

**SIX MONTHLY REPORT
OF**

**EMP CLEARANCE
[J-11015/49/2009-IA.II(M)]**

for the period April' 23 – September'23
(1st December 2023)





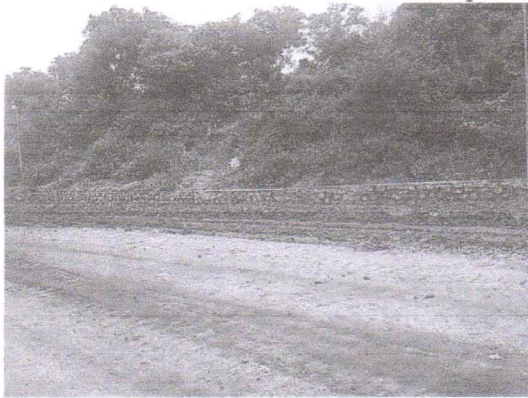
**DAKRA OPENCAST PROJECT
N K AREA**

CENTRAL COALFIELDS LIMITED
(A Miniratna Company)


Status of compliance of the terms and conditions given in the Environmental clearance letter No.J-11015/49/2009- IA. II(M) dt. 03.05.2012 issued by MOEF, Govt. of India New Delhi for Dakra Opencast Coal Mine Project (0.55 MTPA normative and 0.63 MTPA peak in an ML area of 249.72 ha.) for the period April-23 to September-23

S.No.	Condition	Compliance																														
(i)	The peak production of Dakra OCP shall not exceed 0.63 MTPA without prior environmental clearance.	<p>This directive is being strictly followed. The Coal and OB production for last five financial years is as follows:</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Coal (MT)</th> <th>OB (mCum)</th> </tr> </thead> <tbody> <tr> <td>2015-16</td> <td>0.470</td> <td>0.989</td> </tr> <tr> <td>2016-17</td> <td>0.451</td> <td>0.697</td> </tr> <tr> <td>2017-18</td> <td>0.375</td> <td>0.765</td> </tr> <tr> <td>2018-19</td> <td>0.404</td> <td>0.69</td> </tr> <tr> <td>2019-20</td> <td>0.507</td> <td>0.619</td> </tr> <tr> <td>2020-21</td> <td>0.568</td> <td>0.642</td> </tr> <tr> <td>2021-22</td> <td>0.492</td> <td>0.551</td> </tr> <tr> <td>2022- 23</td> <td>0.477</td> <td>0.524</td> </tr> <tr> <td>2023 to 30.09.2023</td> <td>0.211</td> <td>0.190</td> </tr> </tbody> </table>	Year	Coal (MT)	OB (mCum)	2015-16	0.470	0.989	2016-17	0.451	0.697	2017-18	0.375	0.765	2018-19	0.404	0.69	2019-20	0.507	0.619	2020-21	0.568	0.642	2021-22	0.492	0.551	2022- 23	0.477	0.524	2023 to 30.09.2023	0.211	0.190
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(ii)	Mining shall be carried out as per statute from Sonadoba Nala and other streams/ nalas flowing near /within the lease and maintaining a safe distance. A minimum 100 m distance shall be maintained between the quarry and Sonadoba Nala. It shall be insured that no solid wastes enter the nalas.	Mining is being carried out more than 100 m. away from the Sonadoba Nala and no solid wastes enter the Nala.																														
(iii)	No washery shall be established within the ML without prior environmental clearance from this Ministry.	There is no washery within the ML																														
(iv)	Topsoil to be generated during the balance life of the Dakra OCP shall be stacked properly with proper slope at earmarked site(s) and shall not kept active and shall be used within a year of its generation for reclamation and development of green belt.	The top soil, if so, extracted is stored at earmarked site and is subsequently used in reclamation and development of green belt. However the mine is currently in end phase and no new top soil has been generated in last 3 years																														
(v)	Of the estimated OB of 30.252Mm ³ to be generated over the balance of the mine, an estimated 19 Mm ³ of shall be rehandled in to the decoaled void, to reduce the height of the external OB dump by about	This directive would be followed strictly at end of active mining life and compliance status shall be submitted to the ministry of Environment & Forests and regional office located at Bhubaneswar on yearly basis.																														

	<p>40m from 73m to 43m. In addition, the 34.28 ha` of the total area of 65.56 ha area for ext. OB dumps, which has been already reclaimed in the existing project, shall be established with plantation using native species. Monitoring and management of reclaimed dumpsites (existing and new) shall continue until the vegetation becomes self- sustaining. Compliance status shall be submitted to the ministry of Environment & Forests and regional office located at Bhubaneswar on yearly basis.</p>	
(vi)	<p>Catch drains and siltation ponds of appropriate size shall constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected shall be utilized for watering the mine area, roads, green belt development, etc. The drains shall be regularly desilted and maintained properly.</p>	<p>The OB dumb has stabilized and there is plantation over it, causing there is no sediment flows from soil, OB and minerals dumps Also catch drains have been developed in mine area which is connected to sedimentation pond. The water from these ponds is used for water sprinkling in mines and nearby area</p>  <p>Catch drain near Dakra Siding</p>  <p>Sedimentation pond of Dakra OCP</p>
(vii)	<p>Garland drains (size, gradient and length) and sump capacity shall be designed keeping 50% safety</p>	<p>Garland drains of adequate dimension are being maintained keeping 50% safety margin over and above the peak sudden rainfall.</p>

	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.	Mine Sump of about 40,000 m ³ capacity has been developed in the mine
(viii)	Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and situation shall be based on the rain fall data.	Most of the OB dump is internal in nature. Toe walls (135 m in length) have been constructed in the mine to check run-off at critical points. 
(ix)	Mineral transportation of 1910 TPD of coal by road from mine to Dakra Railway Siding located at a distance of 1 km from the mine shall use trucks of minimum capacity of 20 T. All internal roads and approach roads, road towards Railway Siding and roads for colony shall be black topped. A 3-tier green belt shall be developed on both sides of these roads. Green belt shall be developed at the railway siding also.	Transportation of coal from mine to Dakra Railway Siding is done by 20T capacity Hywa. All internal roads and approach roads, road towards Railway Siding and roads for colony are partially RCC, WBM and finally black topped is already been exist. The green belt is already been exist in & around the roads of mine and colony. The action is being taken to develop green belt around the Rly. Siding. In monsoon 2017, about 800 plants have been planted in and around the siding Photographs as shown in Annexure A
(x)	The environment of the area in and around Dakra Railway siding shall be improved by construction of a slope with retaining wall made of concrete /cement and with stone pitching. The Railway siding shall be provides with adequate storage facility for coal and also with both fixed and mobile sprinkling arrangement. The area in and around the railway siding and along the main road for mineral transportation shall be well maintained.	The Dakra manual siding is contracted with Warf wall of RCC made & having sufficient space for storage of coal. Dust suppression is being done by mobile sprinklers. 3.2 km of PWD road along with both side drains have been completed at a cost of Rs 9.35 Cr. The drains are regularly cleaned contractually. Construction of metal road from Rohini coal stack yard to Mohan Nagar Junction for a length of 4.79 km with an expenditure of Rs 20.34 Cr has been completed. Photographs as shown in Annexure A
(xi)	High efficiency water sprinkling	Water sprinkling by mobile tankers (Hired 12 KL

	system shall be provided to check fugitive emissions at the transfer points, haulage roads, Jarangdih Railway Siding and CHP for crushing/loading operations for dust control.	and Departmental 28 KL) is continuously being carried out in the siding and connecting roads. Installation of 52 no fixed sprinkler system at Dakra siding has been completed. Water sprinkling system at feeder breaker has also been completed Permanent Wind breaking screen with retention wall has been constructed in the project Photographs as shown in Annexure A																					
(xii)	Drills shall be wet operated only.	All drills are equipped with wet drilling arrangements & working satisfactorily.																					
(xiii)	Controlled blasting shall be practiced with use of delay detonators. The mitigative measures for control of ground vibrations and to arrest the fly rocks and boulders shall be implemented.	Control blasting is being done regularly as per DGMS guidelines																					
(xiv)	A Mine Closure Plan shall be implemented and at the post-mining stage, of the quarry area of 121.38 Ha, an area of 78.06 Ha is to be backfilled up to ground level and stabilized and reclaimed with plantation and leaving a void of 43.32 Ha of 26m depth, of which the top 20m is to be gently sloped and stabilized with plantation.	Scheme for Mine Closure has been approved and its implementation will be started as per schedule. An amount of Rs 1827.28 lakh lakh has been submitted in escrow account till 31.03. 2022 An amount of Rs 810.14 lakh has been refunded from escrow account (annexure B) This condition will be fully complied at the end of mine life																					
(xv)	Progressive Mine Closure Plan shall be implemented and the total area brought under plantation shall be not less than 78.06 Ha of backfilled area, 65,56 Ha area for ext. OB dumps, 14.5 Ha is for green belt, 3.16 Ha for embankment an 17.01 Ha is for safety zone and other vacant area in and around infrastructure & buildings, railways siding, etc by planting native species from about the mix of species found in the original ecosystem in the natural forests in the study area, in consultation with the local DFO/Agriculture Department/suitable Institution. The density of the trees shall be around 2500 plants per Ha.	This directive is continuously followed in collaboration with Forest Department, Government of Jharkhand. Plantation in total area of about 99 ha has been completed in the mine. The details of plantation is as follows: <table border="1" data-bbox="842 1487 1362 1928"> <thead> <tr> <th>Year</th> <th>Plantation area</th> <th>Saplings</th> </tr> </thead> <tbody> <tr> <td>1992-93</td> <td>45.04</td> <td>112600</td> </tr> <tr> <td>1994-95</td> <td>46</td> <td>115000</td> </tr> <tr> <td>2004-05</td> <td>8.8</td> <td>22000</td> </tr> <tr> <td>2016-17</td> <td>2.50 km along siding</td> <td>1200</td> </tr> <tr> <td>2017-18</td> <td>2.00 km road side</td> <td>800</td> </tr> <tr> <td></td> <td>99.84+4.5 km</td> <td>251600</td> </tr> </tbody> </table>	Year	Plantation area	Saplings	1992-93	45.04	112600	1994-95	46	115000	2004-05	8.8	22000	2016-17	2.50 km along siding	1200	2017-18	2.00 km road side	800		99.84+4.5 km	251600
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(xvi)	No groundwater (bore well) shall be use for the project. Rainwater	No groundwater (bore well) is used in dakra project The Rainwater harvesting is being done by																					

	<p>harvesting structures including check dams for recharge of ground water shall be erected within and around the ML in case the water tables shows a declining trend. Additional water if any required during mining operations shall be met from mine sump water or from rainwater.</p>	<p>providing check dams in Dhoopgarha Nala for recharge of ground water. Further roof top rain water harvesting has been developed in project officer building</p>
(xvii)	<p>Regular monitoring of groundwater level and quality shall be carried out by establishing a network of existing wells and construction of new peizometers. 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 and to the Central pollution Control Board quarterly within one month of monitoring.</p>	<p>Regular monitoring of the underground water level is being carried out by a network of existing wells.</p>
(xviii)	<p>The project authorities shall meet water requirement of nearly village(s) in case the village wells go dry due to dewatering of mine.</p>	<p>The project supply water to nearby Mohannagar pond, which is used by the nearly villagers. Also drinking water is supplied to the villagers from the DwTP of NK Area</p> 
(xix)	<p>ETP shall be provided for workshop wastewater. Treated wastewater meeting prescribed norms only shall be permitted to be discharged in to the natural water courses.</p>	<p>Oil & Grease trap is there in the workshop . However the O&G trap is under renovation and in the meanwhile the HEMM are sent to sister mine for washings</p>
(xx)	<p>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 third party health</p>	<p>No cases of occupational diseases and hearing impairment are detected so far and third party health check up for occupational diseases and hearing impairment shall be done. Health checkup is done by Central hospital Dakra PME for all the work force at regular intervals are</p>

	<p>check up for occupational diseases and hearing impairment, if any, through an a medical institution/hospitals in the district/state.</p>	<p>being done at central hospital Dakra. In the year 2022, PME of 743 employees of NK Area had been done in calendar year 2022.</p> <p>Details of PME/ IME of last five years enclosed as annexure A</p>														
(xxi)	<p>A provision of Rs. 5/tonne of coal shall be earmarked for CSR for life of the project. The details of expenditure and various activities which includes provision/augmenting facilities for water supply, education and health shall be from part of the CSR. The status of implementation shall from a part of the Annual Report of the company and shall also be uploaded on the company website and updated at least once a year.</p>	<p>A detailed yearly CSR plan is prepared for and in consultation with the local communities by CCL management. CSR scheme has been implemented. An amount of Rs 147.8 lakh has been spent on different CSR activities by NK Area for the year 2022-23</p> <p>The CSR activities are approved by CCL CSR committee with consultation of local communities The details of CSR activities is as follows:</p> <table border="1" data-bbox="853 761 1212 1153"> <thead> <tr> <th data-bbox="853 761 1013 840">Year</th> <th data-bbox="1013 761 1212 840">Total Expenditure (In lakhs)</th> </tr> </thead> <tbody> <tr> <td data-bbox="853 840 1013 929">2017-18</td> <td data-bbox="1013 840 1212 929">51.0</td> </tr> <tr> <td data-bbox="853 929 1013 974">2018-19</td> <td data-bbox="1013 929 1212 974">58.5</td> </tr> <tr> <td data-bbox="853 974 1013 1019">2019-20</td> <td data-bbox="1013 974 1212 1019">30.6</td> </tr> <tr> <td data-bbox="853 1019 1013 1064">2020-21</td> <td data-bbox="1013 1019 1212 1064">49.4</td> </tr> <tr> <td data-bbox="853 1064 1013 1108">2021-22</td> <td data-bbox="1013 1064 1212 1108">68.4</td> </tr> <tr> <td data-bbox="853 1108 1013 1153">2022-23</td> <td data-bbox="1013 1108 1212 1153">147.8</td> </tr> </tbody> </table> <p>The main activities of CSR program of NK A ea are as follows:</p> <ul data-bbox="885 1265 1524 2027" style="list-style-type: none"> • Health camps conducted at area level • CCL Laal and Laadli – meritorious students are selected and given 2 years of education, fooding & lodging, coaching for engineering preparation after 10th standard free of cost. Many students have become engineers or chosen other successful career path since inception. One such student qualified and is working at NK area as an officer • CCL Covid crisis scholarship- students who lost their parents during covid are being provided scholarships to study. 4 are from NK Area • Children have been selected and trained at JSSPS khelgaon Ranchi, along with free education , fooding and lodging and monthly stipend. Sports cadets from JSSPS 	Year	Total Expenditure (In lakhs)	2017-18	51.0	2018-19	58.5	2019-20	30.6	2020-21	49.4	2021-22	68.4	2022-23	147.8
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		<p>have won more than 100 medals at state, national and international level</p> <ul style="list-style-type: none"> • HMV training with license have been provided to youths. 10 from NK area • ITI at BTTI Bhurkunda • Diploma programme from CIPET Ranchi • Machine operating training at Jharkhand tool room has started • Dairy and fishery training has been conducted at NK Area • Consensus with BAU and ICAR ranchi to start farming training for beneficiaries
(xxii)	<p>For monitoring land use pattern and for post mining land use, a time series of land use maps, based on satellite imagery (on a scale of 1: 5000) of the core zone and buffer zone, from the start of the project until end of mine life shall be prepared once in 3years (for any one particular season which is consistent in the time series), and the report submitted to MOEF and its Regional office at Bhubaneswar.</p>	<p>The land use pattern map is prepared by CMPDIL, Ranchi and the same is timely submitted to MOEF</p> <p>The report is given in annexure C</p>
(xxiii)	<p>A detailed Final Mine Closure Plan along with details of Corpus Fund shall be implemented for Dakra OCP after completion of project and a Plan for Final Mine Closure shall be prepared and submitted to this ministry 5 years before its completion.</p>	<p>The action shall be taken for preparation of final mine closer plan with provision of Corpus Fund. An amount of Rs 1827.28 lakh lakh has been submitted in escrow account till 31.03. 2022 An amount of Rs 810.14 lakh has been refunded from escrow account (annexure B)</p>
(xxiv)	<p>Corporate Environment Responsibility:</p> <p>(a) The Company shall have a well laid down Environment policy approved by the Board of Directors.</p> <p>(b) The Environment Policy shall prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.</p> <p>(c) The hierarchical system or</p>	<p>The company has well laid environmental policy (Annexure D)</p>

