02/TSPCB /CFE/RO-NZM/HO/ 2015 / 693, dt:04.11.2015 & Consent Order Lr. No 220523658766 Dated:12.11.2022 & valid up to 30.09.2027

If any further conditions are stipulated by the ministry or by any other competent authority for environmental protection, the same will be obeyed & complied .</td></tr>
<tr><td>8</td><td>The Ministry or any other competent authority may stipulate any further condition for environmental protection.</td><td>If any further conditions if any stipulates by the ministry or any other competent authority for environmental protection, the same will be obeyed & complied.</td></tr>
<tr><td>9</td><td>The Proponent shall setup an Environment Audit cell with responsibility and accountability to ensure implementation of all the EC conditions.</td><td>An area level environment audit cell is setup with the following members under the chairmanship of SO to GM of area.
<table>
<tr><td>Sl.No</td><td>Designation</td><td></td></tr>
<tr><td>1</td><td>SO to GM</td><td>Chairman</td></tr>
<tr><td>2</td><td>Area Engineer (E&M)</td><td>member</td></tr>
<tr><td>3</td><td>DGM(Civil)</td><td>member</td></tr>
<tr><td>4</td><td>Area env.officer</td><td>member</td></tr>
</table>
The above audit cell is conducting meeting once in a month and auditing the condition wise compliance status of all the EC conditions. The above audit committees prepare an env. Audit report and advise</td></tr>
</table>

S.No.	Condition	Compliance
4B: General conditions:		
		project authority to initiate action for compliance of condition(s) of the EC after conducting meeting.
10	Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.	SCCL Agreed to this condition.
11	The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981 the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble Supreme Court of India/ High Courts and any other Court of Law relating to the subject matter. The proponent shall ensure to undertake and provide for the costs incurred for taking up remedial measures in case of soil contamination, contamination of ground water and surface water, and occupational and other diseases due to the mining operations.	CFE and CFO were obtained for the project under air and Water Acts. • CFE No.02/TSPCB/CFE/RO-NZM/HO/2015/693, dt:04.11.2015. • CFO Lr. No 220523658766 Dated:12.11.2022 & valid up to 30.09.2027 • PLI policy is also being taken every year. The latest PLI policy was taken from National insurance Company bearing no. 550200492210000013, dt. 30.04.2022 and is valid up to 29.04.2023. All measures are being taken to avoid soil contamination, contamination of ground water, surface water, and occupational and other diseases due to the mining operations.
12	Any appeal against this	SCCL Agreed to this condition.

S.No.	Condition	Compliance
4B: General conditions:		
	environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.	
13	This EC supersedes the earlier EC vide letter no. J-11015/36/2003-IA. II(M) dt 16.09.2004 for at a rated capacity of 0.72 MTPA in a lease area of 338.78 ha. And environmental clearance videMoEF letter No. J-11015/689/2007-IA-II(M), dt. 22.10.2007 for expansion in rated capacity from 0.72 MTPA to 2.5 MTPA with a peak production of 3 MTPA and increase in lease area from 338.78 ha. To 1217.50 ha.	SCCL Agreed to this condition.

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I. KHG OC MINE

1.0 AMBIENT AIR QUALTY MONITORING

1.1 AIR QUALITY MONITORING STATIONS

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"
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"
BA10	Rehabilitated Dorli Village	N 19° 17' 21.3"	E 79° 14' 04.1"

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"

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Table 1.0

Ambient Air Quality Monitoring Stations

S.No.	Station Code	Name of the Stations	Latitude	Longitude
CORE ZONE				
1	CA1	KHA OCP Project Office	N 19° 14' 07.8"	E 79° 17' 06.5"
2	CA2	KHA OCP Weigh Bridge	N 19° 14' 09"	E 79° 17' 02"
3	CA4	KHA OCP Weigh Bridge 2	N 19° 14' 01"	E 79° 17' 42"
BUFFER ZONE				
4	BA1	Goveriguda Village	N 19° 13' 55.6"	E 79° 16' 46.4"
5	BA2	Ullipitta Dorli Village	N 19° 16' 44.4"	E 79° 14' 29.8"
6	BA3	Pathibanda Village	N 19° 17' 49.4"	E 79° 15' 01.7"
7	BA10	Rehabilitated Dorli Village	N 19° 17' 21.3"	E 79° 14' 04.1"

**not carried out*

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Ambient Air Quality at KHA OCP Project Office (CA1)

(1)	Project Name	:	KhairaguraOpencast Expansion Project
(2)	Area	:	Bellampalli
(3)	Sampling Location & Code	:	KHA OCP Project Office (CA1)
(4)	Description of the location	:	Instrument was installed at a height of 3 meters on the top of the lamp house, surrounding to the station the following features were observed: The site is surrounded by Khairagura OCP mine activities at North, Followed by Forest area and Goverguda village at South. Quarry activities are carried out at East. Coal bunker and transportation road is observed at west. The site mainly lies in core zone.
(5)	Sampling Duration	:	24 hrs
(6)	Period of Monitoring	:	January 2023 - March 2023
(7)	Nature of the area	:	Core zone

Table 1.1

Ambient Air Quality at KHA OCP Project Office (CA1)

Sl. No.	Date of Sampling	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)
Coal mine standards, GSR 742(E), Dated 25.09.2000		250	-	120	120
1.	11.01.2023	176	70.0	17.3	20.9
2.	25.01.2023	180	77.4	16.9	19.8
3.	10.02.2023	184	75.0	17.3	20.3
4.	24.02.2023	179	76.3	16.8	19.7
5.	10.03.2023	181	79.3	17.1	20.0
6.	25.03.2023	185	76.9	17.7	20.6

- *No standard was specified for PM2.5 in core zone*

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Ambient Air Quality at KHA OCP Weigh Bridge (CA2)

(1)	Project Name	:	KhairaguraOpencast Expansion Project
(2)	Area	:	Bellampalli
(3)	Sampling Location & Code	:	KHA OCP Weigh Bridge (CA2)
(4)	Description of the location	:	Instrument was installed at a height of 3 meters on the top of the lamp house, surrounding to the station the following features were observed: The site is surrounded by Khairagura OCP mine activities in North, Coal bunker and transportation road is in West, Quarry activities in East, Forest area and Goverguda Village is observed in South. The site mainly lies in Core zone.
(5)	Sampling Duration	:	24 hrs
(6)	Period of Monitoring	:	January 2023 - March 2023
(7)	Nature of the area	:	Core zone

Table 1.2

Ambient Air Quality at KHA OCP Weigh Bridge (CA2)

Sl. No.	Date of Sampling	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
Coal mine standards, GSR 742(E), Dated 25.09.2000		250	-	120	120
1.	11.01.2023	195	81.3	19.4	22.3
2.	25.01.2023	199	85.0	18.2	21.8
3.	10.02.2023	191	83.6	18.6	21.1
4.	24.02.2023	188	80.7	17.9	20.3
5.	10.03.2023	192	82.9	18.2	21.2
6.	25.03.2023	196	80.0	18.8	21.7

- No standard was specified for PM2.5in core zone

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Ambient Air Quality at KHA OCP Weigh Bridge 2 (CA4)

(1)	Project Name	:	Khairagura Opencast Expansion Project
(2)	Area	:	Bellampalli
(3)	Sampling Location & Code	:	KHA OCP Weigh Bridge 2 (CA4)
(4)	Description of the location	:	Instrument was installed at a height of 4 meters on the top of the Weigh bridge, surrounding to the station the following features were observed: The site is surrounded by Khairagura OCP OB dump activities in North, KHA OCP is in West, Quarry activities in East, Coal transportation road is observed in South & East. The site mainly lies in Core zone.
(5)	Sampling Duration	:	24 hrs
(6)	Period of Monitoring	:	January 2023 - March 2023
(7)	Nature of the area	:	Core zone

Table 1.3
Ambient Air Quality at KHA OCP Weigh Bridge 2 (CA4)

Sl. No.	Date of Sampling	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
Coal mine standards, GSR 742(E), Dated 25.09.2000		250	-	120	120
1.	11.01.2023	189	73.8	18.1	21.3
2.	25.01.2023	195	83.6	17.3	20.6
3.	10.02.2023	188	77.4	17.7	20.1
4.	24.02.2023	180	73.8	16.7	19.8
5.	10.03.2023	186	80.0	17.0	20.2
6.	25.03.2023	181	77.4	17.4	20.7