	<p>Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions shall be furnished.</p> <p>(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.</p>	
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B. GENERAL CONDITIONS

S.No.	Condition	Status
(i)	No change in technology and scope of working shall be made without prior approval of the Ministry of Environment and Forests.	No change in technology or scope of working is being done. Mining is done by shovel –dumper combination
(ii)	No change in the calendar plan including quantum of mineral coal and waste being produced shall be made.	Strictly followed.
(iii)	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for monitoring PM ₁₀ , PM _{2.5} , SO _x and NO _x . Location of the stations shall be decided sensitive targets in consultation with the State Pollution Control Board. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, in particulars shall be carried out at least once in six months.	Four ambient air quality monitoring stations at PO Office, Mohan nagar Colony, Nehru stadium and workshop have been established.
(iv)	Data on ambient air quality (PM ₁₀ , PM _{2.5} , SO _x , and NO _x and heavy metals such as Hg, As, Ni, Cd, Cr, etc) and other monitoring data shall be regularly submitted to the Ministry including its Regional office at Bhubhaneswar and to the Stat Pollution Control Board and the Central pollution Control Board once in six months. Random verification	Data on ambient air quality is being regularly submitted to the Ministry including its Regional office at Ranchi and to the State Pollution Control Board

	stipulated EC conditions shall also be uploaded by the project authorities on their website and updated at least once every six months so as to bring the same in the public domain. The monitoring data of environmental quality parameters (Air, water, noise and soil) and critical pollutants such as PM ₁₀ , PM _{2.5} , SO ₂ and NO _x (Ambient) critical sectoral parameters shall also be displayed at the entrance of the project premises and mines office and in corporate office and on the company's website.	hp)
(xvi)	The project proponent shall submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions (both in hard copy and in e-mail) to the respective Regional Office of the MOEF, the respective Zonal offices of CPCB and the SPCB.	It is being complied regularly.
(xvii)	The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The Project authorities shall expand full cooperation to the office(s) of the Regional Office by furnishing the requisite data/information/monitoring reports.	Agreed.
(xviii)	The environmental 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. The proponent shall ensure to undertake and provide for the costs incurred for taking up remedial measures in case of soil contamination, contamination of groundwater and surface water, and occupational and other diseases due to the mining operations.	Agreed.
3.	The Ministry or any other competent authority may stipulate any further condition for environmental	No additional condition has been imposed.

Annexure A Photographs


a) Water sprinkler system with plantation (May 2023)





b) Water sprinkler system with plantation (August 2020)



	protection.	
4.	Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract the provisions of the Environment (Protection) Act, 1986.	Agreed.
5.	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. The proponent shall ensure to undertake and provide for the costs incurred for taking up remedial measures in case of soil contamination, contamination of groundwater and surface water, and occupational and other diseases due to the mining operations.	Agreed.


 Nodal Officer (Env't)
 NK Area


 Environmental Officer/ IC
 Dakra OCP
 NK Area


 Project Officer
 Dakra OCP
 NK Area

Annexure A Photographs

a) Water sprinkler system with plantation (May 2023)



b) Water sprinkler system with plantation (August 2020)



c) Water sprinkler system with plantation (July 2019)



d) Water sprinkler system with plantation (July 2018)



e) Water sprinkler system with plantation (August 2016)





Figure 1.2 High Capacity Fixed water sprinklers on both sides of railway track

a) Covered Feeder Crusher with additional water sprinkling system (July 2019)



b) Covered Feeder Crusher with water sprinkling system (August 2018)



c) Feeder Crusher with water sprinkling system (August 2016)



Figure1.3feeder crusher at Dakra Siding



Figure 1.4 28 KL Mobile Sprinkler Mobile water sprinkler at Dakra siding



Figure 1.5 Plantation at Dakra Siding



Figure 1.6 3.2 Km approach road



Figure 1.7 Toe wall constructed in Dakra OCP



Figure 1.8 Wind breaking Screen with retention walls at Dakra Siding



Figure 1.9 Sedimentation Pond at Dakra Siding



Figure 1.10 Drains in Dakra Siding



Figure 1.11 Drains in Dakra Mine



Figure 1.12 approach road to Dakra Siding

CSR activities in NK Area

NK Area carries out CSR activities in 14 different panchayats of Khalari and Tandwa circle. Some of CSR activities are as follows:

Drinking Water

3 Deep borings, 9 wells, 6 handpumps, 3 water purifiers at Khalari & Mcluskieganj railway station and khalari block



Quarantine library



Graameen Football



शेखर, प्रकाश एंडरिक्सन में सार्वजनिक वार्ता कार्यक्रम का आयोजन, जिला की महिला खिलाड़ियों को उपलब्ध करायेंगे बेहतर कोच

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जिला खेल विकास बोर्ड के अध्यक्ष जे.के. शर्मा ने बताया कि कार्यक्रम में सार्वजनिक वार्ता का आयोजन किया गया था, जिसमें खेल विकास बोर्ड के अध्यक्ष जे.के. शर्मा, जिला खेल विकास बोर्ड के सदस्य और खिलाड़ियों के प्रतिनिधि शामिल थे।

शेखर, प्रकाश एंडरिक्सन में सार्वजनिक वार्ता कार्यक्रम का आयोजन, जिला की महिला खिलाड़ियों को उपलब्ध करायेंगे बेहतर कोच

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बालिका वर्ग में गणेश स्पोर्टिंग क्लब राय त बालक वर्ग में विश्रामपुर की टीम विजयी

बालिका वर्ग में गणेश स्पोर्टिंग क्लब राय त बालक वर्ग में विश्रामपुर की टीम विजयी

जिला स्पोर्टिंग क्लब राय त बालक वर्ग में विश्रामपुर की टीम विजयी

जिला स्पोर्टिंग क्लब राय त बालक वर्ग में विश्रामपुर की टीम विजयी

जिला स्पोर्टिंग क्लब राय त बालक वर्ग में विश्रामपुर की टीम विजयी

जिला स्पोर्टिंग क्लब राय त बालक वर्ग में विश्रामपुर की टीम विजयी



Distribution of sports items



Swachhta Hi Sewa 2019

1000 cloth bag distribution, social message and branding with help of 3000 pamphlets depicting restriction on use of single use plastic at houses, shops and public places in NK Area



Tricycles for physically challenged

39 tricycles for physically challenged



Village/School health Camps

Total -175 Camps





Community hall constructed under CSR scheme of NK Area



Installation of Hand pipes



Construction of well at Mcluskiganj





Construction of road and bridge near Purnadih village

सन्दूर कोलफिल्ड्स लिमिटेड
कोलफिल्ड्स लिमिटेड की एक सहायक कम्पनी)

C.C.L.

Website: <http://cclmpdi.co.in>
Office of the Colliery Manager
K.D.Hesalong Project
P.O. KDH, Dist. Ranchi, (Jharkhand)
Email ID: projectofficedakra@yahoo.com

Ref: PO/~~BM~~/O.O/19-20/ 119

DATED: 15.12.2019

OFFICE ORDER

As per the directive of CCL HQ, Ranchi a Pit Environmental Committee in respect of DAKRA OCP Project is hereby constituted consisting of following officials.

1. Project officer, DAKRA Project/ Chairman of the PEC
2. Colliery Manager, DAKRA OCP
3. Project Engineer (Excv), DAKRA
4. Project Engineer (E&M), DAKRA
5. Project Engineer (Civil), DAKRA
6. Unit Nodal Officer, (E&F), DAKRAOCP
7. Safety officer, DAKRAOCP
8. Sr. Surveyor (M) DAKRAOCP

Special Invitees:

1. Staff Officer (P&P), NLK Area
2. Area Nodal Officer (Evt. & Forest), NK Area

The above committee will meet every Friday at the Office of the Project Officer DAKRAOCP at 4.30 PM to discuss compliances of various statutory provisions related to environment such as EC, FC, CTO hazardous waste and other issues.

This issues with the consent of competent authority.


Project Officer
DAKRA Project

Copy to"

1. The General Manager, NK
2. HOD, (E&F), CCL, Ranchi

Distribution:

1. All Committee members
2. All Special Invitees

CENTRAL COALFIELDS LIMITED
DARBHANGA HOUSE: RANCHI

**Sub: Forwarding Minutes of the 480th (No. 12 of 2019)
Meeting of the Board of Directors held on 16.11.2019.**

Extract from the final confirmed minutes of the above meeting, in respect of following item, is appended below:

Item No. 480.3(4): Proposal seeking approval of Corporate Environment Policy for Central Coalfields Limited, based on the Corporate Environment Policy (CEP) 2018 of Coal India Limited.

The Board was apprised of the subject proposal seeking approval of Corporate Environment Policy for Central Coalfields Limited, based on the Corporate Environment Policy (CEP) 2018 of Coal India Limited.

It was further apprised that based upon the observation of CAG in its Draft Performance Audit Report on "Assessment of Environmental Impact due to Mining activities and its mitigation in Coal India Limited and its subsidiaries", CIL had reviewed its Corporate Environment Policy in 2018 and the same had been approved in the 377th CIL Board Meeting held on 20th December 2018. Also, as per the directions of 2nd Apex Committee meeting dtd: 18.10.2019 presided by Additional Secretary, Ministry of Coal, the Environment Policy-2018 of CIL also needs be approved by CCL Board.

After detailed deliberations, the Board approved the subject proposal as brought out in the agenda note.

Submitted for immediate necessary action to ensure compliances of the directives of the Board. ATR, may please be submitted within 08 days, so that it can be placed before the Board at least 07 days in advance of the next Board Meeting.

HOD(E&F)

D(T/P&P)

No. CS/BM/480/2019/ 410


Company Secretary

Date: 10-12-2019



COAL INDIA LIMITED



CORPORATE ENVIRONMENT POLICY

2018

Environmental Policy Statement:

Coal India Limited(CIL) is committed to promote sustainable development by protecting the environment through integrated project planning & design, prevention / mitigation of pollution, conservation of natural resources, restoration of ecology & biodiversity, recycling/ proper disposal of wastes, addressing climate change and inclusive growth. It also aims to bringing awareness amongst its stakeholders for continual improvement in environmental performances following best practices.

OBJECTIVES:

Coal India Limited shall endeavor to:

- 1. Plan & design projects with due consideration to environmental concerns for Sustainable Development.*
- 2. Conduct mining and associated operation in an environmentally responsible manner to comply with applicable laws and other requirements related to environmental aspects.*
- 3. Prevent pollution of surrounding habitation by continuous monitoring and adopting suitable measures for environment protection.*
- 4. Implement Environment Management Plans in all our mines /projects effectively to mitigate pollution, conservation of natural resources and restoration of ecology & biodiversity.*
- 5. Ensure compliance of all applicable Environmental Clearance& Forestry Clearance conditions and other statutory conditions issued by regulatory agencies.*
- 6. Recycling of wastes on the principle of REDUCE, REUSE and RECYCLE.*
- 7. Put special thrusts on efficient energy utilization / renewable energy as a measure to reduce carbon foot-print.*
- 8. Strive for continual improvement in our environmental performances by setting targets, measuring progress and taking corrective action.*
- 9. Taking measures to render productive post mining land use.*
- 10. Implementation of activities applicable to CIL arising out of International Conventions.*
- 11. Create environmental awareness among the employees and the local communities through pro-active communication and training.*

STRATEGIES FOR IMPLEMENTATION OF ENVIRONMENTAL POLICY:

Back Ground:

Coal India Limited subscribes to the view of Sustainable Development. Unless the environment can sustain all the developmental activities, any pursuit of development in isolation can cause irreparable damage to the ecosystem and associated environmental attributes. Keeping this view in mind, Coal India Limited attaches top priority towards sustainable development and approved its 'Corporate Environmental Policy' in December 1995, which was subsequently revised in 2012. However the present policy is the amendment of the 2012 Policy and is complimentary to the National Environmental Policy, 2006.

This modification in the present policy is the outcome of the experience gained since 2012 keeping in view the modifications / amendments made time to time in environmental policies and additional stipulation notified by MoEF&CC (Ministry of Environment, Forest& Climate Change) and other organisations concerning mine closure, reclamation of degraded land, environmental clearance etc. and also with the objective of revisiting the corporate policy.

This Policy has a vision of Green Mining and mission of 100% compliance of environmental statutes applicable to coal mining industry.

Strategies: Coal India adopts the strategies appended below for effective implementation:

1. MINE/ PROJECT PLANNING & DESIGN FOR SUSTAINABLE DEVELOPMENT:

- a) Coal being a non-renewal energy source, extraction shall be planned prudently to meet national requirement in a planned way. The projects shall be designed on the principle of Sustainable Development with due consideration to environment, mine closure ,safety and aspirations of the stakeholders at the planning& design stage itself with due regard to mine closer plan.
- b) While preparing the Mining plan/project reports, the effort shall be to incorporate latest mining technologies and equipment's with optimal capacity, which are more environment friendly.

- c) All Mining Plan/ project reports will be provided with detailed provisions for ensuring environmental compliances.

2. ENVIRONMENTAL IMPACT ASSESSMENT (EIA) & ENVIRONMENT MANAGEMENT PLAN (EMP)

- a. All mine planning and design shall be environmentally acceptable and operation shall be carried out in such a way as to facilitate the compliance of stipulated environmental standards.
- b. EIA& EMP for all projects shall be formulated as per the approved ToR (Terms of Reference) and public consultations for obtaining Environmental Clearance (EC) from MoEF&CC. Similarly, in the existing projects needing enhancement of production capacities with or without increase in land, change of technology, renewal of lease and change in land use etc. fresh EC is required to be sought as per norms. The projects shall be operated after obtaining Consent to Establish (CTE)/Consent to Operate (CTO) from State Pollution Control Boards (SPCB).
- c. Detailed Mine Closure Plans shall be prepared for all existing and new mines as per the MoC (Ministry of Coal) guidelines.

3. COMPLIANCE OF THE STATUTORY REQUIREMENTS:

The implementation of EMP and fulfillment of all other statutory requirements like conditions of EC, FC and consents to establish & operate, including timely submission of returns to statutory bodies and various agencies, are to be ensured at all levels.

4. MEASURES TO MITIGATE POLLUTION:

a) Air Pollution:

- i) Generation of dust is to be controlled at the source to the possible extent with necessary control measures during drilling, blasting, loading, unloading, CHP transfer points etc.
- ii) Deployment of eco-friendly mining technologies.
- iii) Dust generation is to be minimized along coal / waste transportation routes.
- iv) Mechanized transportation of coal to be encouraged.
- v) Green belt is to be created around the source of dust.

b) Water pollution:

- i) The mine water and other effluent shall be treated to ensure the discharge norms as per statute. The treated effluent shall be utilized to the extent possible with a view to achieve maximum water conservation.
- ii) Oil & grease from the effluent shall be removed by Oil & Grease Traps for proper disposal.

c) Noise / ground vibration:

- i) All measures to minimize noise pollution will be taken including maintenance of HEMM, equipment and provision of PPE where required.
- ii) Suitable controlled blasting techniques shall be followed to reduce ground vibration as well as noise pollution.

d) Land reclamation:

- i) Progressive and concurrent reclamation of mined out areas will be carried out as per approved EIA/EMP and Mine Closure Plan (MCP).
- ii) Slopes of external dumps are the important area to be suitably graded / terraced for effective reclamation and plantation.
- iii) Preservation of top soil is required for future use. Old as well as existing non-active dumps are to be technically and biologically reclaimed.
- iv) Monitoring of reclamation work of all opencast mines will be done through Satellite Surveillance. The outcome shall be put in the websites.

e) Mine closure plans:

Mine Closure Plan (MCP) shall be prepared for each mine. MCP are being delineated in two phases viz. progressive and final mine closure. Appropriate funds are set aside and deposited under a special Escrow fund every year as per MoC guidelines, to be utilized for proper and final mine closure.

For mines closed prior to issuance of MoC guidelines (i.e. 27th August, 2009) suitable action to be taken as per provisions of Mines Act 1952.

f) Mine fire

CIL shall endeavour to reduce occurrence of mine fire and subsidence due to mining activity. Monthly report shall be submitted to top management of the subsidiary and CIL and Quarterly to company board. Action Plan for mine fire control shall be implemented. Monitoring will be done through Satellite Surveillance/other suitable technology.

g) Monitoring:

- I. All receptors in and around the mining projects shall be monitored regularly to assess the efficacy of the pollution control / mitigation measures within stipulated standards.
- II. Effect of mining on the hydrology of the area will be monitored through measurement of water level and its quality of nearby wells and bore holes provided for this purpose. Conservation of water through rainwater harvesting shall be taken up.
- III. Area and Unit environmental cells shall have regular interaction with the people in and around the coal mines and other allied units on matters related to environment to take necessary and timely corrective actions.
- V. Environmental initiatives and monitoring through self and third party environment audit shall be conducted for generating useful data for taking corrective actions and mitigation measures as per guidelines.

h) Other measures:

- I. Special emphasis shall be given to undertake R&D related to various facets of coal mine environmental management in collaboration with Central Mine Planning and Design Institute (CMPDI) and other competent institutions.
- II. Besides ensuring statutory compliance, the CIL desires to set high standards and continual improvement.
- III. A number of mines and establishments of CIL are ISO 14001 certified and balance mines & establishments shall be ISO 14001 certified in phased manner.
- IV. CSR and R&R policies of CIL are to be incorporated for better planning and implementation of the socio-economic issues of coal mining areas.
- V. The coal mining environmental issues are complex and require multi-disciplinary approach to address the same. CIL will endeavor to enter into MoUs with expert agencies of repute to assist in environment issues and also help in capacity building of CIL executives.
- VI. CIL conduct periodical medical examination (PME) of its work force on routine basis in compliance of the requirement mining rules and regulation, additional test will be done as and when require.

5. PRESERVATION OF BIO-DIVERSITY:

- a) This will start from mine planning including technically and biologically reclamation of mined out areas in collaboration with State Forest Departments, Wild Life Divisions, NGOs etc. working in the fields of bio-diversity conservation.

- b) The selection of species for plantation shall be done in consultation with the local community to include the local species and their preferences, if any.

6. COAL BENEFICIATION / COAL WASHERIES:

- a) For beneficiation of Runoff Mines (ROM) coal, washeries are being set up in a phased manner as per requirement and statutes.
- b) Slurry Management System (SMS) in all washeries shall be organized to ensure collection of fines, gainful utilization of rejects viz. power generation in Fluidized Bed Combustion (FBC) plants, selling to brick manufacturers or adopting other environmental friendly disposal options as feasible.
- c) The reject dumps and tailings shall be suitably handled to avoid any contamination.
- d) The effluent from washeries including tailings pond shall be suitably treated and reused to minimize water consumption with zero discharge concept.

7. CONSERVATION AND CLEAN TECHNOLOGY:

- a) R&D projects shall be taken up to promote clean coal technology and improve the existing technologies.
- b) Energy saved is energy produced. Voluntary energy audit to be done for corrective action to reduce carbon footprint.
- c) Clean Development Mechanisms will be explored for reducing emission of Green House Gases by exploration, identification, preparation of projects reports for extraction of methane from Coal Bed, Coal Mine, Abandoned Mine, Ventilation Air, UG Coal Gasification, generation and utilization of renewable energy etc.

8. AWARENESS PROGRAMME:

- a) Publicity to generate awareness through exchange & communication of information, newsletters and periodicals on environment, seminars, workshops, celebration of World Environment Day etc. at CIL / Subsidiary HQs, Areas & units to be undertaken. Regular training programs to be organized at various levels to inculcate awareness among employees.
- b) Courses on environmental and forestry laws and Environmental Protection Measures and the Corporate Policy to be organized for project executives for improving knowledge.
- c) CIL to give annual awards for achieving excellence in environment related

issues and activities. These awards will be in recognition for implementation of EMP, land reclamation and compliance of statutes, proper maintenance of air & water quality and noise level.

9. WASTE MANAGEMENT:

CIL will undertake appropriate action for safe handling, storage and disposal of solid waste and hazardous waste generated from its industrial set up and colonies as per relevant rules. The biomedical waste generated from hospitals and dispensaries will be collected and disposed in appropriate facilities created as per statutes. E-waste management and handling of various types of e-waste generated in its operations will be done as per rule.

10. CORPORATE ENVIRONMENT RESPONSIBILITY:

Corporate Environment Responsibility (CER) is mandatory for issuing environmental clearance for all the Greenfield and Brownfield projects as per directives of MoEFCC with effect from 1st May, 2018 (O.M.No.22-65/2017-IAIII dt. 19.06.2018). Budgetary provisions should be kept for implementation of provisions of CER for all the projects which will be submitted to MoEFCC for grant of environmental clearance.

11. INCORPORATION OF VIEWS OF STAKEHOLDERS:

CIL will critically examine and incorporate the viewpoints of various stakeholders like PAPs/PAFs, Parliamentary Committees, Standing Sub-Committees, NGOs etc. CIL being a listed entity with stock exchange, it will also take into consideration the observations/viewpoints of international investors.

12. IMPLEMENTATION OF POLICY:

- i) **Manpower:** CIL shall have environmental divisions at decision making & operational levels in its structure. The environment department shall be set up and strengthened at:
 - i) CIL Corporate HQ at Kolkata
 - ii) Subsidiary HQs
 - iii) Areas / Units / Collieries / Workshops /Washeries
 - iv) CMPDI (HQ) & CMPDI Regional Institutes
- ii) **Roles and Responsibilities:** The environmental department, set up at company HQs, Areas and Unit levels with appropriate manpower and resources, shall be responsible for implementation of policy, obtaining EC, FC, consent to establish

& operate, statutes requirements and undertaking mitigation measures besides preparation of action plan every year and also to intimate the status of implementation to the management regularly.

iii) Annual Environment Budget (Revenue & Capital): The Annual Environment Budget (revenue & capital) shall be prepared based on the action plan including monitoring of various bench marks and the budget utilization. The year wise funds earmarked for environmental protection measures shall be kept in separate accounts with Environmental cost code.

13. FLEXIBILITY TO THE SUBSIDIARY COMPANIES:

CEP 2018 will be applicable for all subsidiaries of CIL. The subsidiary company Boards have been authorized to approve necessary modifications in CEP 2018 with reference to unique conditions prevailing at the concerned subsidiary.

REVIEW OF ENVIRONMENTAL POLICY:

In view of the present fast changing social, economic and environmental scenario, this Policy shall be reviewed every 5 years to incorporate the changes in the legal, technical, environmental, economic and social inputs prevailing at that time. Whenever, there is change in National Environmental Policy or other National / State relevant policies, Acts etc, this Corporate Environmental Policy would be reviewed and suitably revised.

OFFICE OF THE COAL CONTROLLER
GOVT OF INDIA
MINISTRY OF COAL
1, COUNCIL HOUSE STREET, KOLKATA-700 001.
Ph. No. 2248 5468 Email:- coalcont-wb@nic.in

F.No.CC/MCPS/DAKRAOC/CCL/19-20/517

Date:-23.09.2019

Notice

The undersigned is directed to say that CCL vide office letter No. GM(UG/MC)/Reim.claim/2019/428 dt. 06.6.2019 had submitted Progressive Mine Closure Monitoring and Audit report of the first phase 2011-12 to 2015-16 conducted by CMPDIL, Ranchi regarding reimbursement of claims under progressive Mine closure Plan of DAKRA OCP Mine of CCL for an amount of Rs 812.74448 Lakh from Mine closure Escrow fund of DAKRA OCP of CCL as per Mine Closure Plan Guidelines dated 7.1.2013. After scrutiny of documents submitted by CCL and inspection report prepared by OSD, CCO, Ranchi, the Technical Committee of CCO (HQ), Kolkata has recommended for reimbursement of Rs. 810.14 Lakh for the said project.

Before release of fund, it is brought to the notice that if any comments/views by any stake holder of DAKRA OCP Mine arises, they are invited to submit the same to the Office of the Coal Controller within **15 days positively** from the date of issue of the said notice after which no submission will be accepted.

This issues with the approval of Coal Controller.

K-1642
23/09/2019
Officer on Special Duty (MC&P)
CCO/Kol

Vocational training Centre, NK Area

Sr. No.	Name of mine	Target						Contractual						Departmental					
		2017	2018	2019	2020	2021	2022	2017	2018	2019	2020	2021	2022	2017	2018	2019	2020	2021	2022
1	KDH	132	35	99	105	108	104	39	03	9	12			134	39	113	119	118	113
2	Dakra	64	60	65	78	73	67	17	11	10		7		81	69	82	83	90	77
3	Rohini	72	51	52	52	54	62	16	60	45	11	1		88	64	91	94	58	67
4	Purnadih	100	60	60	80	90	102	12	9	13		13		106	80	68	97	93	103
5	Churi	72	60	55	72	70	70	38	84	126	18	100	109	78	69	95	83	82	72
6	RR shop	20	20	20	15	15	12							21	20	21	21	16	14
7	GMO													01	08	22	14	18	14
		460	286	351	402	410	417	122	167	203	41	121	109	509	349	464	511	472	460

CENTRAL COALFIELDS LIMITED
(A subsidiary of Coal India Limited)

OFFICE OF THE V T MANAGER
GROUP VOCATIONAL TRAINING CENTER
NORTH KARNPURA AREA, DAKRA-829210, DIST-RANCHI (JHARKHAND)

G.V.T.C., N.K.
Dispatch No. 3403
Date: 01.01.2023

Month: -DECEMBER 2022

To,
The Project Officer,
Dakra/ KDH/ Rohini /Purnadih/ Churi/ R. R. Shop/M & A/Rajhara
Sub: - Project wise training report at GVTC, N K Area, Dakra for the month of DECEMBER 2022
Dear Sir,

Please find here with the training report at Group Vocational Training Center, N K Area, Dakra.

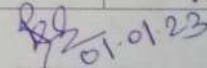
PROJECT N K	ANNUAL TARGET (REF)	TRAINING DURING THE MONTH						PROGRESSIVE					
		Departmental			Contractor			Departmental			Contractor		
		Basic	Refresher	Spl	Basic	Refresher	Spl	Basic	Refresher	Spl	Basic	Refresher	Spl
KDH	104	--	05	----	----	----	07	106	----	----	----	----	
DAKRA	67	--	15	----	----	----	10	67	----	----	----	----	
ROHINI	62	--	24	----	----	----	04	63	----	----	----	----	
PURNADIH	102	--	--	----	----	----	01	102	----	----	----	----	
CHURI	70	--	04	----	--	08	----	72	----	88	21	----	
RR Shop	12	--	03	----	----	----	02	12	----	----	----	----	
G M O	---	05	---	----	----	----	14	----	----	----	----	----	
TOTAL	417	05	51	--	--	08	--	38	422	--	88	21	--

M & S	----	09	----	----	----	----	54	----	----	----	----	----
A & C	----	03	----	----	----	----	22	----	----	----	----	----

RAJHARA	---	---	---	----	----	----	47	29	----	----	----	----
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GRAND TOTAL	417	17	51	--	--	08	--	161	451	--	88	21	--
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APPRENTICES N K	MALE	FEMALE	MONTHLY ACHIVEMENT	MALE	FEMALE	PROGRESSIVE ACHIVEMENT
I T I	06	----	06	48	----	48
PDPT	06	---	06	97	----	97
Lamp Handling	----	-----	-----	40	----	40
C S R	----	-----	-----	24	20	44


 V T Manager
 Group Vocational Training Center
 N K Area Dakra

Distribution: -

1. SO (Safety), N K Area, Dakra.
2. Area Training Officer, N K Area, Dakra.

Copy for Kind Information please: -

1. GM (HRD), CCL, Ranchi.
2. General Manager, N.K. Area, Dakra.

भारतीय डाक
India Post

CENTRAL COA
(A subsidiary of)
OFFICE OF THE
GROUP VOCATION
NORTH KARNPURA AREA, DAKR

To,
The Project Officer,
Dakra/ KDH/ Rohini /Purnadih/ Churi/ R. R. Shop

Sub:-Project wise training report at GVTC, NK Area, Dakra for the month of DECEMBER 2021.

Dear Sir,

Please find here with the training report at Group Vocational Training Center, N K Area, Dakra.

PROJECT N K	ANNUAL TARGET (REF)	TRAINING DURING THE MONTH						PROGRESSIVE					
		Departmental			Contractor			Departmental			Contractor		
		Basic	Refresher	Spl	Basic	Refresher	Spl	Basic	Refresher	Spl	Basic	Refresher	Spl
KDH	108	---	06	---	---	---	---	08	110	---	---	---	---
DAKRA	73	05	---	---	---	---	---	17	73	---	07	---	---
ROHINI	54	---	04	---	---	---	---	04	54	---	-01	---	---
PURNADIH	90	---	---	---	---	---	---	01	92	---	---	13	---
CHURI	70	02	20	---	01	04	---	06	73	03	85	15	---
RR Shop	15	---	07	---	---	---	---	01	15	---	---	---	---
G.M.O	---	03	---	---	---	---	---	18	---	---	---	---	---
TOTAL	410	10	37	---	01	04	---	55	417	03	93	28	---

M & S	---	10	---	---	---	---	---	102	---	---	---	---	---
A & C	---	03	---	---	---	---	---	19	---	---	---	---	---

RAJHARA	---	---	---	---	---	---	---	05	15	---	30	---	---
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GRAND TOTAL	410	23	37	---	01	04	---	181	432	03	123	28	---
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ITI APPRENTICES	MALE	FEMALE	MONTHLY ACHIVEMENT	MALE	FEMALE	PROGRESSIVE ACHIVEMENT
N K	---	---	---	82	---	82
CISF	---	---	---	343	---	343

31/12/2021
V T Manager
Group Vocational Training Center
NK Area Dakra

Distribution:-

1. SO (Safety & Training), N K Area, Dakra.

Copy for Kind Information please:-

1. DMS, SEZ, Ranchi Region, Ranchi
2. GM (HRD), CCL, Ranchi.
3. General Manager, N K Area, Dakra.

CENTRAL COALFIELDS LIMITED
(A subsidiary of Coal India Limited)
OFFICE OF THE V T MANAGER
GROUP VOCATIONAL TRAINING CENTER
NORTH KARNPURA AREA, DAKRA-829210, DIST-RANCHI (JHARKHAND)

Month:-DECEMBER 2020

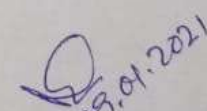
To,
The Project Officer,
Dakra/ KDH/ Rohini /Purnadih/ Churi/ R. R. Shop/M & A/Rajhara

Sub:-Project wise training report at GVTC, NK Area, Dakra for the month of DECEMBER 2020.

Dear Sir,
Please find here with the training report at Group Vocational Training Center, N K Area, Dakra.