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Ambient Air Quality at Goveriguda Village (BA1)

(1)	Project Name	:	KhairaguraOpencast Expansion Project
(2)	Area	:	Bellampalli
(3)	Sampling Location & Code	:	Goveriguda Village (BA1)
(4)	Description of the location	:	Instrument was installed at a height of 3 meters on the top of Sri AtharamSomu's house, surrounding to the station the following features was observed: The site is surrounded by Khairagura OCP mine and coal transportation road a North, followed by Forest area at South, East & West direction Quarry activities are observed at East. The site area mainly lies in buffer zone
(5)	Sampling Duration	:	24 hrs
(6)	Period of Monitoring	:	January 2023 - March 2023
(7)	Nature of the area	:	Buffer zone

Table 1.4
Ambient Air Quality at Goveriguda Village (BA1)

Sl. No.	Date of Sampling	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
NAAQ Standards, CPCB Dated : 18.11.2009		100	60	80	80
1.	14.01.2023	61	30.5	10.2	13.0
2.	30.01.2023	64	28.8	10.8	13.8
3.	14.02.2023	59	28.3	10.1	12.9
4.	28.02.2023	55	27.8	9.9	12.0
5.	14.03.2023	60	28.8	10.3	13.0
6.	29.03.2023	63	29.7	11.2	14.0

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Ambient Air Quality at Ullipitta Dorli Village (BA2)

1)	Project Name	:	KhairaguraOpencast Expansion Project
2)	Area	:	Bellampalli
3)	Sampling Location & Code	:	Ullipitta Dorli Village (BA2)
4)	Description of the location	:	Instrument wasinstalled at a height of 4.5 meters on the top of Sri Ramu's house, surrounding to the station the following features were observed: The site is surrounded by Dorli village in North direction, followed by thiryani road and forest area in south. Dumping yard is observed in East, Vattivagu project is observed in West. The site is mainly lies at buffer zone
5)	Sampling Duration	:	24 hrs
6)	Period of Monitoring	:	January 2023 - March 2023
7)	Nature of the area	:	Buffer zone

Table 1.5

Ambient Air Quality at Ullipitta Dorli Village (BA2)

Sl. No.	Date of Sampling	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
NAAQ Standards, CPCB Dated : 18.11.2009		100	60	80	80
1.	13.01.2023	57	27.8	9.8	12.6
2.	28.01.2023	60	27.3	9.4	12.0
3.	13.02.2023	56	27.8	8.9	11.7
4.	27.02.2023	50	25.9	8.1	11.2
5.	13.03.2023	53	26.8	9.1	12.1
6.	28.03.2023	56	27.0	9.8	12.5

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Ambient Air Quality at Pathibanda Village (BA3)

(1)	Project Name	:	KhairaguraOpencast Expansion Project
(2)	Area	:	Bellampalli
(3)	Sampling Location & Code	:	Pathibanda Village (BA3)
(4)	Description of the location	:	Instrument wasinstalled at a height of 3.5 meters on the top of Ms. Parvathi Bhai's house, surrounding to the station the following features were observed: The site is surrounded by Road connecting to Asifabad in North, Agricultural area and hills are observed in south, East & West. The site mainly lies in buffer zone.
(5)	Sampling Duration	:	24 hrs
(6)	Period of Monitoring	:	January 2023 - March 2023
(7)	Nature of the area	:	Buffer zone

Table 1.6

Ambient Air Quality at Pathibanda Village (BA3)

Sl. No.	Date of Sampling	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
NAAQ Standards, CPCB Dated : 18.11.2009		100	60	80	80
1.	13.01.2023	54	27.0	9.5	12.9
2.	28.01.2023	57	27.8	8.8	11.7
3.	13.02.2023	50	25.9	8.2	11.1
4.	27.02.2023	47	23.1	7.9	10.5
5.	13.03.2023	51	25.0	8.4	11.2
6.	28.03.2023	49	23.1	9.0	12.4

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Ambient Air Quality at Rehabilitated Dorli Village (BA10)

(1)	Project Name	:	Khairagura Opencast Expansion Project
(2)	Area	:	Bellampalli
(3)	Sampling Location & Code	:	Rehabilitated Dorli Village (BA10)
(4)	Description of the location	:	Instrument was installed at a height of 2.5 meters on the top of Smt. B. Ambubai's house, surrounding to the station the following features were observed: The site is surrounded by Agriculture lands near Pathibanda Village in North, followed by forest area in South & West. Dorli OCP-I mine is observed in East. The site is mainly lies in buffer zone
(5)	Sampling Duration	:	24 hrs
(6)	Period of Monitoring	:	January 2023 - March 2023
(7)	Nature of the area	:	Buffer zone

Table 1.7
Ambient Air Quality at Rehabilitated Dorli Village (BA10)

Sl. No.	Date of Sampling	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
NAAQ Standards, CPCB Dated : 18.11.2009		100	60	80	80
1.	11.01.2023	52	25.9	9.0	12.7
2.	25.01.2023	55	25.0	9.6	12.2
3.	10.02.2023	49	23.8	8.5	11.9
4.	24.02.2023	45	21.8	8.3	11.0
5.	10.03.2023	49	25.4	9.3	12.0
6.	25.03.2023	46	23.5	9.7	12.9

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2.0 AMBIENT NOISE LEVELS

2.1 NOISE QUALITY MONITORING

Table 2.0 Noise Monitoring Locations

Station Code	Name of the Stations	Latitude	Longitude
Core Zone			
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"
Buffer Zone			
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"

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Table 2.1 Summary of Noise Levels

Location Code	Monitoring Stations	Standard limits of Noise		January, 1st Fortnight			January, 2nd Fortnight		
				Noise levels in dB (A)					
		Day Time	Night time	Date of Sampling	Leq Day	Leq Night	Date of Sampling	Leq Day	Leq Night
Core Zone									
CN1	KHA OCP Project Office	75	70	11.01.2023	61.2	49.6	25.01.2023	61.8	50.8
CN2	KHA OCP Weigh Bridge	75	70	11.01.2023	62.7	50.9	25.01.2023	63.1	51.2
Buffer Zone									
BN1	UllipittaDorli Village	55	45	13.01.2023	49.5	39.6	28.01.2023	49.0	38.6
BN2	Pathibanda Village	55	45	13.01.2023	48.3	37.7	28.01.2023	48.8	38.2

Location Code	Monitoring Stations	Standard limits of Noise		February, 1st Fortnight			February, 2nd Fortnight		
				Noise levels in dB (A)					
		Day time	Night time	Date of Sampling	Leq Day	Leq Night	Date of Sampling	Leq Day	Leq Night
Core Zone									
CN1	KHA OCP Project Office	75	70	10.02.2023	62.3	50.1	24.02.2023	60.8	49.5
CN2	KHA OCP Weigh Bridge	75	70	10.02.2023	63.6	51.9	24.02.2023	62.3	50.8
Buffer Zone									
BN1	UllipittaDorli Village	55	45	13.02.2023	48.9	38.1	27.02.2023	48.1	38.6
BN2	Pathibanda Village	55	45	13.02.2023	47.9	37.9	27.02.2023	47.3	37.1

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Location Code	Monitoring Stations	Standard limits of Noise		March, 1st Fortnight			March, 2nd Fortnight		
				Noise levels in dB (A)					
		Day Time	Night time	Date of Sampling	Leq Day	Leq Night	Date of Sampling	Leq Day	Leq Night
Core Zone									
CN1	KHA OCP Project Office	75	70	10.03.2023	61.3	49.0	25.03.2023	61.9	49.8
CN2	KHA OCP Weigh Bridge	75	70	10.03.2023	62.7	51.3	25.03.2023	63.2	51.8
Buffer Zone									
BN1	UllipittaDorli Village	55	45	13.03.2023	49.0	39.2	28.03.2023	49.5	39.9
BN2	Pathibanda Village	55	45	13.03.2023	48.1	38.0	28.03.2023	48.7	38.8

Note: 1. Daytime is reckoned in between 6 a.m and 10 p.m *2. Night time is reckoned in between 10 p.m and 6 a.m*

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3.0 EFFLUENTS

Table 3.1 Effluents sampling locations

Sl. No.	Sample code	Name of the Location	Latitude	Longitude
1.	EW1	Khairagura Expansion OCP Mine Discharge	N 19° 14' 20.8"	E 79° 16' 25.9"
2.	EW2*	Khairagura Expansion OCP OB Dump Surface Runoff-Settling Pond Outlet	N 19° 15' 21.81"	E 79° 16' 22.79"
3.	EW3	Khairagura Expansion OCP Base Workshop ETP Outlet	N 19° 14' 7.1"	E 79° 17' 2.2"
4.	EW4	Khairagura Expansion OCP CHP ETP Outlet	N 19° 14' 10.3"	E 79° 16' 57.5"
5.	EW12	Goleti Township Treated Sewage Effluent	N 19° 13' 58.371"	E 79° 23' 8.3976"

**found to be dry*

(1) Project Name : Khairagura Opencast Expansion Project
(2) Area : Bellampalli
(3) Sampling Location & Code : Khairagura Expansion OCP Mine Discharge (EW1)
(4) Nature of the Component : Effluents
(5) Period of Monitoring : January 2023 - March 2023

Table 3.2
Characteristics of Effluents – Khairagura Expansion OCP Mine Discharge (EW1)

S.No.	Date of Sampling	pH	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	IS 3025	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.	13.01.2023	7.4	25	1058	15	1.8	<1
2.	31.01.2023	7.7	18	943	19	2.8	1.0
3.	13.02.2023	7.7	15	836	12	2.0	<1
4.	28.02.2023	8.2	29	988	24	2.5	1
5.	14.03.2023	7.4	34	897	31	3.1	1.2
6.	28.03.2023	7.7	41	910	28	2.6	1

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1.	Project Name	:	Khairagura Opencast Expansion Project
2.	Area	:	Bellampalli
3.	Sampling Location & Code	:	Khairagura Expansion OCP Base Workshop ETP Outlet (EW3)
4.	Nature of the Component	:	Effluents
5.	Period of Monitoring	:	January 2023 - March 2023

Table 3.3
Characteristics of Effluents – Khairagura Expansion OCP Base Workshop ETP Outlet (EW3)

S.No.	Date of Sampling	pH	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	IS 3025	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.	13.01.2023	7.7	43	1296	39	8.6	2.2
2.	31.01.2023	7.9	37	1128	23	5.2	1.8
3.	13.02.2023	7.6	31	978	31	6.0	1.4
4.	28.02.2023	7.9	69	1271	56	14	3
5.	14.03.2023	7.7	76	1023	51	15.2	2.8
6.	28.03.2023	7.6	56	1081	63	14.2	3

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1. Project Name : Khairagura Opencast Expansion Project
2. Area : Bellampalli
3. Sampling Location & Code : Khairagura Expansion OCP CHP ETP Outlet (EW4)
4. Nature of the Component : Effluents
5. Period of Monitoring : January 2023 - March 2023

Table 3.4
Characteristics of Effluents – Khairagura Expansion OCP CHP ETP Outlet (EW4)

S.No.	Date of Sampling	pH	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	IS 3025	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.	13.01.2023	7.9	67	1107	27	5.0	1.4
2.	31.01.2023	7.6	31	1315	19	3.2	1.0
3.	13.02.2023	7.5	26	1090	24	4.4	1.2
4.	28.02.2023	8.1	41	987	28	3	1
5.	14.03.2023	8.2	33	881	23	2.6	<1
6.	28.03.2023	7.9	62	794	20	2.2	<1

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1	Project Name	:	Others
2	Area	:	Bellampalli
3	Sampling Location & Code	:	Goleti Township Treated Sewage Effluent (EW12)
4	Nature of the Component	:	Effluents
5	Period of Monitoring	:	January 2023 - March 2023

Table 3.5
Characteristics of Effluents – Goleti Township Treated Sewage Effluent (EW12)

S.No.	Date of Sampling	pH	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	IS 3025	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.	13.01.2023	7.5	92	1526	46	13.6	2.4
2.	31.01.2023	7.8	66	1248	58	22.0	2.2
3.	13.02.2023	7.4	53	1122	83	28.2	1.8
4.	28.02.2023	6.8	48	1018	48	13.0	1
5.	14.03.2023	7.8	61	1255	35	10.2	1.2
6.	28.03.2023	7.5	42	1096	32	8.6	<1

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4.0 WATER QUALITY

4.1 Selection of Sampling Locations

A total of 4 water samples i.e., 2 samples from surface and 2 samples from groundwater were collected and analyzed for various physico-chemical and bacteriological parameters.

Table 4.1 Surface Water Sampling Locations

S.No.	Sample code	Date of Sampling	Sampling Location	Latitude	Longitude
1	SW-1	24.1.2023	Vatti Vagu U/S	N 19° 14' 53.0"	E 79° 16' 03.1"
2	SW-2	24.1.2023	Vatti Vagu D/S	N 19° 17' 35.7"	E 79° 15' 23.1"

Table 4.2 Groundwater Sampling Locations

Sl. No	Sample Code	Date of sampling	Sampling Location	Latitude	Longitude
1.	GW-1	24.1.2023	Ullipitta Dorli Village	N 19° 16' 44.6"	E 79° 14' 29.6"
2.	GW-2	24.1.2023	Pathibanda Village	N 19° 17' 49.3"	E 79° 15' 02.2"

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Table 4.3 Physico-Chemical and Bacteriological Characteristics of Surface Water

Table 4.3.1 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	7.8	8.0
2	Electrical Conductivity	µmhos/cm	2510-B	-	-	-	-	2250 µmhos/cm	628	542
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	-	5.6	5.8
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	-	-	2.6	1.6
5	Total Coliforms	MPN/100mL	9221 B	50 or less	500 or less	5000 or less	-	-	170	110
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	0.14	0.08
8	SAR	-	-	-	-	-	-	Less than 26	1.19	1.29

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Table 4.3.2 Physico-Chemical Characteristics of Surface Water at Selected Locations in the Study Area

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	ºC	2550. B	25.0	25.1
4	Turbidity	NTU	2130. B	2.2	1.4
5	Total Dissolved Solids at 180º C	mg/L	2540.C	369	320
6	Total Suspended Solids at 105º C	mg/L	2540. D	21	15
7	Chemical Oxygen Demand	mg/L	5220. D	28	20
8	Chlorides as Cl^-	mg/L	4500-Cl^-.B	59	50
9	Sulphates as SO_4^{2-}	mg/L	4500-SO_4^{2-}.E	38	24
10	Fluoride as F^-	mg/L	4500-F^-.C	0.53	0.3
11	Calcium as Ca	mg/L	3500-Ca.B	44	34
12	Magnesium as Mg	mg/L	3500-Mg.B	33	26
13	Sodium as Na	mg/L	3500-Na.B	43	41
14	Potassium as K	mg/L	3500-K.B	3.6	2.6
15	Nitrites as NO_2	mg/L	4500-NO_2^-.B	0.52	0.15
16	Nitrates as NO_3	mg/L	4500-NO_3^-.B	7	1
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_6H_5OH	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	215	225
23	Fecal Coliforms	MPN/100mL	9221 E	22	23
24	Zinc as Zn	mg/L	3120. B	0.18	0.31
25	Iron as Fe	mg/L	3120. B	0.41	0.58

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S. No	Parameters	Unit	Test Method	SW-1 Vatti Vagu U/S	SW-2 Vatti Vagu D/S
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

Table 4.4 Physico-Chemical, Bacteriological Characteristics of Groundwater Collected within the Study Area

Table 4.4.1 Organoleptic and Physical Parameters

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 Pathibanda 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	7.0	7.0
4.	Taste	FTN	2160. B	Agreeable	Agreeable	Agree.	Agree.
5.	Turbidity	NTU	2130. B	1	5	0.34	0.56
6.	Total Dissolved Solids at 180° C	mg/L	2540.C	500	2000	512	525

Table 4.4.2 General Parameters Concerning Substances Undesirable in Excessive Amounts