PROJECT N K	ANNUAL TARGET (REF)	TRAINING DURING THE MONTH						PROGRESIVE					
		Departmental			Contractor			Departmental			Contractor		
		Basic	Refresher	Spl	Basic	Refresher	Spl	Basic	Refresher	Spl.	Basic	Refresher	Spl.
KDH	105	---	10	---	01	---	---	09	106	04	12	---	---
DAKRA	78	01	---	---	---	---	---	02	79	02	---	---	---
ROHINI	52	03	---	---	---	---	---	17	64	13	08	03	---
PURNADIH	80	01	02	---	---	---	---	13	82	02	---	---	---
CHURI	72	---	01	---	---	---	---	02	75	06	11	07	---
RR Shop	15	03	02	---	---	---	---	05	15	01	---	---	---
G M O	----	03	---	---	---	---	---	14	---	---	---	---	---
TOTAL	402	11	15	---	01	---	---	62	421	28	31	10	---
M & A	---	05	---	---	----	----	--	19	---	---	---	---	---
RAJHARA	---	03	03	---	---	---	---	08	21	---	---	---	---
GRAND TOTAL	---	19	18	---	01	----	---	89	442	28	31	10	---

ITI Apprentice	Monthly Achievement	M	F	Progressive Achievement	M	F
	Total =02	02	NIL	Total =09	08	01


09.01.2021
V T Manager
Group Vocational Training Center
NK Area Dakra

Distribution:-
1. SO (Safety & Training), N K Area, Dakra.

Copy for Kind Information please:-

1. GM (HRD), CCL, Ranchi.
2. General Manager, N.K. Area, Dakra

V.T.C., N.K.
Despatch No. 652
Date: 02.01.2020



**OFFICE OF THE
GROUP VOCATIONAL
TRAINING CENTER
NORTH KARNPURA AREA, DAKRA**
A Miniratna Co.

E9916859471IN INR16974916859471
SP DAKRA COLLETRY SO 3829210
Counter No:1,03/01/2020,10:10
To:THE D OF N SA, KANKE ROAD RANCHI
PIN:834008, Ranchi University S.O
From:GROUP V T G, N K AREA DAKRA
Wt:10gms
Amt:41.30(Cash)/Tax:6.30
<Track on www.indiapost.gov.in>
<Dial 1800 266 6886>

Date: **Month:-DECEMBER 2019**

To,
The Director of Mines Safety,
SEZ Ranchi, Ranchi Region,
RI-III, CMPDIL Complex, Kanke Road, Ranchi, Jharkhand, Pin-834008

Sub:-Project wise training report at GVTC, NK Area Dakra for the month of December 2019.

Dear Sir,

Please find here with the training report at Group Vocational Training Center, N K Area, Dakra.

PROJECT N K	ANNUAL TARGET (REF)	TRAINING DURING THE MONTH						PROGRESIVE					
		Departmental			Contractor			Departmental			Contractor		
		Basic	Refresher	Spl	Basic	Refresher	Spl	Basic	Refresher	Spl.	Basic	Refresher	Spl.
KDH	99	---	---	---	---	---	---	07	103	03	07	02	---
DAKRA	65	---	---	---	---	---	---	09	66	07	06	04	---
ROHINI	52	02	02	-	05	05	---	04	52	06	33	12	---
PURNADIH	60	---	01	---	---	---	---	06	60	03	05	08	---
CHURI	55	---	---	---	08	---	---	28	66	01	98	28	---
RR Shop	20	---	04	---	---	---	---	01	20	---	---	---	---
G M O	---	---	---	---	---	---	---	22	---	---	---	---	---
TOTAL	351	02	07	---	13	05	---	77	367	20	149	54	---
M & A	---	01	---	---	---	---	---	35	---	---	---	---	---
RAJHARA	---	---	07	---	---	---	---	53	24	---	16	---	---
GRAND TOTAL	---	03	14	---	13	05	---	165	391	20	165	54	---

02.01.2020

V T Manager
Group Vocational Training Center
NK Area Dakra

Distribution:-

1. SO (Safety & Training), N K Area, Dakra.
2. The Project Officer-Dakra/ KDH/ Rohini /Purnadih/ Churi/ R. R. Shop/M&A/Rajhara

Copy for Kind Information please:-

1. GM (HRD), CCL, Ranchi.
2. General Manager, N.K. Area, Dakra

CENTRAL COAL FIELDS LIMITED
OFFICE OF THE VT MANAGER
Group Vocational Training Center
N.K. Area Dakra , P.O.-Dakra, PIN-829210, Dist-Ranchi

Date: 01/11/19

To,
 The Director of Mines Safety,
 SEZ Ranchi, Ranchi Region,
 RI-III, CMPDIL Complex, Kanke Road, Ranchi, Jharkhand, PIN 834008.

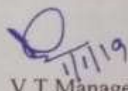
Sub:- Project wise training report at GVTC, NK Area, Dakra for the calender year 2018.

Dear Sir,

Please find with the training reports at Group Vocational Training Center NK Area Dakra

Project Name	Annual Target	Training during the month						Progressive					
		Departmental			Contractor			Departmental			Contractor		
		Basic	Refresher	Spl.	Basic	Refresher	spl	Basic	Refresher	Spl.	Basic	Refresher	Spl.
KDH	35	—	—	—	—	—	—	03	36	—	03	—	—
Dakra	60	—	—	—	06	—	—	08	61	—	07	04	—
Rohini	51	—	—	—	11	04	—	11	53	—	41	19	—
PND	60	—	07	—	—	02	—	18	62	—	02	07	—
Churi	60	—	—	02	04	—	—	02	62	05	63	21	—
RR Shop	20	—	07	—	—	—	—	—	20	—	—	—	—
Gmo	—	—	—	—	—	—	—	08	—	—	—	—	—
Total	286	—	14	02	21	06	—	50	294	05	116	51	—

M&A	—	—	—	—	—	—	—	50	—	—	—	—	—
Rajhara	—	—	10	—	—	—	—	—	10	—	—	—	—
Total	—	—	10	—	—	—	—	50	10	—	—	—	—


 V T Manager
 Group Vocational Training Center
 NK Area Dakra

Distribution:-

- SO(Safety&Training), NK,

Copy for Kind Information Please:-

- General Manager, N.K. Area Dakra

etc



COALFIELDS LIMITED
 SF DAKRA COLLIERY <829210>
 GSTH No: 20AAA090961L125
 E: 3913162718 TN
 Counter No: 1, DF-Codes P6
 To: DIRECTOR OF MINES SA, RANCHI
 RANCHI, PIN: 834008
 From: MANAGER GROUP VOCATIONAL TRAINING, NK DAKRA
 Dt: 02/01/2018 . 10:57
 Amt: 41.00
 .CBST @% 3 .SGST @% 3.00



COALFIELDS LIMITED
 (Niratna Company)
 OF THE VT MANAGER
 GROUP VOCATIONAL TRAINING CENTER
 210, DIST-RANCHI (JHARKHAND)

Month-DECEMBER 2017

R R Shop/Magadh - Amrapali/Rajhara.
 at GVTC, NK Area, Dakra.

Dear Sir,

Kindly find placed hereunder format in respect of training reports at Group Vocational Training Centre, NK Area for your kind perusal.

Project Name	Annual Target Ref)	Training during the month						Progressive					
		Departmental			Contractor			Departmental			Contractor		
		Basic	Refresher	Special	Basic	Ref.	Specil	Basic	Refresher	Special	Basic	Ref.	Special
KDH	132	---	---	----	----	----	01	133	----	28	11	----	
Dakra	64	---	---	----	----	----	15	64	02	08	09	----	
Rohini	72	---	---	----	----	03	16	72	----	13	03	----	
Purnadih	100	---	24	----	----	02	05	101	----	07	05	----	
Churi U/G	72	01	01	----	----	----	02	76	----	05	33	----	
M R S Churi	---	---	---	----	----	----	----	----	----	----	----	----	
R.R.S Dakra	20	---	02	----	----	----	01	20	----	----	----	----	
GM Unit	---	---	---	----	----	----	01	----	----	----	----	----	
Total	460	01	27	----	---	05	41	466	02	61	61	----	

M & A	----	02	----	----	----	---	----	21	----	----	----	----
Rajhara	----	----	----	----	----	---	----	14	----	----	----	----

19/1/2018
 VT Manager,

Group Vocational Training Centre
 N K, Area, Dakra

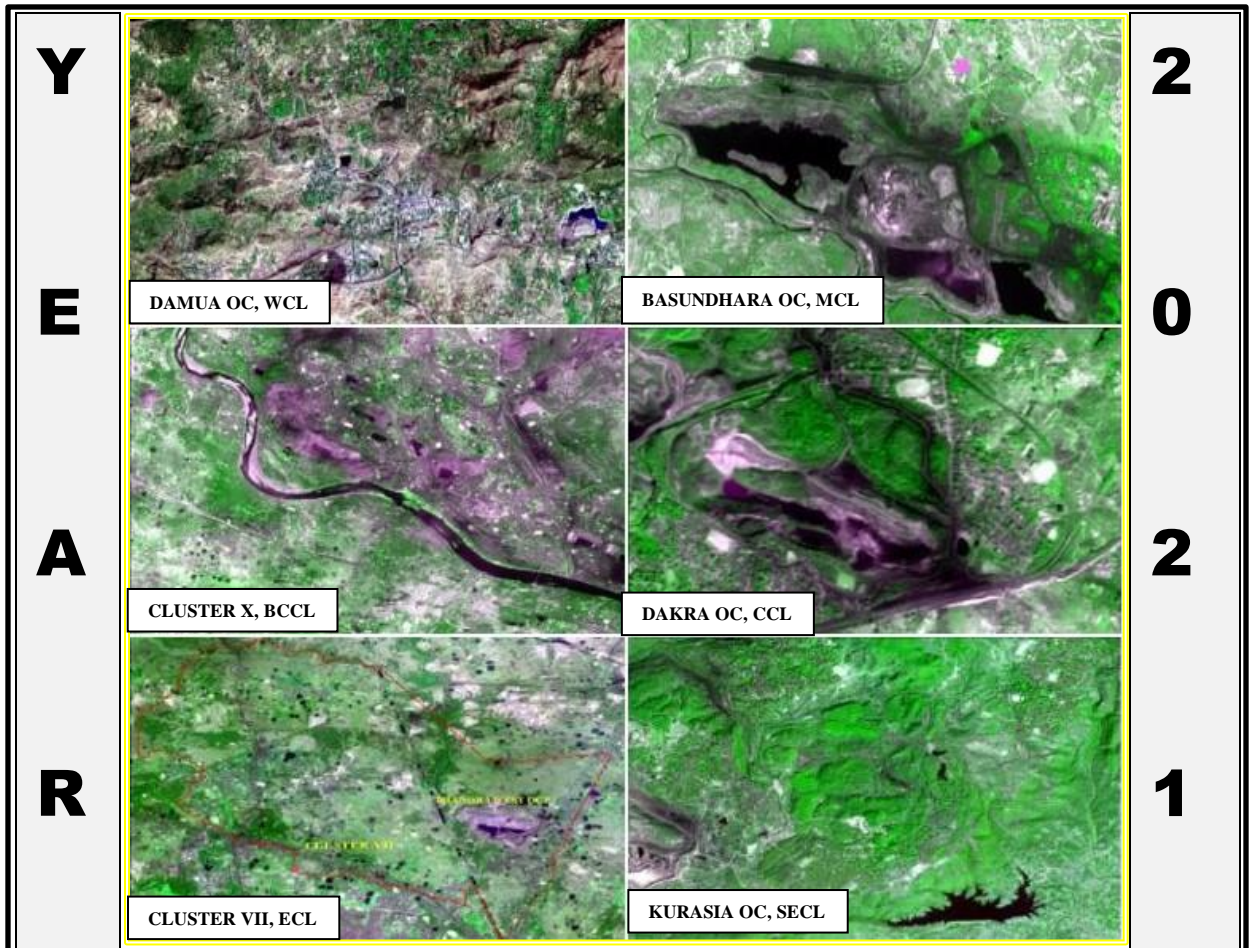
Copy to:-

1. SO (Safety)/Area Training Officer, N K Area, Dakra.

Copy for kind information:-

- 1 GM (HRD), CCL
2. General Manager, NK Area Dakra.

Land Restoration / Reclamation Monitoring of 20 Opencast Coal Mines and 09 Clusters of coal mines of CIL producing less than 5 mcm (Coal+OB) annually based on Satellite Data for the Year 2021



Submitted to
Coal India Limited



Land Restoration / Reclamation Monitoring of 20 Opencast Coal Mines and 09 Clusters of coal Mines of CIL producing less than 5 mcm (Coal+OB) annually based on Satellite Data for the Year 2021

MARCH - 2022



**Remote Sensing Cell
Geomatics Division
CMPDI, Ranchi**

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Executive Summary

1.0 Project Land restoration / reclamation monitoring of 20 opencast coal mines and 09 clusters of coal mines of different subsidiaries of Coal India Ltd. (CIL) producing less than 5 million cu.m. (Coal+OB) per year based on satellite data regularly at an interval of three years.

2.0 Objective Objective of the land restoration / reclamation monitoring is to assess the area of backfilled, plantation, social forestry, active mining area, water bodies, distribution of wasteland, agricultural land and forest in the leasehold area of the project. This will help in assessing the progressive status of mined land reclamation and to take up remedial measures, if any, required for environmental protection.

3.0 Salient Findings

- Out of the total mine leasehold area of 38079.01 Hectares of the 20 opencast projects & 09 clusters together of different subsidiaries of CIL producing less than 5 mcm (Coal +OB) annually considered for monitoring during 2021-22; total excavated area is 3609.63 hectares, out of which 550.83 hectares (15.26%) is under plantation (*Biologically Reclaimed*), 1792.63 hectares area (49.66%) is under backfilling (*Technical Reclamation*) and rest 1266.17 hectares (35.08%) area is under active mining. It is evident from the analysis that 2343.46 hectares (64.92%) area of the 20 OCPs & 09 clusters taken for monitoring for the year 2021-22 is under reclamation and balance 1266.17 hectares (35.08%) area is under active mining. Company wise details of land reclamation of the above OCPs & Clusters is given in Table-1 & Fig-1.

The projects selected for land reclamation monitoring in the year 2021-22 are subdivided into two groups viz (A) 20 opencast projects belonging to WCL, SECL, MCL & CCL and (B) 09 clusters of mines of ECL and BCCL.

- For Group A, out of the total mine leasehold area of 10328.47 Hectares of the 20 OC projects of WCL, SECL, MCL and CCL producing less than 5 mcm (Coal+OB) annually considered for monitoring during 2021-22; total excavated area is 2339.45 hectares, out of which 488.91 hectares (20.90%) is under plantation (*Biologically Reclaimed*), 1055.73 hectares (45.13%) area is under backfilling (*Technical Reclamation*) and 794.81 hectares (33.97%) area is under active mining. It is evident from the analysis that 1544.64 hectares (66.03%) area of the 20 OC

projects taken for monitoring for the year 2021-22 is under reclamation and balance 794.81 hectares (33.97%) area is under active mining. Company wise details of land reclamation of the above 20 projects is given in Table-1(A) & Fig-1.

- Out of 30 opencast projects of different subsidiaries of CIL producing less than 5 mcm (Coal+ OB) annually which were taken up for monitoring during the year 2018-19, total 10 opencast projects of different subsidiaries have now been diverted under category of those opencast mine which are producing more than 5 mcm (Coal+ OB) annually and balance 20 opencast projects producing less than 5 mcm (Coal+ OB) annually has been considered for land reclamation monitoring during year 2021-22. This has resulted in significant decrease in Technical reclamation (Area under backfilling) from 1329.06 Hectare area (43.56%) (Yr. 2018) to 1055.73 Hectare area (45.13%) (Yr. 2021) and total area under plantation (Green cover) has also decreased from 1864.05 Ha (9.22%) (Yr. 2018) to 1488.59 Ha (14.41%) (Yr. 2021) whereas total area under reclamation in 20 opencast projects of WCL, SECL, MCL and CCL has also decreased from 1766.51 Ha (57.90%) in the year 2018-19 to 1544.64 Ha (66.03%) in the year 2021-22.
- Study indicates that there is an increase in percentage of area under total plantation as such percentage of total plantation has been calculated with respect to total leasehold area. While percentage of technical reclamation and biological reclamation have been calculated with respect to total excavated area due to which there is an increase in technical reclamation and biological reclamation from 47.17% (Yr. 2018) to 49.66% (Yr. 2021) and from 12.28% (Yr. 2018) to 15.26% (Yr. 2021) respectively.
- *For Opencast Projects under Group (A) in table-1:* On comparing the status of land reclamation for 20 nos. of opencast projects in WCL, SECL, MCL and CCL carried out in year 2021-22 with respect to previous cycle study done in the year 2018-19 in these opencast projects of CIL's subsidiary, it is evident from the analysis that area of plantation on backfill (Biological Reclamation) has increased from 437.45 Hectare (14.34%) area in the year 2018 to 488.91 Hectare (20.90%) in the year 2021.
- *For Clusters under Group (B) in table-1:* total 9 cluster of mines, 5 in BCCL and 4 in ECL have been considered for monitoring during year 2021-22 as compared to total 08 cluster monitored

during year 2018-19. One additional cluster of mines in BCCL is taken up for monitoring this year on request of BCCL.