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 Pathibanda Village
1.	Calcium as Ca	mg/L	3500-Ca.B	75	200	70	76
2.	Magnesium as Mg	mg/L	3500-Mg.B	30	100	49	53
3.	Chlorides as Cl-	mg/L	4500-Cl-.B	250	1000	41	55
4.	Sulphates as SO42-	mg/L	4500-SO42- .E	200	400	68	57
5.	Fluoride as F-	mg/L	4500-F-.C	1.0	1.5	0.5	0.67
6.	Nitrates as NO3	mg/L	4500-NO3-.B	45	No relaxation	34	54
7.	Total Alkalinity as CaCO3	mg/L	2320. B	200	600	340	300
8.	Total Hardness as CaCO3	mg/L	2340. C	200	600	376	410
9.	Sulphide as H_2S	mg/L	4500-S2-F&D	0.05	No relaxation	BDL	BDL
10.	Total Ammonia-N	mg/L	IS 3025 (Part 34)	0.5	No relaxation	BDL	BDL
11.	Phenolic compounds as C6H5OH	mg/L	5530-D	0.001	0.002	BDL	BDL
12.	Residual free chlorine	mg/L	4500-Cl-.B	0.2	1.0	BDL	BDL
13.	Mineral oil	mg/L	IS:3025 (part 39)	0.5	No relaxation	absent	absent
14.	Anionic Detergents (as MBAS)	mg/L	IS:13428:2005K	0.2	1.0	<0.2	<0.2
15.	Aluminium as Al	mg/L	3120-B	0.03	0.2	0.06	BDL
16.	Barium as Ba	mg/L	3120. B	0.7	No relaxation	0.28	0.35
17.	Boron as B	mg/L	3120-B	0.5	2.4	0.14	0.20
18.	Iron as Fe	mg/L	3120-B	1.0	No relaxation	0.56	0.45
19.	Zinc as Zn	mg/L	3120-B	5	15	0.23	0.19
20.	Copper as Cu	mg/L	3120-B	0.05	1.5	BDL	BDL
21.	Manganese as Mn	mg/L	3120-B	0.1	0.3	BDL	BDL
22.	Selenium as Se	mg/L	3120-B	0.01	No relaxation	BDL	BDL
23.	Silver as Ag	mg/L	3120. B	0.1	No relaxation	BDL	BDL

Table 4.4.3 Parameters Concerning Toxic Substances

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 Pathibanda Village
1	Cadmium as Cd	mg/L	3120-B	0.003	No relaxation	BDL	BDL
2	Cyanide as CN-	mg/L	4500-CN-.F	0.05	No relaxation	BDL	BDL
3	Lead as Pb	mg/L	3120-B	0.01	No relaxation	BDL	BDL
4	Molybdenum as Mo	mg/L	3120. B	0.07	No relaxation	BDL	BDL
5	Nickel as Ni	mg/L	3120-B	0.02	No relaxation	BDL	BDL
6	Total Arsenic as As	mg/L	3120-B	0.01	0.05	BDL	BDL
7	Total Chromium as Cr	mg/L	3120-B	0.05	No relaxation	BDL	BDL
8	Mercury as Hg	µg/L	3500-Hg.B	0.001	No relaxation	BDL	BDL
9	**Pesticides:** α–BHC, β-BHC, γ-BHC, δ-BHC, o, p-DDT, p, p' –DDT, Endosulfan, β- Endosulfan, Aldrin, Dieldrin	µg/L	6630. D	Absent	0.001	ND	ND
	2,4-D, Carboryl (Carbonate) Malathion Methyl Parathion Anilophos, Chloropyriphos	Qualitative analysis	6630. D	Absent	0.001	ND	ND
10	**Polyaromatic Hydrocarbons (PAH's):** Acenaphthene, Acenaphthylene, Anthracene, B(a)A, B(a)P, B(b)F, B(k)F, Pyrene, Dibenz (a,h) anthracene, Fluoranthene, Fluorene, Indeno (1,2,3-(d) Pyrene, Naphthalene, Phenanthrene, Pyrene, Methyl Naphthalene	µg/L	6440.C	-	-	ND	ND

Table 4.4.4 Bacteriological Quality of Drinking Water

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 Pathibanda Village
1	Total Coliforms	MPN/100 mL	9221B	-	-	<1.8	<1.8
2	Fecal Coliforms	MPN/100 mL	9221 E	-	-	<1.8	<1.8

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4.2 Summary of Water Quality

4.2.1 Surface Water Quality

Comparison with CPCB Water Quality Criteria

The major findings are as follows: pH values were found to be 7.8 & 8.0 for SW-1, SW-2 samples. Total coliforms and fecal coliforms were present in both the surface water samples collected in the study area. Presence of total coliforms, fecal coliforms shows contamination from fecal matter or sewage entry and not suitable for direct drinking purpose and needs chlorination before treatment.

In accordance with CPCB water quality criteria, parameters studied were pH, DO, BOD and total coliforms. It may be observed that both the surface water samples have DO values ranging 5.6 & 5.8 mg/L and BOD was found to be 2.6 & 1.6mg/L in SW-1 & SW-2. Total coliforms are recorded as 170 & 110 MPN/100ml and fecal coliforms are recorded as 22 & 23 MPN/100ml in the given samples.

Both the surface water samples, Vatti Vagu U/S SW-1, Vatti Vagu D/S SW-2 fall under the CPCB water quality criteria Class–B (Outdoor bathing (Organized) as the DO is satisfactory and above 5mg/L and BOD is within the limit and Total coliforms are less than 500 MPN/100 ml.

In addition to the CPCB criteria parameters, another 32 parameters were also investigated and there are no abnormalities observed in both samples.

4.2.2 Groundwater Quality

The analytical reports show pH values range 7.0 in both GW-1 & GW-2 samples collected within the study area. Some water samples are exceeding the acceptable limits of IS: 10500:2012 but within the permissible limits. Because of underground strata, the parameters might have exceeded.

TDS concentrations were observed to be above the acceptable limit of 500mg/L but within the permissible limit of 2000mg/L at both locations, GW-1, 2 (512, 525mg/L). Magnesium concentrations were observed to be above the acceptable limit of 30mg/L but within the permissible limit of 100mg/L at both locations, GW-1, 2 (49, 53mg/L). Calcium concentration is observed to be slightly above the acceptable limit of 75mg/L but within the permissible limit of 200mg/L at GW-2 (76mg/L) and within the limit in other sample. Nitrates concentration is observed to be above the permissible limit of 45mg/L at Pathibanda GW-2 (54mg/L) and within the limit in other sample. Chlorides, Fluoride, Sulphates, Iron concentrations were below the acceptable limit at both locations.

The total alkalinity (340, 300mg/L) & total hardness (376, 410mg/L) concentrations are above the acceptable limit of 200mg/L but permissible limit of 600mg/L in both samples GW-1, 2.

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Groundwater quality at Ullipitta Dorli Village (GW-1):

In this location, all the parameters are well within the limits. So, the groundwater may be used for drinking purpose in the absence of any alternative drinking water source as few parameters exceeded the acceptable limits; however, they are well within in the permissible limits. Groundwater at this location possesses temporary hardness due to the presence of bicarbonates of calcium and magnesium which can be removed by boiling water.

Groundwater quality at Pathibanda village (GW-2):

In this location, all the parameters are well within the limits except Nitrates. Excess nitrate concentrations may be due to the fertilizers runoff from the agricultural areas, as well as the untreated disposal of domestic and industrial wastewater into the environments. Treatment of such water includes anionic ion exchange, reverse osmosis, distillation and/or deionization.

The graphical presentation for Nitrates exceeding the permissible limits is shown in Fig 4.1.