- Out of the total mine leasehold of 27750.54 Hectare for total no. of 09 cluster of mines; 05 in BCCL and 04 in ECL producing less than 5 mcm (Coal+OB) annually considered for monitoring during the Year 2021-22: total excavated area is 1270.18 Hectare out of which 61.92 hectare (4.87%) has been planted on backfill (Biologically Reclaimed), 736.90 hectare (58.02%) area is under backfilling (*Technical Reclamation*) and 471.36 hectare (37.11%) area is under active mining. It is also evident from Table -1(B) that 798.82 hectare (62.89%) area is under reclamation.
- From table-1(B) it is evident from analysis that 09 cluster of mines taken for monitoring, Technical reclamation (Area under backfilling) has increased from 634.58 Ha (57.09%) in the year 2018 to 736.90 Ha (58.02%) in the year 2021-22.
- It has also been observed from table-1(B) that biological reclamation for 09 cluster of mines in BCCL and ECL has decreased from 73.92 Ha (6.65%) (Yr.2018) to 61.92 Ha (4.87%) (Yr.2021).
- From Table (B), it is evident that total area under reclamation in BCCL and ECL consisting of together 9 clusters, have increased from 708.50 hectare (63.74%) in the year 2018 to 798.82 Ha (62.89%) in the year 2021 and total area under plantation (Green Cover) in the leasehold boundary of all cluster has also increased from 1779.20 Ha (7.35%) to 1956.94 Ha (7.05%) in the year 2021.
- On comparing the results obtained from Digital Image Processing of satellite data of the year 2018 & 2021, it is evident from table 1(B) that there is static or decreasing trend in the biological reclamation and increasing trend in technical reclamation in all 9 cluster of mines of BCCL and ECL.
- From Table 1(A) and 1(B) combined, it can be seen that total area under reclamation in the 20 OC mines of WCL, CCL, MCL, SECL and 09 clusters of BCCL and ECL considered for monitoring this year is 2343.46 Hectares, out of which 550.83 hectares (15.26%) has been planted on backfill (*Biologically Reclaimed*), 1792.63 Hectares area (49.66%) is under backfilling (*Technical Reclamation*) and balance 1266.17 hectares (35.08%) is under active mining.

Table-1
Company wise Land Reclamation Status in OC projects & Clusters of mines
producing (Less than 5 million Cu.m. (Coal + OB))based on Satellite Data of year 2021

Sl. No.	Coal Company (No. of OC Projects , Cluster of mines)		Area in Hectare (% calculated in respect of total excavated area)																	
			Leasehold / All Right Boundary		Technical Reclamation		Plantation				Area under Active Mining		Total Excavated Area		Total Area under Plantation (% Green Cover generated in Leasehold)		Total Area under Reclamation			
							Biological Reclamation		Other Plantation											
				Area under Backfilling		Area under Plantation on backfill		Plantation on External OB Dumps		Socail Forestry, Avenue Plantation etc.										
1	2		3		4		5		6		7		8		9 (=4+5+8)		10 (=5+6+7)		11 (=4+5)	
	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021
(A)	PROJECTWISE(OC)																			
1	WCL(12)	WCL (11)	6035.43	5407.55	476.26 45.35%	522.15 47.97%	86.81 8.27%	114.54 10.52%	386.79	409.22	324.66	341.46	487.22 46.39%	451.88 41.51%	1050.29	1088.57	798.26 13.23%	865.22 16.00%	563.07 53.61%	636.69 58.49%
2	SECL(03)	SECL(01)	3020.60	523.00	277.03 52.14%	86.00 38.05%	152.96 28.79%	140.00 61.95%	7.99	0.00	241.89	80.00	101.32 19.07%	0.00 0.00%	531.31	226.00	402.84 13.34%	220.00 42.07%	429.99 80.93%	226.00 100.00%
4	MCL(03)	MCL (01)	2035.83	437.10	164.06 45.39%	143.13 71.13%	1.13 0.31%	0.00 0.00%	14.30	8.53	27.86	10.13	196.29 54.30%	58.10 28.87%	361.48	201.23	43.29 2.13%	18.66 4.27%	165.19 45.70%	143.13 71.13%
5	CCL(12)	CCL (07)	9126.74	3960.82	411.71 37.16%	304.45 36.96%	196.55 17.74%	234.37 28.46%	250.72	97.37	172.39	52.97	499.77 45.10%	284.83 34.58%	1108.03	823.65	619.66 6.79%	384.71 9.71%	608.26 54.90%	538.82 65.42%
TOTAL (A)(30)		TOTAL (A) (20)	20218.60	10328.47	1329.06 43.56%	1055.73 45.13%	437.45 14.34%	488.91 20.90%	659.80	515.12	766.80	484.56	1284.60 42.10%	794.81 33.97%	3051.11	2339.45	1864.05 9.22%	1488.59 14.41%	1766.51 57.90%	1544.64 66.03%
(B)	CLUSTERSWISE																			
1	BCCL(04)	BCCL(05)	5883.96	9411.54	625.15 58.11%	712.90 58.52%	73.92 6.87%	61.92 5.08%	156.71	149.84	570.04	757.18	376.70 35.02%	443.36 36.40%	1075.77	1218.18	800.67 13.61%	968.94 10.30%	699.07 64.98%	774.82 63.60%
2	ECL(04)	ECL (04)	18339.00	18339.00	9.43 26.37%	24.00 46.15%	0.00 0.00%	0.00 0.00%	0.00	0.00	978.53	988.00	26.33 73.63%	28.00 53.85%	35.76	52.00	978.53 5.34%	988.00 5.39%	9.43 26.37%	24.00 46.15%
TOTAL (B)(08)		TOTAL(B) (09)	24222.96	27750.54	634.58 57.09%	736.90 58.02%	73.92 6.65%	61.92 4.87%	156.71	149.84	1548.57	1745.18	403.03 36.26%	471.36 37.11%	1111.53	1270.18	1779.20 7.35%	1956.94 7.05%	708.50 63.74%	798.82 62.89%
TOTAL CIL (A+B) (38) Less than 5 MCM		TOTAL CIL (A+B) (29)	44441.56	38079.01	1963.64 47.17%	1792.63 49.66%	511.37 12.28%	550.83 15.26%	816.51	664.96	2315.37	2229.74	1687.63 40.54%	1266.17 35.08%	4162.64	3609.63	3643.25 8.20%	3445.53 9.05%	2475.01 59.46%	2343.46 64.92%

In reference of the above Table, different parameters are classified as follows:

1. Area under **Biological Reclamation** includes Areas under Plantation done on Backfilled Area Only.
2. Area under **Technical Reclamation** includes Area under Barren Backfilling only
3. Area under Active Mining Includes Coal Quarry, Advance Quarry Site, Quarry filled with water etc., if any.
4. Social Forestry and Plantation on External OB Dumps are not included in Biological Reclamation and are put under separate categories as shown in the Table above.