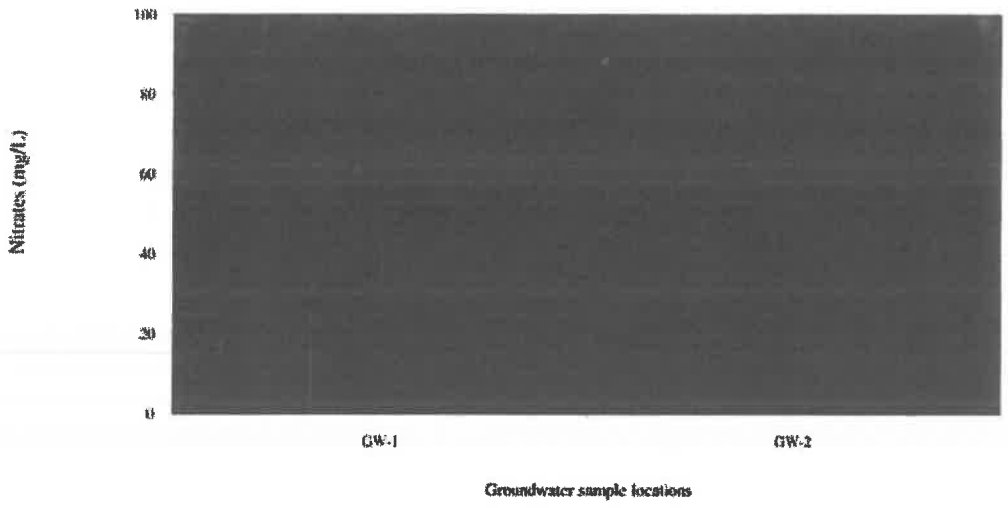

Fig:4.1 Graphical presentation of Nitrates Concentrations

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1.0 AMBIENT AIR QUALTY MONITORING

1.1 AIR QUALITY MONITORING STATIONS

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"
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"
BA10	Rehabilitated Dorli Village	N 19° 17' 21.3"	E 79° 14' 04.1"

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"

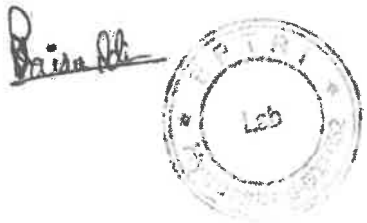

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Table 1.0

Ambient Air Quality Monitoring Stations

S.No.	Station Code	Name of the Stations	Latitude	Longitude
CORE ZONE				
1	CA1	KHA OCP Project Office	N 19° 14' 07.8"	E 79° 17' 06.5"
2	CA2	KHA OCP Weigh Bridge	N 19° 14' 09"	E 79° 17' 02"
3	CA4	KHA OCP Weigh Bridge 2	N 19° 14' 01"	E 79° 17' 42"
BUFFER ZONE				
4	BA1	Goveriguda Village	N 19° 13' 55.6"	E 79° 16' 46.4"
5	BA2	Ullipitta Dorli Village	N 19° 16' 44.4"	E 79° 14' 29.8"
6	BA3	Pathibanda Village	N 19° 17' 49.4"	E 79° 15' 01.7"
7	BA10	Rehabilitated Dorli Village	N 19° 17' 21.3"	E 79° 14' 04.1"

**not carried out*

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Ambient Air Quality at KHA OCP Project Office (CA1)

(1)	Project Name	:	KhairaguraOpencast Expansion Project
(2)	Area	:	Bellampalli
(3)	Sampling Location & Code	:	KHA OCP Project Office (CA1)
(4)	Description of the location	:	Instrument was installed at a height of 3 meters on the top of the lamp house, surrounding to the station the following features were observed: The site is surrounded by Khairagura OCP mine activities at North, Followed by Forest area and Goverguda village at South. Quarry activities are carried out at East. Coal bunker and transportation road is observed at west. The site mainly lies in core zone.
(5)	Sampling Duration	:	24 hrs
(6)	Period of Monitoring	:	January 2023 - March 2023
(7)	Nature of the area	:	Core zone

Table 1.1

Ambient Air Quality at KHA OCP Project Office (CA1)

Sl. No.	Date of Sampling	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
Coal mine standards, GSR 742(E), Dated 25.09.2000		250	-	120	120
1.	11.01.2023	176	70.0	17.3	20.9
2.	25.01.2023	180	77.4	16.9	19.8
3.	10.02.2023	184	75.0	17.3	20.3
4.	24.02.2023	179	76.3	16.8	19.7
5.	10.03.2023	181	79.3	17.1	20.0
6.	25.03.2023	185	76.9	17.7	20.6

- *No standard was specified for PM2.5 in core zone*

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Ambient Air Quality at KHA OCP Weigh Bridge (CA2)

(1)	Project Name	:	KhairaguraOpencast Expansion Project
(2)	Area	:	Bellampalli
(3)	Sampling Location & Code	:	KHA OCP Weigh Bridge (CA2)
(4)	Description of the location	:	Instrument was installed at a height of 3 meters on the top of the lamp house, surrounding to the station the following features were observed: The site is surrounded by Khairagura OCP mine activities in North, Coal bunker and transportation road is in West, Quarry activities in East, Forest area and Goverguda Village is observed in South. The site mainly lies in Core zone.
(5)	Sampling Duration	:	24 hrs
(6)	Period of Monitoring	:	January 2023 - March 2023
(7)	Nature of the area	:	Core zone

Table 1.2

Ambient Air Quality at KHA OCP Weigh Bridge (CA2)

Sl. No.	Date of Sampling	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
Coal mine standards, GSR 742(E), Dated 25.09.2000		250	-	120	120
1.	11.01.2023	195	81.3	19.4	22.3
2.	25.01.2023	199	85.0	18.2	21.8
3.	10.02.2023	191	83.6	18.6	21.1
4.	24.02.2023	188	80.7	17.9	20.3
5.	10.03.2023	192	82.9	18.2	21.2
6.	25.03.2023	196	80.0	18.8	21.7

- No standard was specified for PM2.5in core zone

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Ambient Air Quality at KHA OCP Weigh Bridge 2 (CA4)

(1)	Project Name	:	Khairagura Opencast Expansion Project
(2)	Area	:	Bellampalli
(3)	Sampling Location & Code	:	KHA OCP Weigh Bridge 2 (CA4)
(4)	Description of the location	:	Instrument was installed at a height of 4 meters on the top of the Weigh bridge, surrounding to the station the following features were observed: The site is surrounded by Khairagura OCP OB dump activities in North, KHA OCP is in West, Quarry activities in East, Coal transportation road is observed in South & East. The site mainly lies in Core zone.
(5)	Sampling Duration	:	24 hrs
(6)	Period of Monitoring	:	January 2023 - March 2023
(7)	Nature of the area	:	Core zone

Table 1.3
Ambient Air Quality at KHA OCP Weigh Bridge 2 (CA4)

Sl. No.	Date of Sampling	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
Coal mine standards, GSR 742(E), Dated 25.09.2000		250	-	120	120
1.	11.01.2023	189	73.8	18.1	21.3
2.	25.01.2023	195	83.6	17.3	20.6
3.	10.02.2023	188	77.4	17.7	20.1
4.	24.02.2023	180	73.8	16.7	19.8
5.	10.03.2023	186	80.0	17.0	20.2
6.	25.03.2023	181	77.4	17.4	20.7

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Ambient Air Quality at Goveriguda Village (BA1)

(1)	Project Name	:	KhairaguraOpencast Expansion Project
(2)	Area	:	Bellampalli
(3)	Sampling Location & Code	:	Goveriguda Village (BA1)
(4)	Description of the location	:	Instrument was installed at a height of 3 meters on the top of Sri AtharamSomu's house, surrounding to the station the following features was observed: The site is surrounded by Khairagura OCP mine and coal transportation road a North, followed by Forest area at South, East & West direction Quarry activities are observed at East. The site area mainly lies in buffer zone
(5)	Sampling Duration	:	24 hrs
(6)	Period of Monitoring	:	January 2023 - March 2023
(7)	Nature of the area	:	Buffer zone

Table 1.4
Ambient Air Quality at Goveriguda Village (BA1)

Sl. No.	Date of Sampling	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
NAAQ Standards, CPCB Dated : 18.11.2009		100	60	80	80
1.	14.01.2023	61	30.5	10.2	13.0
2.	30.01.2023	64	28.8	10.8	13.8
3.	14.02.2023	59	28.3	10.1	12.9
4.	28.02.2023	55	27.8	9.9	12.0
5.	14.03.2023	60	28.8	10.3	13.0
6.	29.03.2023	63	29.7	11.2	14.0

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Ambient Air Quality at Ullipitta Dorli Village (BA2)