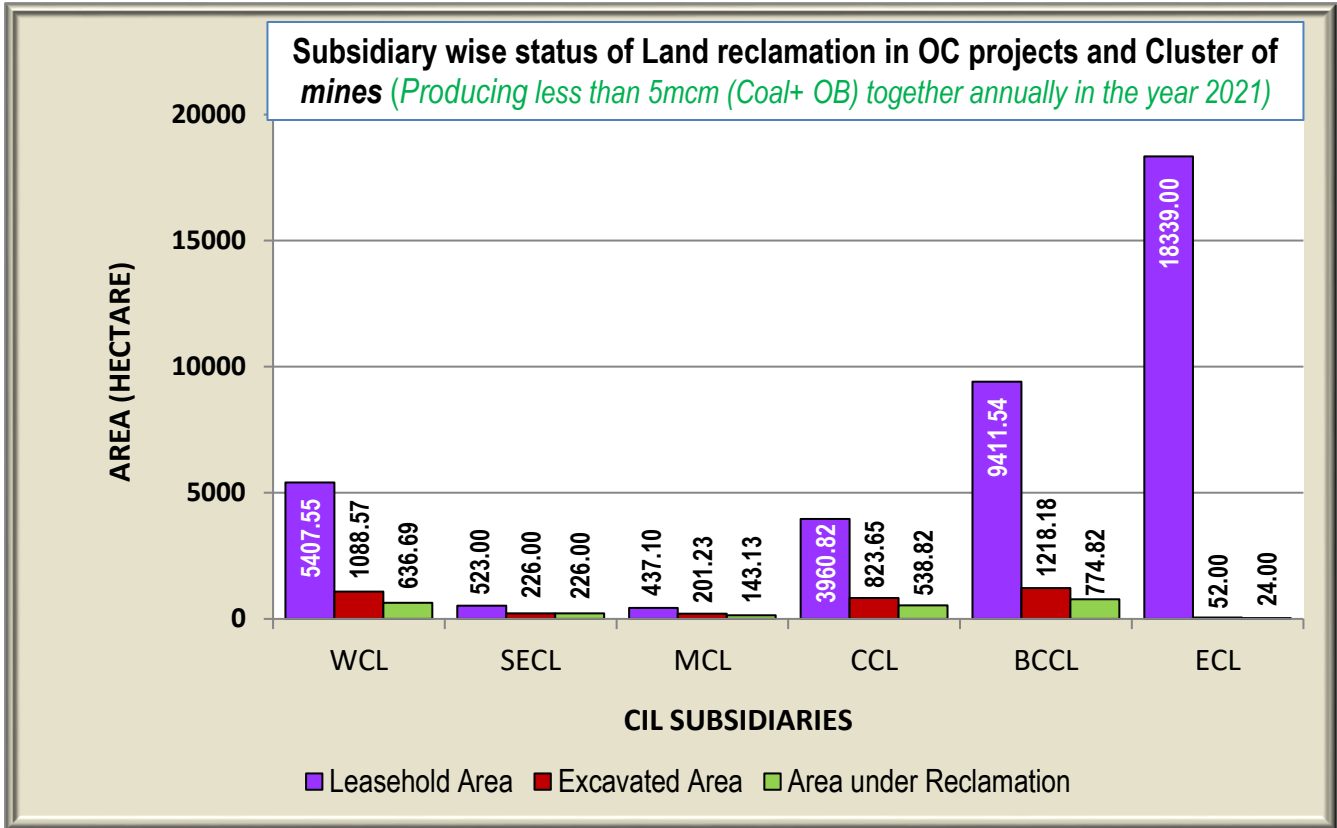


Fig. 1 : Company wise Land Reclamation Status in the Year 2021

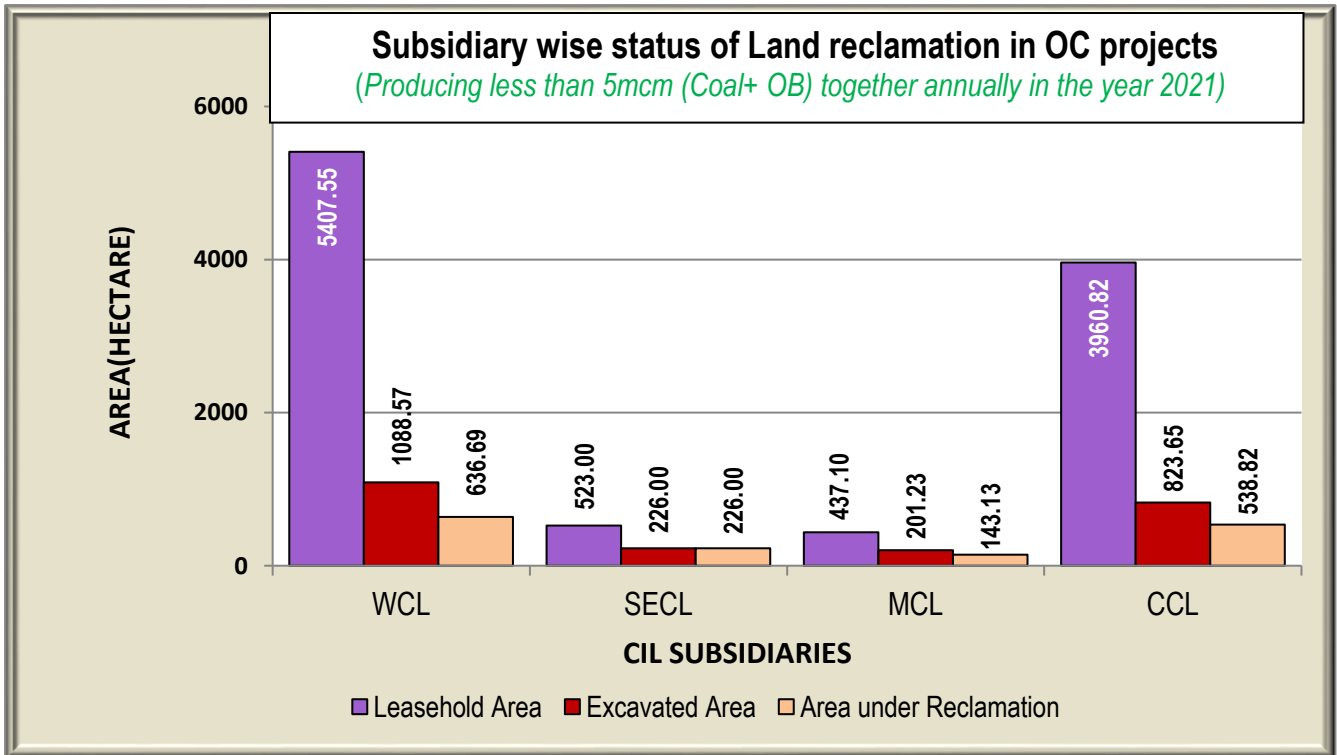


Fig. 2 : Company wise Land Reclamation Status in OC projects the Year 2021

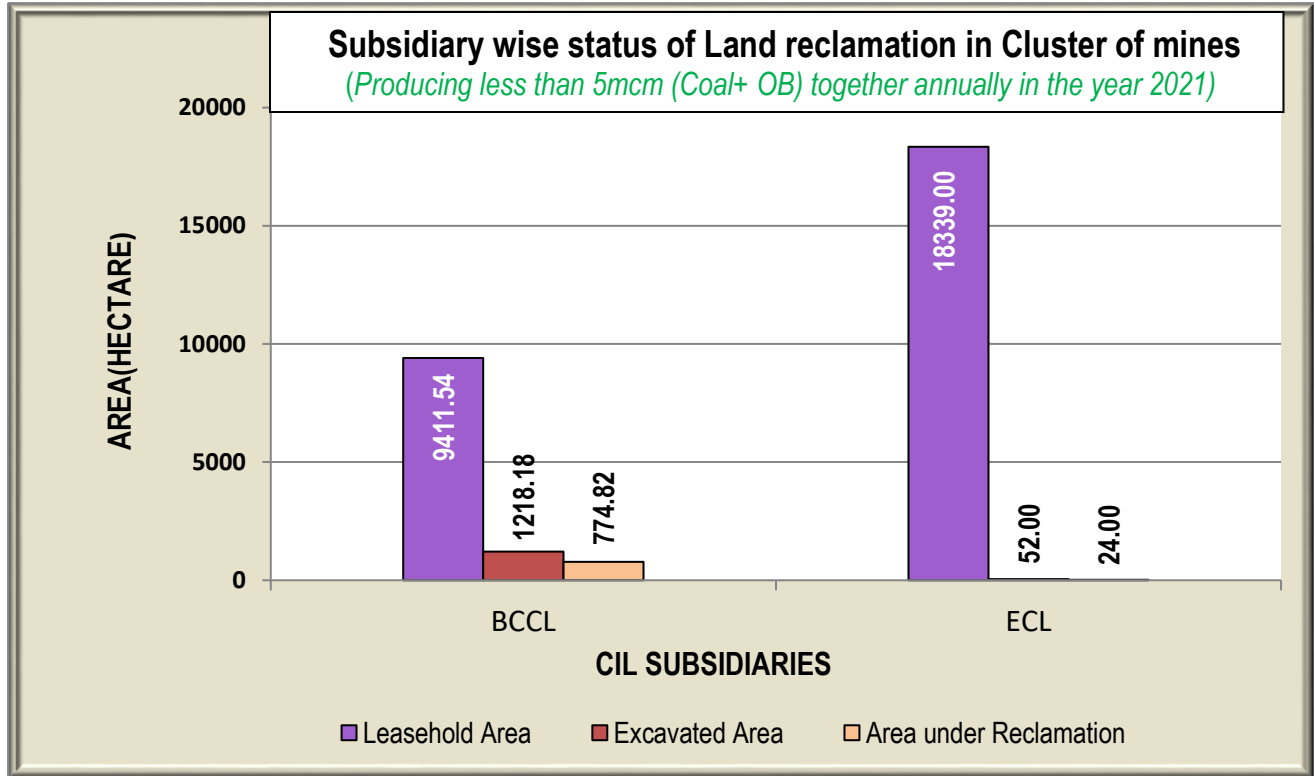


Fig.3 : Company wise Land Reclamation Status in OC projects the Year 2021

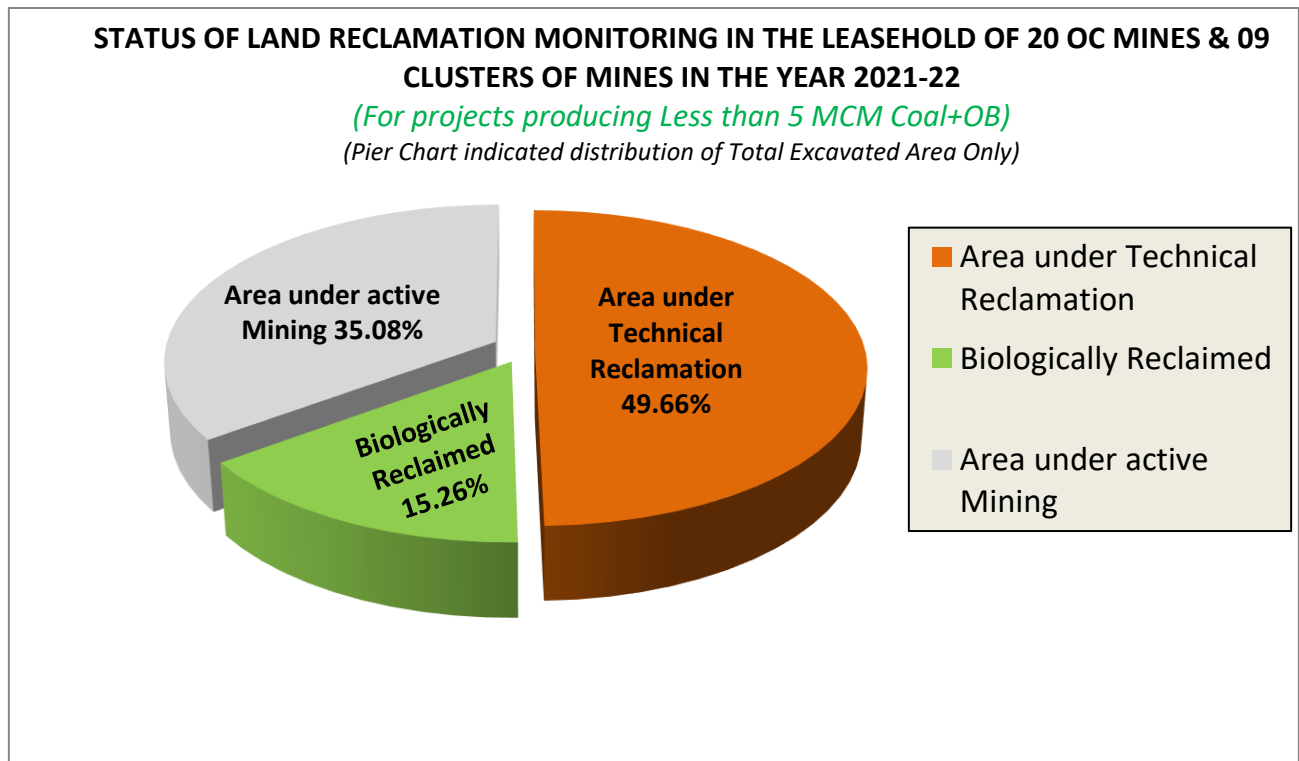


Fig4: Pie Chart indicating Land Reclamation Status in 2021

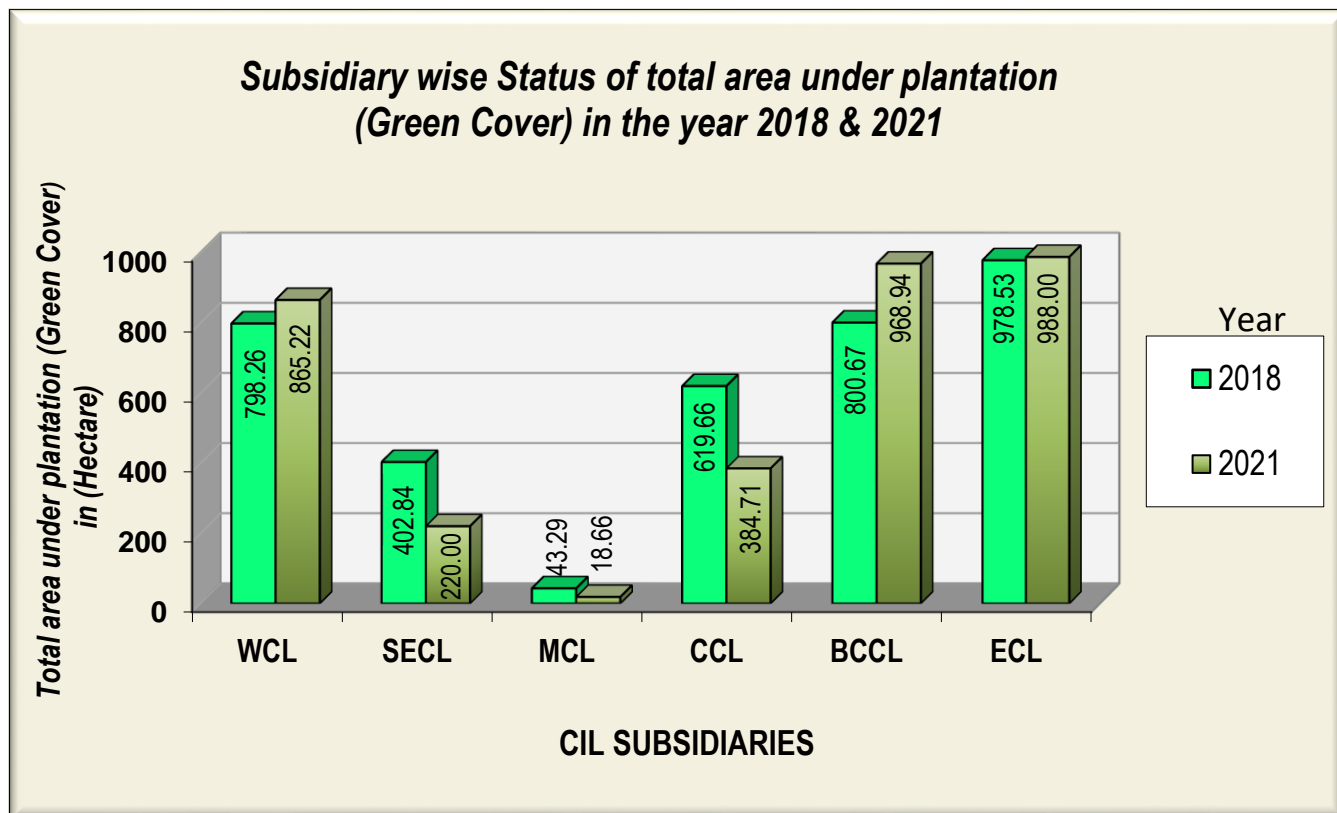


Fig 5: Bar Chart indicating status of total area under plantation (Green Cover) in the year 2018 & 2021

1.0 Background

1.1 Land is the most important natural resource which embodies soil, water, flora, fauna and total ecosystem. All human activities are based on the land which is the most scarce natural resource in our country. Mining is a site specific industry and it could not be shifted anywhere else from the location where mineral occurs. It is a fact that surface mining activities do effect the land environment due to ground breaking. Therefore, there is an urgent need to reclaim and restore the mined out land for its productive use for sustainable development of mining. This will not only mitigate environmental degradation, but would also help in creating a more congenial environment for land acquisition by coal companies in future.

1.2 Keeping above in view, a work order vide letter no. CIL/WBP/ENV./2011dated23/08/11 was issued by CIL for monitoring of less than 5 million m³ per annum capacity (Coal +OB)

projects from the year 2011 at interval of three years. Further, a revised work order was issued vide letter no. CIL/WBP/Env/2011/4706 dated 12.10.2012 from Coal India Limited for the period 2012-13 to 2016-17 which was subsequently followed by another work order vide letter no. CIL/WBP/Env/2017/DP/8477 dated 21.09.2017 from Coal India Limited for the period 2017-18 to 2021-22 for land reclamation monitoring of opencast projects and vegetation cover monitoring of 19 major coalfields. According to this work order, all mines in CIL with output capacity of 5 million cu. m (coal +OB) shall be monitored every year and all mines below this capacity shall be monitored at an interval of 3 yrs. All coalfields in CIL shall also be monitored at an interval of 3 years as per a defined plan. The result of land reclamation status of all such mines to be put on the website of CIL, (www.coalindia.in), CMPDI (www.cmpdi.co.in) and the concerned coal companies in public domain. Detail report to be submitted to Coal India Limited and respective subsidiaries.

- 1.3** Land reclamation monitoring of all opencast coal mining projects would also comply the statutory requirements of Ministry of Environment & Forest (MoEF). Such monitoring would not only facilitate in taking timely mitigation measures against environmental degradation, but would also enable coal companies to utilize the reclaimed land for larger socio-economic benefits in a planned way.

- 1.4** CMPDI undertook the above study and the present report is embodying the findings in nutshell carrying out for the 20 opencast projects of different subsidiaries and 09 clusters of BCCL and ECL producing less than 5 million cubic m. Coal+OB annually in the year 2021-22 for baseline data generation and updation of database of these projects so that progressive changes in the status of land reclamation could be assessed in future.

2.0 Objective

Objective of the land reclamation/restoration monitoring is to assess the area of backfilled, plantation, OB dumps, social forestry, active mining area, settlements and water bodies, distribution of wasteland, agricultural land and forest land in the leasehold area of the project. This is an important step taken up for assessing the progressive status of mined land reclamation and for taking up remedial measures, if any, required for environmental protection.

3.0 Methodology

There are number of steps involved between raw satellite data procurement and preparation of final map. National Remote Sensing Centre (NRSC) Hyderabad, being the nodal agency for satellite data supply in India, provides only raw digital satellite data, which needs further digital image processing for extracting the information and map preparation before uploading the same in the website. Methodology for land reclamation monitoring is given in fig 4. Following steps are involved in land reclamation /restoration monitoring:

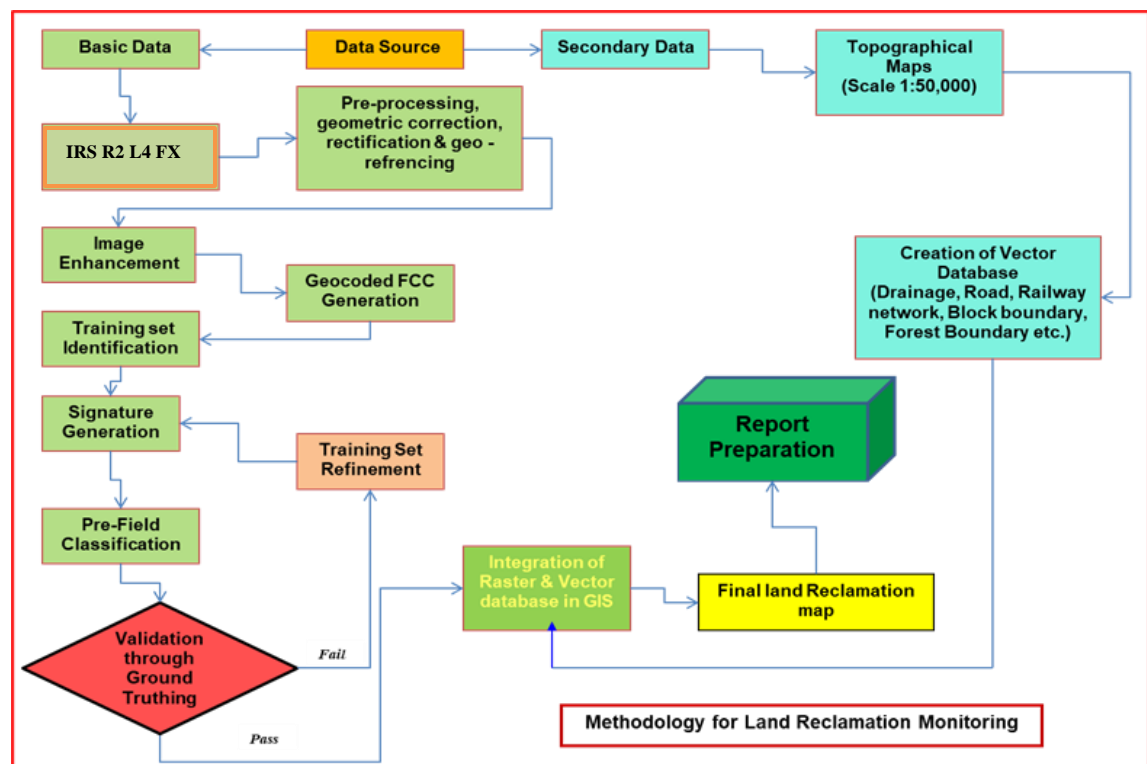


Fig : 6 Methodology for Land Reclamation Monitoring

3.1 Data Procurement: After browsing the data quality and date of pass on internet, supply order for data is placed to NRSC. Secondary data like leasehold boundary, topo sheets are procured for creation of vector database.

3.2 Satellite Data Processing: Satellite data are processed using ERDAS IMAGINE v2014 s/w digital image processing s/w. Methodology involves the following major steps:

- **Rectification & Georeferencing:** Inaccuracies in digital imagery may occur due to ‘systematic errors’ attributed to earth curvature and rotation as well as ‘non-systematic errors’ attributed to satellite receiving station itself. Raw digital images contain geometric distortions, which make them unusable as maps. Therefore, georeferencing is required for correction of image data using ground control points (GCP) to make it compatible to Sol toposheet.

- **Image enhancement:**

To improve the interpretability of the raw data, image enhancement is necessary. Local operations modify the value of each pixel based on brightness value of neighbouring pixels using ERDAS IMAGINE v 2014 s/w and enhance the image quality for interpretation.