1)	Project Name	:	KhairaguraOpencast Expansion Project
2)	Area	:	Bellampalli
3)	Sampling Location & Code	:	Ullipitta Dorli Village (BA2)
4)	Description of the location	:	Instrument wasinstalled at a height of 4.5 meters on the top of Sri Ramu's house, surrounding to the station the following features were observed: The site is surrounded by Dorli village in North direction, followed by thiryani road and forest area in south. Dumping yard is observed in East, Vattivagu project is observed in West. The site is mainly lies at buffer zone
5)	Sampling Duration	:	24 hrs
6)	Period of Monitoring	:	January 2023 - March 2023
7)	Nature of the area	:	Buffer zone

Table 1.5

Ambient Air Quality at Ullipitta Dorli Village (BA2)

Sl. No.	Date of Sampling	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
NAAQ Standards, CPCB Dated : 18.11.2009		100	60	80	80
1.	13.01.2023	57	27.8	9.8	12.6
2.	28.01.2023	60	27.3	9.4	12.0
3.	13.02.2023	56	27.8	8.9	11.7
4.	27.02.2023	50	25.9	8.1	11.2
5.	13.03.2023	53	26.8	9.1	12.1
6.	28.03.2023	56	27.0	9.8	12.5

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Ambient Air Quality at Pathibanda Village (BA3)

(1)	Project Name	:	KhairaguraOpencast Expansion Project
(2)	Area	:	Bellampalli
(3)	Sampling Location & Code	:	Pathibanda Village (BA3).
(4)	Description of the location	:	Instrument wasinstalled at a height of 3.5 meters on the top of Ms. Parvathi Bhai's house, surrounding to the station the following features were observed: The site is surrounded by Road connecting to Asifabad in North, Agricultural area and hills are observed in south, East & West. The site mainly lies in buffer zone.
(5)	Sampling Duration	:	24 hrs
(6)	Period of Monitoring	:	January 2023 - March 2023.
(7)	Nature of the area	:	Buffer zone

Table 1.6

Ambient Air Quality at Pathibanda Village (BA3)

Sl. No.	Date of Sampling	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
NAAQ Standards, CPCB Dated : 18.11.2009		100	60	80	80
1.	13.01.2023	54	27.0	9.5	12.9
2.	28.01.2023	57	27.8	8.8	11.7
3.	13.02.2023	50	25.9	8.2	11.1
4.	27.02.2023	47	23.1	7.9	10.5
5.	13.03.2023	51	25.0	8.4	11.2
6.	28.03.2023	49	23.1	9.0	12.4

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Ambient Air Quality at Rehabilitated Dorli Village (BA10)

(1)	Project Name	:	Khairagura Opencast Expansion Project
(2)	Area	:	Bellampalli
(3)	Sampling Location & Code	:	Rehabilitated Dorli Village (BA10)
(4)	Description of the location	:	Instrument was installed at a height of 2.5 meters on the top of Smt. B. Ambubai's house, surrounding to the station the following features were observed: The site is surrounded by Agriculture lands near Pathibanda Village in North, followed by forest area in South & West. Dorli OCP-I mine is observed in East. The site is mainly lies in buffer zone
(5)	Sampling Duration	:	24 hrs
(6)	Period of Monitoring	:	January 2023 - March 2023
(7)	Nature of the area	:	Buffer zone

Table 1.7
Ambient Air Quality at Rehabilitated Dorli Village (BA10)

Sl. No.	Date of Sampling	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
NAAQ Standards, CPCB Dated : 18.11.2009		100	60	80	80
1.	11.01.2023	52	25.9	9.0	12.7
2.	25.01.2023	55	25.0	9.6	12.2
3.	10.02.2023	49	23.8	8.5	11.9
4.	24.02.2023	45	21.8	8.3	11.0
5.	10.03.2023	49	25.4	9.3	12.0
6.	25.03.2023	46	23.5	9.7	12.9

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2.0 AMBIENT NOISE LEVELS

2.1 NOISE QUALITY MONITORING

Table 2.0 Noise Monitoring Locations

Station Code	Name of the Stations	Latitude	Longitude
Core Zone			
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"
Buffer Zone			
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"

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Table 2.1 Summary of Noise Levels

Location Code	Monitoring Stations	Standard limits of Noise		January, 1st Fortnight			January, 2nd Fortnight		
				Noise levels in dB (A)					
		Day Time	Night time	Date of Sampling	Leq Day	Leq Night	Date of Sampling	Leq Day	Leq Night
Core Zone									
CN1	KHA OCP Project Office	75	70	11.01.2023	61.2	49.6	25.01.2023	61.8	50.8
CN2	KHA OCP Weigh Bridge	75	70	11.01.2023	62.7	50.9	25.01.2023	63.1	51.2
Buffer Zone									
BN1	UllipittaDorli Village	55	45	13.01.2023	49.5	39.6	28.01.2023	49.0	38.6
BN2	Pathibanda Village	55	45	13.01.2023	48.3	37.7	28.01.2023	48.8	38.2

Location Code	Monitoring Stations	Standard limits of Noise		February, 1st Fortnight			February, 2nd Fortnight		
				Noise levels in dB (A)					
		Day time	Night time	Date of Sampling	Leq Day	Leq Night	Date of Sampling	Leq Day	Leq Night
Core Zone									
CN1	KHA OCP Project Office	75	70	10.02.2023	62.3	50.1	24.02.2023	60.8	49.5
CN2	KHA OCP Weigh Bridge	75	70	10.02.2023	63.6	51.9	24.02.2023	62.3	50.8
Buffer Zone									
BN1	UllipittaDorli Village	55	45	13.02.2023	48.9	38.1	27.02.2023	48.1	38.6
BN2	Pathibanda Village	55	45	13.02.2023	47.9	37.9	27.02.2023	47.3	37.1

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Location Code	Monitoring Stations	Standard limits of Noise		March, 1st Fortnight			March, 2nd Fortnight		
				Noise levels in dB (A)					
		Day Time	Night time	Date of Sampling	Leq Day	Leq Night	Date of Sampling	Leq Day	Leq Night
Core Zone									
CN1	KHA OCP Project Office	75	70	10.03.2023	61.3	49.0	25.03.2023	61.9	49.8
CN2	KHA OCP Weigh Bridge	75	70	10.03.2023	62.7	51.3	25.03.2023	63.2	51.8
Buffer Zone									
BN1	UllipittaDorli Village	55	45	13.03.2023	49.0	39.2	28.03.2023	49.5	39.9
BN2	Pathibanda Village	55	45	13.03.2023	48.1	38.0	28.03.2023	48.7	38.8

Note: 1. Daytime is reckoned in between 6 a.m and 10 p.m *2. Night time is reckoned in between 10 p.m and 6 a.m*

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3.0 EFFLUENTS

Table 3.1 Effluents sampling locations

Sl. No.	Sample code	Name of the Location	Latitude	Longitude
1.	EW1	Khairagura Expansion OCP Mine Discharge	N 19° 14' 20.8"	E 79° 16' 25.9"
2.	EW2*	Khairagura Expansion OCP OB Dump Surface Runoff-Settling Pond Outlet	N 19° 15' 21.81"	E 79° 16' 22.79"
3.	EW3	Khairagura Expansion OCP Base Workshop ETP Outlet	N 19° 14' 7.1"	E 79° 17' 2.2"
4.	EW4	Khairagura Expansion OCP CHP ETP Outlet	N 19° 14' 10.3"	E 79° 16' 57.5"
5.	EW12	Goleti Township Treated Sewage Effluent	N 19° 13' 58.371"	E 79° 23' 8.3976"

**found to be dry*

(1) Project Name : Khairagura Opencast Expansion Project
(2) Area : Bellampalli
(3) Sampling Location & Code : Khairagura Expansion OCP Mine Discharge (EW1)
(4) Nature of the Component : Effluents
(5) Period of Monitoring : January 2023 - March 2023

Table 3.2
Characteristics of Effluents – Khairagura Expansion OCP Mine Discharge (EW1)

S.No.	Date of Sampling	pH	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	IS 3025	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.	13.01.2023	7.4	25	1058	15	1.8	<1
2.	31.01.2023	7.7	18	943	19	2.8	1.0
3.	13.02.2023	7.7	15	836	12	2.0	<1
4.	28.02.2023	8.2	29	988	24	2.5	1
5.	14.03.2023	7.4	34	897	31	3.1	1.2
6.	28.03.2023	7.7	41	910	28	2.6	1

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1.	Project Name	:	Khairagura Opencast Expansion Project
2.	Area	:	Bellampalli
3.	Sampling Location & Code	:	Khairagura Expansion OCP Base Workshop ETP Outlet (EW3)
4.	Nature of the Component	:	Effluents
5.	Period of Monitoring	:	January 2023 - March 2023

Table 3.3
Characteristics of Effluents – Khairagura Expansion OCP Base Workshop ETP Outlet (EW3)

S.No.	Date of Sampling	pH	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	IS 3025	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.	13.01.2023	7.7	43	1296	39	8.6	2.2
2.	31.01.2023	7.9	37	1128	23	5.2	1.8
3.	13.02.2023	7.6	31	978	31	6.0	1.4
4.	28.02.2023	7.9	69	1271	56	14	3
5.	14.03.2023	7.7	76	1023	51	15.2	2.8
6.	28.03.2023	7.6	56	1081	63	14.2	3

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1. Project Name : Khairagura Opencast Expansion Project
2. Area : Bellampalli
3. Sampling Location & Code : Khairagura Expansion OCP CHP ETP Outlet (EW4)
4. Nature of the Component : Effluents
5. Period of Monitoring : January 2023 - March 2023

Table 3.4
Characteristics of Effluents – Khairagura Expansion OCP CHP ETP Outlet (EW4)

S.No.	Date of Sampling	pH	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	IS 3025	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.	13.01.2023	7.9	67	1107	27	5.0	1.4
2.	31.01.2023	7.6	31	1315	19	3.2	1.0
3.	13.02.2023	7.5	26	1090	24	4.4	1.2
4.	28.02.2023	8.1	41	987	28	3	1
5.	14.03.2023	8.2	33	881	23	2.6	<1
6.	28.03.2023	7.9	62	794	20	2.2	<1

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1	Project Name	:	Others
2	Area	:	Bellampalli
3	Sampling Location & Code	:	Goleti Township Treated Sewage Effluent (EW12)
4	Nature of the Component	:	Effluents
5	Period of Monitoring	:	January 2023 - March 2023

Table 3.5
Characteristics of Effluents – Goleti Township Treated Sewage Effluent (EW12)

S.No.	Date of Sampling	pH	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	IS 3025	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.	13.01.2023	7.5	92	1526	46	13.6	2.4
2.	31.01.2023	7.8	66	1248	58	22.0	2.2
3.	13.02.2023	7.4	53	1122	83	28.2	1.8
4.	28.02.2023	6.8	48	1018	48	13.0	1
5.	14.03.2023	7.8	61	1255	35	10.2	1.2
6.	28.03.2023	7.5	42	1096	32	8.6	<1

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4.0 WATER QUALITY

4.1 Selection of Sampling Locations

A total of 4 water samples i.e., 2 samples from surface and 2 samples from groundwater were collected and analyzed for various physico-chemical and bacteriological parameters.

Table 4.1 Surface Water Sampling Locations

S.No.	Sample code	Date of Sampling	Sampling Location	Latitude	Longitude
1	SW-1	24.1.2023	Vatti Vagu U/S	N 19° 14' 53.0"	E 79° 16' 03.1"
2	SW-2	24.1.2023	Vatti Vagu D/S	N 19° 17' 35.7"	E 79° 15' 23.1"

Table 4.2 Groundwater Sampling Locations

Sl. No	Sample Code	Date of sampling	Sampling Location	Latitude	Longitude
1.	GW-1	24.1.2023	Ullipitta Dorli Village	N 19° 16' 44.6"	E 79° 14' 29.6"
2.	GW-2	24.1.2023	Pathibanda Village	N 19° 17' 49.3"	E 79° 15' 02.2"

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Table 4.3 Physico-Chemical and Bacteriological Characteristics of Surface Water

Table 4.3.1 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	7.8	8.0
2	Electrical Conductivity	µmhos/cm	2510-B	-	-	-	-	2250 µmhos/cm	628	542
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	-	5.6	5.8
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	-	-	2.6	1.6
5	Total Coliforms	MPN/100mL	9221 B	50 or less	500 or less	5000 or less	-	-	170	110
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	0.14	0.08
8	SAR	-	-	-	-	-	-	Less than 26	1.19	1.29

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Table 4.3.2 Physico-Chemical Characteristics of Surface Water at Selected Locations in the Study Area

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	ºC	2550. B	25.0	25.1
4	Turbidity	NTU	2130. B	2.2	1.4
5	Total Dissolved Solids at 180º C	mg/L	2540.C	369	320
6	Total Suspended Solids at 105º C	mg/L	2540. D	21	15
7	Chemical Oxygen Demand	mg/L	5220. D	28	20
8	Chlorides as Cl^-	mg/L	4500-Cl^-.B	59	50
9	Sulphates as SO_4^{2-}	mg/L	4500-SO_4^{2-}.E	38	24
10	Fluoride as F^-	mg/L	4500-F^-.C	0.53	0.3
11	Calcium as Ca	mg/L	3500-Ca.B	44	34
12	Magnesium as Mg	mg/L	3500-Mg.B	33	26
13	Sodium as Na	mg/L	3500-Na.B	43	41
14	Potassium as K	mg/L	3500-K.B	3.6	2.6
15	Nitrites as NO_2	mg/L	4500-NO_2^-.B	0.52	0.15
16	Nitrates as NO_3	mg/L	4500-NO_3^-.B	7	1
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_6H_5OH	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	215	225
23	Fecal Coliforms	MPN/100mL	9221 E	22	23
24	Zinc as Zn	mg/L	3120. B	0.18	0.31
25	Iron as Fe	mg/L	3120. B	0.41	0.58

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S. No	Parameters	Unit	Test Method	SW-1 Vatti Vagu U/S	SW-2 Vatti Vagu D/S
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

Table 4.4 Physico-Chemical, Bacteriological Characteristics of Groundwater Collected within the Study Area
Table 4.4.1 Organoleptic and Physical Parameters

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 Pathibanda 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	7.0	7.0
4.	Taste	FTN	2160. B	Agreeable	Agreeable	Agree.	Agree.
5.	Turbidity	NTU	2130. B	1	5	0.34	0.56
6.	Total Dissolved Solids at 180° C	mg/L	2540.C	500	2000	512	525

Table 4.4.2 General Parameters Concerning Substances Undesirable in Excessive Amounts

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 Pathibanda Village
1.	Calcium as Ca	mg/L	3500-Ca.B	75	200	70	76
2.	Magnesium as Mg	mg/L	3500-Mg.B	30	100	49	53
3.	Chlorides as Cl-	mg/L	4500-Cl-.B	250	1000	41	55
4.	Sulphates as SO42-	mg/L	4500-SO42- .E	200	400	68	57
5.	Fluoride as F-	mg/L	4500-F-.C	1.0	1.5	0.5	0.67
6.	Nitrates as NO3	mg/L	4500-NO3-.B	45	No relaxation	34	54
7.	Total Alkalinity as CaCO3	mg/L	2320. B	200	600	340	300
8.	Total Hardness as CaCO3	mg/L	2340. C	200	600	376	410
9.	Sulphide as H_2S	mg/L	4500-S2-F&D	0.05	No relaxation	BDL	BDL
10.	Total Ammonia-N	mg/L	IS 3025 (Part 34)	0.5	No relaxation	BDL	BDL
11.	Phenolic compounds as C6H5OH	mg/L	5530-D	0.001	0.002	BDL	BDL
12.	Residual free chlorine	mg/L	4500-Cl-.B	0.2	1.0	BDL	BDL
13.	Mineral oil	mg/L	IS:3025 (part 39)	0.5	No relaxation	absent	absent
14.	Anionic Detergents (as MBAS)	mg/L	IS:13428:2005K	0.2	1.0	<0.2	<0.2
15.	Aluminium as Al	mg/L	3120-B	0.03	0.2	0.06	BDL
16.	Barium as Ba	mg/L	3120. B	0.7	No relaxation	0.28	0.35
17.	Boron as B	mg/L	3120-B	0.5	2.4	0.14	0.20
18.	Iron as Fe	mg/L	3120-B	1.0	No relaxation	0.56	0.45
19.	Zinc as Zn	mg/L	3120-B	5	15	0.23	0.19
20.	Copper as Cu	mg/L	3120-B	0.05	1.5	BDL	BDL
21.	Manganese as Mn	mg/L	3120-B	0.1	0.3	BDL	BDL
22.	Selenium as Se	mg/L	3120-B	0.01	No relaxation	BDL	BDL
23.	Silver as Ag	mg/L	3120. B	0.1	No relaxation	BDL	BDL