- **Training set selection**

Training set requires to be selected, so that software can classify the image data accurately. The image data are analysed based on the interpretation keys. These keys are evolved from certain fundamental image-elements such as tone/colour, size, shape, texture, pattern, location, association and shadow. Based on the image-elements and other geo-technical elements like land form, drainage pattern

and physiography; training sets were selected/identified for each land use/cover class. Field survey was carried out by taking selective traverses in order to collect the ground information (or reference data) so that training sets are selected accurately in the image. This was intended to serve as an aid for classification.

- **Classification and Accuracy assessment**

Image classification is carried out using the maximum likelihood algorithm. The classification proceeds through the following steps: (a) calculation of statistics [i.e. signature generation] for the identified training areas, and (b) the decision boundary of maximum probability based on the mean vector, variance, covariance and correlation matrix of the pixels. After evaluating the statistical parameters of the training sets, reliability test of training sets is conducted by measuring the statistical separation between the classes that resulted from computing divergence matrix. The overall accuracy of the classification was finally assessed with reference to ground truth data.

- **Area calculation**

The area of each land use class in the leasehold is determined using ERDAS IMAGINE v2014 s/w.

- **Overlay of Vector data base**

Vector data base created based on secondary data. Vector layer like drainage, railway line, leasehold boundary, forest boundary etc. are superimposed on the image as vector layer in the Arc GIS database.

- **Pre-field map preparation**

Pre-field map is prepared for validation of the classification result

CENTRAL COALFIELDS LIMITED

8.0 Land Reclamation Status in Central Coalfields Limited

8.1 Following 07 opencast projects of CCL producing less than 5 million cubic m. (Coal+OB) together annually were taken up for land reclamation monitoring during the year 2021-22 :

- Tetariakhar
- Dakra
- Giddi-A
- Pundi
- Kedla
- Jarangdih
- Karma

8.2 Project wise Land Reclamation status in CCL is given in Table 8.1 and also shown graphically in Fig 8.1. Area statistics of different land use classes present in the mine leasehold of the above projects for the year 2021 are shown in the Table - 8.2. Land use maps derived from satellite data are shown in Plate 8.1 - 8.7. Different land use classes based on satellite data are depicted in Bar Charts in Fig.8.2 - 8.8 for the year 2018 and 2021.

8.3 Study reveals that out of total mine leasehold area of 3960.82 Ha of 7 OC projects in CCL Viz Teteriakhar ,Dakra ,Giddia-A ,Pundi ,Kedla ,Jarangdih and Karma OC considered for monitoring during year 2021-22 ; total excavated area is 823.65 Ha ,out of which 234.37 Ha (28.46%) area has been revegetated (Biologically reclaimed) and 304.45 Ha (36.96%) area is under backfilling (Technically reclaimed) and balance 284.83 Hectare (34.58%) area is under active mining. It is evident from analysis that 538.82 Hectare (65.42%) area of above OC projects is under total reclamation in CCL. Projectwise details area given in Table-8.1

8.4 On comparing the status of land reclamation for the year 2021 with respect to the year 2018 in different opencast mine of CCL taken for reclamation monitoring in the year 2021-22 ,it is evident from table-8.1 that area under total reclamation has increased from 398.30 Ha(61.55%) in the year 2018 to 538.82 Ha (65.42%) in the year 2021.

This increase of 140.52 Hectare area under total reclamation in CCL is due to increase of 87.36 Ha area under plantation on backfill (Biological reclamation) and 53.16 Ha area under backfilling (Technical reclamation) respectively.

- 8.5** There has been increase in area under technical reclamation in all projects of CCL in the year 2021, except in Giddi - A OCP where area under technical reclamation has decreased significantly as compared to the year 2018. Area under backfilling (Technical reclamation) in this OC mine has decreased from 109.10 Hectare(43.92%) (Yr..2018) to 90.81Hectare (37.30%) (Yr.2021).whereas plantation on backfill (Biological reclamation) has gone up from 80.14 Hectare (32.26%) in 2018 to 84.88 Hectare (34.87%) in the year 2022.
- 8.6** After analyzing the satellite data of year 2018 vs. 2021 it is evident that total area under plantation (Green Cover) carried out on backfilled area, OB dumps as well as under social forestry in all the mines of CCL has increased from 304.73 Hectare (7.69%) to 384.71 Hectare (9.71%) in the span of three years. This increase of 79.98 Hectare area of total plantation (Green Cover) in three year time is due to the sincere efforts made by CCL towards land reclamation of above mentioned OC mine and environment protection.
- 8.7** In Dakra OCP, area under plantation on OB has decreased from 4.90 Hectare (Yr. 2018) to 1.11 Hectare (Yr. 2021) and plantation on backfill has also decreased from 45.79 Ha (Yr.2018) to 37.86 Ha (Yr. 2021). This decrease of 3.79 Hectare area in plantation on OB and 7.93 Hectare area in plantation on backfill (Biological reclamation) are mainly due to dumping of barren OB and barren backfill over planted area. However, overall increase in revegetated area (Biological reclamation) in the year 2021 is 87.36 Hectare with respect to the year 2018.
- 8.8** Out of 7 projects of CCL, Dakra OCP ranks on top for land reclamation (79.32%) followed by Kedla OCP (79.19%) and Giddi - A OCP (72.17%) respectively.
- 8.9** This study will again will be carried out after an interval of three years to assess the land reclamation status in the above projects.

Table: 8.1
Project wise Land Reclamation Status in Opencast Project producing (<5 mcm (Coal+OB)) of Central Coalfields Ltd based on the Satellite data of the Year 2021

(Area in Hectare)

Sl.No.	Project	Total Leasehold Area		Technical Reclamation		Plantation						Area under Active Mining	Total Excavated Area		Total Area under Plantation (% Green Cover Generated in Leasehold)		Total Area under Reclamation		
						Biological Reclamation		Other Plantations											
						Area under Backfilling		Plantation on Excavated / Backfilled Area		Plantation on External Over Burden Dumps									Social Forestry, Awanue Plantation Etc.
1	2	3		4		5		6		7		8		9 (=4+5+8)		10 (=5+6+7)		11(=4+5)	
		2018	2021	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021	2018	2021
1	Tetariakhar	208.47	208.47	0.00	0.00	0.00	0.00	0.00	0.00	1.45	1.45	41.29	40.19	41.29	40.19	1.45	1.45	0.00	0.00
				0.00%	0.00%	0.00%	0.00%					100.00%	100.00%			0.70%	0.70%	0.00%	0.00%
2	Dakra	249.72	249.72	27.03	47.98	45.79	37.86	4.90	1.11	9.82	15.77	24.05	22.38	96.87	108.22	60.51	54.74	72.82	85.84
				27.90%	44.34%	47.27%	34.98%					24.83%	20.68%			24.23%	21.92%	75.17%	79.32%
3	Giddi-A	510.00	510.00	109.10	90.81	80.14	84.88	43.90	40.61	14.00	13.84	59.16	67.74	248.40	243.43	138.04	139.33	189.24	175.69
				43.92%	37.30%	32.26%	34.87%					23.82%	27.83%			27.07%	27.32%	76.18%	72.17%
4	Pundi	1357.20	1357.20	35.87	37.85	13.88	13.88	22.36	22.35	1.35	1.35	30.75	43.39	80.50	95.12	37.59	37.58	49.75	51.73
				44.56%	39.79%	17.24%	14.59%					38.20%	45.62%			2.77%	2.77%	61.80%	54.38%
5	Kedla	1157.42	1157.42	49.76	90.56	0.00	90.56	26.75	20.24	1.46	1.46	45.92	47.60	95.68	228.72	28.21	112.26	49.76	181.12
				52.01%	39.59%	0.00%	39.59%					47.99%	20.81%			2.44%	9.70%	52.01%	79.19%
6	Jarangdih	179.05	179.05	29.53	29.51	7.20	7.19	3.50	3.44	18.93	17.83	17.83	22.24	54.56	58.94	29.63	28.46	36.73	36.70
				54.12%	50.07%	13.20%	12.20%					32.68%	37.73%			16.55%	15.90%	67.32%	62.27%
7	Karma	298.96	298.96	0.00	7.74	0.00	0.00	8.03	9.62	1.27	1.27	29.77	41.29	29.77	49.03	9.30	10.89	0.00	7.74
				0.00%	15.79%	0.00%	0.00%					100.00%	84.21%			3.11%	3.64%	0.00%	15.79%
	TOTAL	3960.82	3960.82	251.29	304.45	147.01	234.37	109.44	97.37	48.28	52.97	248.77	284.83	647.07	823.65	304.73	384.71	398.30	538.82
				38.84%	36.96%	22.72%	28.46%					38.45%	34.58%			7.69%	9.71%	61.55%	65.42%

(% is calculated with respected to Excavated Area as applicable)

Note: In reference of the above Table-6.1, Different Parameter are classified as follows:

1. Area under Biological Reclamation includes area under plantation done on backfilled area only.
2. Area under Technical Reclamation includes area under barren backfill only.
3. Area under Active Mining includes Coal Quarry, Advance quarry site, Quarry filled with water etc.
4. Social Forestry and Plantation on External OB Dump area not included in Biological reclamation and are put under other plantation.
5. % calculated in respect of total excavated area except for "Total area under plantation" where % has been calculated in terms of leasehold area.
6. Total six opencast mine of CCL named as Rohini, Purnadih, Kathara, North Urimari, Karo, Konar Expn, Selected Dhori & Tapin North OC have been included under category of those oc mines which have capacity of producing more than 5 million cubic meter (Coal +OB) annually.

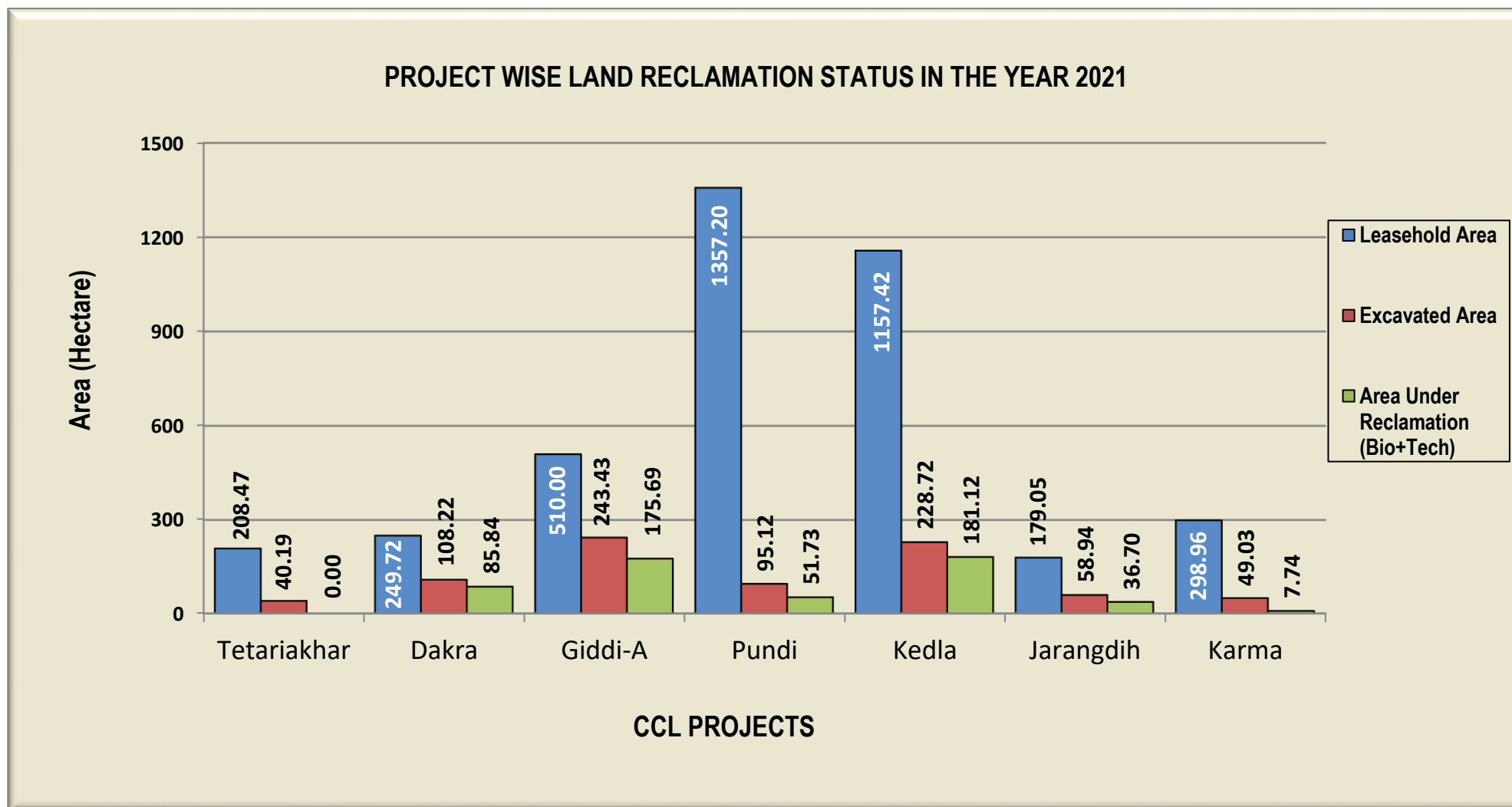


Figure. 8.1: Land Reclamation Status in OC Projects producing Less than 5mcm (Coal+OB) of CCL in the Year 2021

TABLE-8.2
AREA STATISTICS OF LAND USE/ COVER CLASSES IN OPENCAST PROJECTS PRODUCING
(<5 MCM COAL+OB) OF CCL BASED ON SATELLITE DATA OF THE YEAR 2021

(Area in Hectare)