Table 4.4.3 Parameters Concerning Toxic Substances

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 Pathibanda Village
1	Cadmium as Cd	mg/L	3120-B	0.003	No relaxation	BDL	BDL
2	Cyanide as CN-	mg/L	4500-CN-.F	0.05	No relaxation	BDL	BDL
3	Lead as Pb	mg/L	3120-B	0.01	No relaxation	BDL	BDL
4	Molybdenum as Mo	mg/L	3120. B	0.07	No relaxation	BDL	BDL
5	Nickel as Ni	mg/L	3120-B	0.02	No relaxation	BDL	BDL
6	Total Arsenic as As	mg/L	3120-B	0.01	0.05	BDL	BDL
7	Total Chromium as Cr	mg/L	3120-B	0.05	No relaxation	BDL	BDL
8	Mercury as Hg	µg/L	3500-Hg.B	0.001	No relaxation	BDL	BDL
9	**Pesticides:** α--BHC, β-BHC, γ-BHC, δ-BHC, o, p-DDT, p, p' –DDT, Endosulfan, β- Endosulfan, Aldrin, Dieldrin	µg/L	6630. D	Absent	0.001	ND	ND
	2,4-D, Carboryl (Carbonate) Malathion Methyl Parathion Anilophos, Chloropyriphos	Qualitative analysis	6630. D	Absent	0.001	ND	ND
10	**Polyaromatic Hydrocarbons (PAH's):** Acenaphthene, Acenaphthylene, Anthracene, B(a)A, B(a)P, B(b)F, B(k)F, Pyrene, Dibenz (a,h) anthracene, Fluoranthene, Fluorene, Indeno (1,2,3-(d) Pyrene, Naphthalene, Phenanthrene, Pyrene, Methyl Naphthalene	µg/L	6440.C	-	-	ND	ND

Table 4.4.4 Bacteriological Quality of Drinking Water

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 Pathibanda Village
1	Total Coliforms	MPN/100 mL	9221B	-	-	<1.8	<1.8
2	Fecal Coliforms	MPN/100 mL	9221 E	-	-	<1.8	<1.8

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4.2 Summary of Water Quality

4.2.1 Surface Water Quality

Comparison with CPCB Water Quality Criteria

The major findings are as follows: pH values were found to be 7.8 & 8.0 for SW-1, SW-2 samples. Total coliforms and fecal coliforms were present in both the surface water samples collected in the study area. Presence of total coliforms, fecal coliforms shows contamination from fecal matter or sewage entry and not suitable for direct drinking purpose and needs chlorination before treatment.

In accordance with CPCB water quality criteria, parameters studied were pH, DO, BOD and total coliforms. It may be observed that both the surface water samples have DO values ranging 5.6 & 5.8 mg/L and BOD was found to be 2.6 & 1.6mg/L in SW-1 & SW-2. Total coliforms are recorded as 170 & 110 MPN/100ml and fecal coliforms are recorded as 22 & 23 MPN/100ml in the given samples.

Both the surface water samples, Vatti Vagu U/S SW-1, Vatti Vagu D/S SW-2 fall under the CPCB water quality criteria Class–B (Outdoor bathing (Organized) as the DO is satisfactory and above 5mg/L and BOD is within the limit and Total coliforms are less than 500 MPN/100 ml.

In addition to the CPCB criteria parameters, another 32 parameters were also investigated and there are no abnormalities observed in both samples.

4.2.2 Groundwater Quality

The analytical reports show pH values range 7.0 in both GW-1 & GW-2 samples collected within the study area. Some water samples are exceeding the acceptable limits of IS: 10500:2012 but within the permissible limits. Because of underground strata, the parameters might have exceeded.

TDS concentrations were observed to be above the acceptable limit of 500mg/L but within the permissible limit of 2000mg/L at both locations, GW-1, 2 (512, 525mg/L). Magnesium concentrations were observed to be above the acceptable limit of 30mg/L but within the permissible limit of 100mg/L at both locations, GW-1, 2 (49, 53mg/L). Calcium concentration is observed to be slightly above the acceptable limit of 75mg/L but within the permissible limit of 200mg/L at GW-2 (76mg/L) and within the limit in other sample. Nitrates concentration is observed to be above the permissible limit of 45mg/L at Pathibanda GW-2 (54mg/L) and within the limit in other sample. Chlorides, Fluoride, Sulphates, Iron concentrations were below the acceptable limit at both locations.

The total alkalinity (340, 300mg/L) & total hardness (376, 410mg/L) concentrations are above the acceptable limit of 200mg/L but permissible limit of 600mg/L in both samples GW-1, 2.

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Groundwater quality at Ullipitta Dorli Village (GW-1):

In this location, all the parameters are well within the limits. So, the groundwater may be used for drinking purpose in the absence of any alternative drinking water source as few parameters exceeded the acceptable limits; however, they are well within in the permissible limits. Groundwater at this location possesses temporary hardness due to the presence of bicarbonates of calcium and magnesium which can be removed by boiling water.

Groundwater quality at Pathibanda village (GW-2):

In this location, all the parameters are well within the limits except Nitrates. Excess nitrate concentrations may be due to the fertilizers runoff from the agricultural areas, as well as the untreated disposal of domestic and industrial wastewater into the environments. Treatment of such water includes anionic ion exchange, reverse osmosis, distillation and/or deionization.

The graphical presentation for Nitrates exceeding the permissible limits is shown in Fig 4.1.

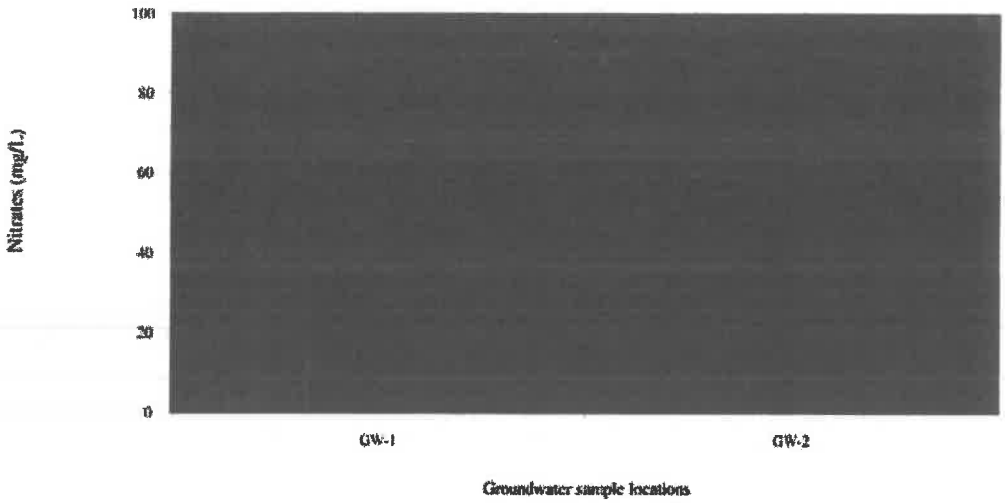

Fig:4.1 Graphical presentation of Nitrates Concentrations

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BEFORE THE HON'BLE
NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE BENCH,
AT: CHENNAI

O.A.No.39 OF 2022

IN THE MATTER OF:

Gedam Dilip Kumar

....Applicant

And

The Singareni Collieries Company Ltd

...Respondents

OBJECTIONS ON BEHALF OF RESPONDENT NO.1 & 9 [THE SINGARENI COLLIERIES COMPANY LIMITED (SCCL)]

Filed on: 13.04.2023

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