	TETARIAKHAR		DAKRA		GIDDI-A		PUNDI		KEDLA		JARANGDIH		KARMA		TOTAL		
	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	
FORESTS	Dense Forest	0.02	0.01	0.00	0.00	0.00	0.00	182.67	13.46	0.00	0.00	0.00	0.00	0.00	0.00	182.69	4.61
	Open Forest	5.09	2.44	0.00	0.00	0.00	0.00	235.65	17.36	174.07	15.04	0.00	0.00	15.08	5.04	429.89	10.85
	Total Forest (A)	5.11	2.45	0.00	0.00	0.00	0.00	418.32	30.82	174.07	15.04	0.00	0.00	15.08	5.04	612.58	15.47
	Scrubs(B)	40.64	19.49	54.68	21.90	52.13	10.22	301.95	22.25	397.87	34.38	26.02	14.53	60.60	20.27	933.89	23.58
PLANTATION	Social Forestry	1.45	0.70	15.77	6.32	13.84	2.71	1.35	0.10	1.46	0.13	17.83	9.96	1.27	0.42	52.97	1.34
	Plantation on OB Dump	0.00	0.00	1.11	0.44	40.61	7.96	22.35	1.65	32.61	2.82	3.44	1.92	9.62	3.22	109.74	2.77
	Plantation on Backfill (Biological Reclamation)	0.00	0.00	37.86	15.16	84.88	16.64	13.88	1.02	20.24	1.75	7.19	4.02	0.00	0.00	164.05	4.14
	Total Plantation(C)	1.45	0.70	54.74	21.92	139.33	27.32	37.58	2.77	54.31	4.69	28.46	15.90	10.89	3.64	326.76	8.25
	Total Vegetation(A+B+C)	47.20	22.64	109.42	43.82	191.46	37.54	757.85	55.84	626.25	54.11	54.48	30.43	86.57	28.96	1873.23	47.29
ACTIVE MINING	Coal Quarry	27.70	13.29	12.11	4.85	18.02	3.53	21.52	1.59	28.38	2.45	20.22	11.29	37.25	12.46	165.20	4.17
	Advance Quarry Site	2.00	0.96	2.29	0.92	4.32	0.85	6.48	0.48	1.11	0.10	1.28	0.71	0.00	0.00	17.48	0.44
	Quarry Filled With Water	10.49	5.03	7.98	3.20	45.40	8.90	15.39	1.13	18.11	1.56	0.74	0.41	4.04	1.35	102.15	2.58
	Total Area under Active Mining(D)	40.19	19.28	22.38	8.97	67.74	13.28	43.39	3.20	47.60	4.11	22.24	12.41	41.29	13.81	284.83	7.19
WASTE LANDS/ MINING AREA	Coal Dump	20.08	9.63	2.94	1.18	5.52	1.08	4.18	0.31	5.49	0.47	4.39	2.45	6.51	2.18	49.11	1.24
	Barren OB Dump	46.71	22.41	9.19	3.68	13.15	2.58	30.45	2.24	29.23	2.53	12.52	6.99	46.82	15.66	188.07	4.75
	Area Under Backfilling (Technical Reclamation)	0.00	0.00	47.98	19.21	90.81	17.81	37.85	2.79	90.56	7.82	29.51	16.48	7.74	2.59	304.45	7.69
	Total Area under Mine Operation(D+E)	106.98	51.32	82.49	33.04	177.22	34.75	115.87	8.54	172.88	14.93	68.66	38.33	102.36	34.24	826.46	20.87
WASTELAND	Waste Lands	14.46	6.94	10.99	4.40	33.27	6.52	125.57	9.25	74.01	6.39	18.01	10.06	21.21	7.09	297.52	7.51
	Fly Ash Pond / Sand Body	0.00	0.00	0.00	0.00	5.98	1.17	3.03	0.22	0.66	0.06	0.97	0.54	9.83	3.29	20.47	0.52
	Total Wasteland	14.46	6.94	10.99	4.40	39.25	7.70	128.60	9.48	74.67	6.45	18.98	10.60	31.04	10.38	317.99	8.03
WATERBODY	Reservoir, Nallah, Ponds	6.10	2.93	1.10	0.44	17.95	3.52	8.68	0.64	16.58	5.53	2.28	1.27	12.04	4.03	64.73	1.63
	Total Waterbodies	6.10	2.93	1.10	0.44	17.95	3.52	8.68	0.64	16.58	5.53	2.28	1.27	12.04	4.03	64.73	1.63
AGRICULTURE	Crop Lands	0.00	0.00	0.00	0.00	0.00	0.00	127.37	9.38	1.48	0.13	0.62	0.35	0.00	0.00	129.47	3.27
	Fallow Lands	32.46	15.57	1.61	0.64	2.49	0.49	186.01	13.71	201.56	17.41	0.00	0.00	60.01	20.07	484.14	12.22
	Total Agriculture	32.46	15.57	1.61	0.64	2.49	0.49	313.38	23.09	203.04	17.54	0.62	0.35	60.01	20.07	613.61	15.49
SETTLEMENTS	Urban Settlement	0.00	0.00	18.28	7.32	61.14	11.99	6.91	0.51	26.71	2.31	31.96	17.85	0.00	0.00	145.00	3.66
	Rural Settlement	0.40	0.19	17.18	6.88	0.00	0.00	21.80	1.61	26.14	2.26	0.00	0.00	5.57	1.86	71.09	1.79
	Industrial Settlement	0.87	0.42	8.65	3.46	20.49	4.02	4.11	0.30	11.15	0.96	2.07	1.16	1.37	0.46	48.71	1.23
	Total Settlements	1.27	2.93	44.11	17.66	81.63	16.01	32.82	2.42	64.00	5.53	34.03	19.01	6.94	2.32	264.80	6.69
	Grand Total	208.47	100.00	249.72	100.00	510.00	100.00	1357.20	100.00	1157.42	100.00	179.05	100.00	298.96	100.00	3960.82	100.00

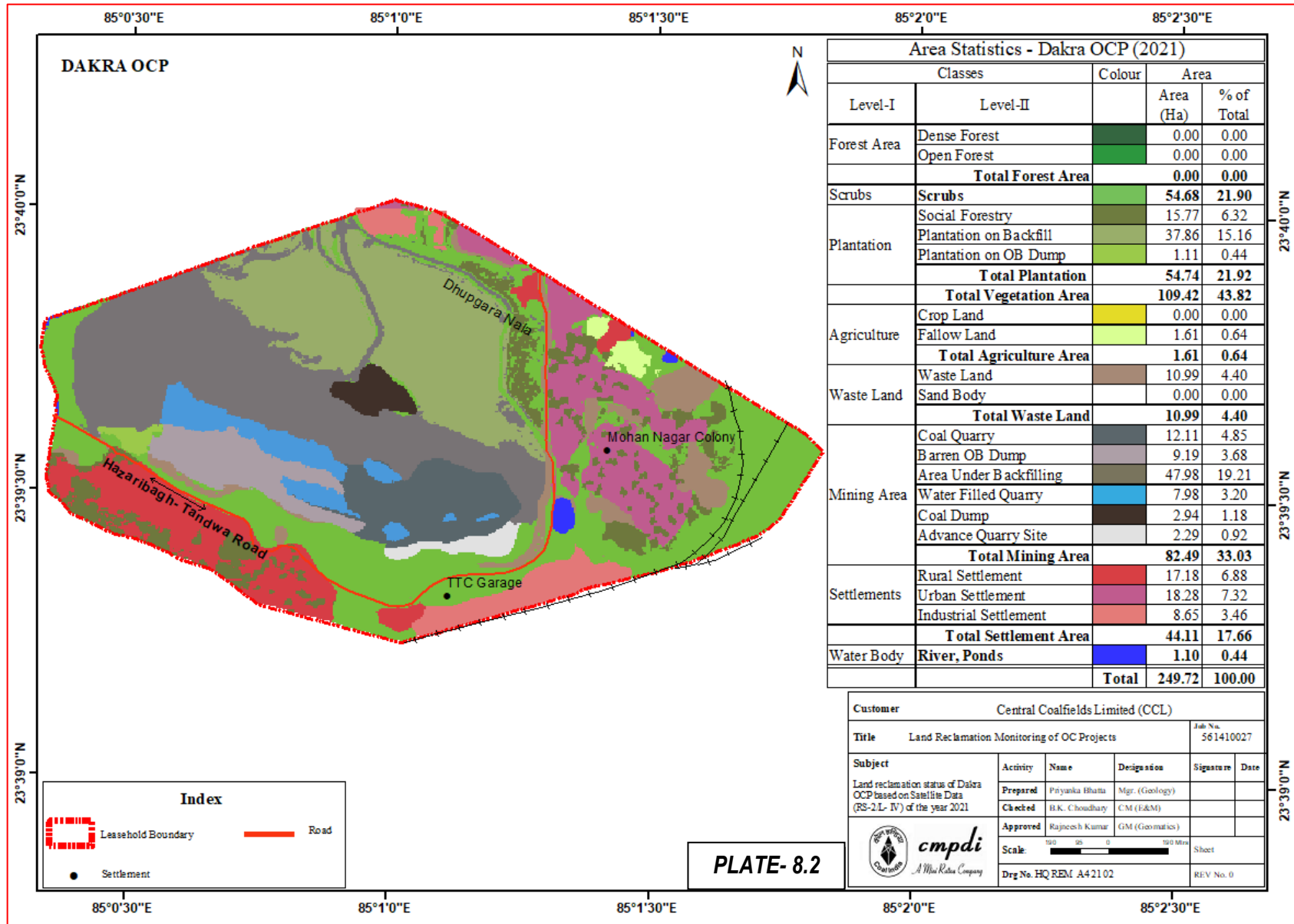


PLATE- 8.2



cmpdi
A Mini Ratna Company

Central Mine Planning & Design Institute Ltd.

(A Subsidiary of Coal India Ltd.)

Gondwana Place, Kanke Road, Ranchi 834031, Jharkhand

Phone : (+91) 651 2230001, 2230002, 2230483, FAX (+91) 651 2231447, 2231851

Website : www.cmpdi.co.in, Email : cmpdihq@cmpdi.co.in

CD No - 164
9/5/23

CENTRAL Hospital information (History, facilities, staff, etc)

Details of IME/PME of last 5 years from the Area

NK AREA DAKRA

S. No.	Year	Man Power	Target	PME		Total	IME		Total
				Below 45 Yrs	Above 45 Yrs		CCL	Contractual	
1	2018		462	170	302	479	25	242	267
2	2019		664	203	313	516	50	276	326
3	2020		450	260	340	600	60	108	168
4	2021		853	455	414	869	47	246	293
5	2022		806	321	422	743	32	130	162


9/5/23
Dy. Chief Medical Officer.
C.H., Dakra
Ranchi (JH)

Disease report of last 5 years from the Area

NK AREA DAKRA

Area	Year	Total No of PME	Hypertension	Diabetics	Eye Problem	Hearing Impairment (Partial)	Back Problem	Spinal Injuri	CA D	Dyslipidemia	Respiratory Disease	Skin Disease Detected / Reacted	Cancer Detected / Reacted	Psychiatric	Obesity	Pneumoconiosis	Sleepinsomania	CVA / Paralysis
NK AREA	2018	490	27	59	03	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
"	2019	516	06	62	04	"	"	"	"	"	"	"	"	"	"	"	"	"
"	2020	600	30	53	08	"	"	"	"	"	"	"	"	"	"	"	"	"
"	2021	869	37	70	06	"	"	"	"	"	"	"	"	"	"	"	"	"
"	2022	743	37	62	17	"	"	"	"	NIL	Asthma 01	"	"	"	"	"	"	"


 9/5/23
 Dy. Chief Medical Officer,
 C.H., Dakra
 Ranchi (JH)

**TEST REPORT**

09/23 Test Report No. 2212	Job No. 094323120	Year	FY2023-24
Type of Sample	Ambient Air	Quarter Ending	Sep-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : North Karanpura **Project:** Dakra OCP **Stations:** P.O.Office

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter ($\text{PM}_{10} + >\text{PM}_{10}$)TPM	Particulate Matter (PM_{10})	Particulate Matter ($\text{PM}_{2.5}$)	Sulphur Dioxide (SO_2)	Nitrogen Oxides (as NO_x)	
Jul-23 1st FN	04/07/23-05/07/23	17-07-2023	17/07/23-24/07/23	228	112	48	< 25	< 6	East Sunny
Jul-23 2nd FN	18/07/23-19/07/23	01-08-2023	01/08/23-05/08/23	168	86	42	< 25	< 6	East Sunny
Aug-23 3rd FN	02/08/23-03/08/23	16-08-2023	16/08/23-22/08/23	186	96	51	< 25	< 6	East Cloud
Aug-23 4th FN	17/08/23-18/08/23	01-09-2023	01/09/23-09/09/23	218	106	58	< 25	< 6	East Cloud
Sep-23 5th FN	02/09/23-03/09/23	18-09-2023	18/09/23-20/09/23	186	87	39	< 25	< 6	East Sunny
Sep-23 6th FN	19/09/23-20/09/23	03-10-2023	03/10/23-11/10/23	174	72	35	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

Analysed By

Authorized Signatory

**TEST REPORT**

09/23 Test Report No. 2213	Job No. 094323120	Year	FY2023-24
Type of Sample	Ambient Air	Quarter Ending	Sep-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : North Karanpura **Project:** Dakra OCP **Stations:** Mohan Nagar Colony

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter ($\text{PM}_{10} + >\text{PM}_{10}$)TPM	Particulate Matter (PM_{10})	Particulate Matter ($\text{PM}_{2.5}$)	Sulphur Dioxide (SO_2)	Nitrogen Oxides (as NO_x)	
Jul-23 1st FN	04/07/23-05/07/23	17-07-2023	17/07/23-24/07/23	124	46	19	< 25	< 6	East Sunny
Jul-23 2nd FN	18/07/23-19/07/23	01-08-2023	01/08/23-05/08/23	138	66	30	< 25	< 6	East Sunny
Aug-23 3rd FN	02/08/23-03/08/23	16-08-2023	16/08/23-22/08/23	114	42	17	< 25	< 6	East Cloud
Aug-23 4th FN	17/08/23-18/08/23	01-09-2023	01/09/23-09/09/23	134	71	36	< 25	< 6	East Cloud
Sep-23 5th FN	02/09/23-03/09/23	18-09-2023	18/09/23-20/09/23	110	51	21	< 25	< 6	East Sunny
Sep-23 6th FN	19/09/23-20/09/23	03-10-2023	03/10/23-11/10/23	120	54	23	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

Analysed By

Authorized Signatory

**TEST REPORT**

09/23 Test Report No. 2214	Job No. 094323120	Year	FY2023-24
Type of Sample	Ambient Air	Quarter Ending	Sep-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : North Karanpura **Project:** Dakra OCP **Stations:** Nehru Stadium

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter ($\text{PM}_{10} + >\text{PM}_{10}$)TPM	Particulate Matter (PM_{10})	Particulate Matter ($\text{PM}_{2.5}$)	Sulphur Dioxide (SO_2)	Nitrogen Oxides (as NO_x)	
Jul-23 1st FN	05/07/23-06/07/23	17-07-2023	17/07/23-24/07/23	163	62	34	< 25	< 6	East Sunny
Jul-23 2nd FN	19/07/23-20/07/23	01-08-2023	01/08/23-05/08/23	152	55	31	< 25	< 6	East Sunny
Aug-23 3rd FN	03/08/23-04/08/23	16-08-2023	16/08/23-22/08/23	127	50	28	< 25	< 6	East Cloud
Aug-23 4th FN	18/08/23-19/08/23	01-09-2023	01/09/23-09/09/23	160	81	45	< 25	< 6	East Cloud
Sep-23 5th FN	03/09/23-04/09/23	18-09-2023	18/09/23-20/09/23	115	45	23	< 25	< 6	East Sunny
Sep-23 6th FN	20/09/23-21/09/23	03-10-2023	03/10/23-11/10/23	135	62	28	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

Analysed By

Authorized Signatory

**TEST REPORT**

09/23 Test Report No. 2215	Job No. 094323120	Year	FY2023-24
Type of Sample	Ambient Air	Quarter Ending	Sep-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : North Karanpura **Project:** Dakra OCP **Stations:** Workshop

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter (PM ₁₀ + >PM ₁₀)TPM	Particulate Matter (PM ₁₀)	Particulate Matter (PM _{2.5})	Sulphur Dioxide (SO ₂)	Nitrogen Oxides (as NO _x)	
Jul-23 1st FN	05/07/23-06/07/23	17-07-2023	17/07/23-24/07/23	218	106	54	< 25	< 6	East Sunny
Jul-23 2nd FN	19/07/23-20/07/23	01-08-2023	01/08/23-05/08/23	120	62	21	< 25	< 6	East Sunny
Aug-23 3rd FN	03/08/23-04/08/23	16-08-2023	16/08/23-22/08/23	173	78	38	< 25	< 6	East Cloud
Aug-23 4th FN	18/08/23-19/08/23	01-09-2023	01/09/23-09/09/23	185	76	37	< 25	< 6	East Cloud
Sep-23 5th FN	03/09/23-04/09/23	18-09-2023	18/09/23-20/09/23	122	63	31	< 25	< 6	East Sunny
Sep-23 6th FN	20/09/23-21/09/23	03-10-2023	03/10/23-11/10/23	185	82	42	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

Analysed By

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**TEST REPORT**

09/23 Test Report No. 2216	Job No. 094323120	Year	FY2023-24
Type of Sample:	Noise	Quarter Ending	Sep-23
Customer	CCL		
Testing/ Sampling Protocol:	'The noise pollution (Regulation and Control), Rules,2000, LQR 34		
Remarks:			

TEST RESULT

The sample has been tested with the following results: -

Area : North Karanpura **Project:** Dakra OCP

Station Name	Noise Level dB(A) Leq					
	Jul-23 1st FN	Jul-23 2nd FN	Aug-23 3rd FN	Aug-23 4th FN	Sep-23 5th FN	Sep-23 6th FN
	Day/Night	Day/Night	Day/Night	Day/Night	Day/Night	Day/Night
Date of recording	04-07-2023	18-07-2023	02-08-2023	17-08-2023	02-09-2023	19-09-2023
1. P.O.Office	68.7/62.5	69.3/63.4	69.5/63.2	70.6/64.7	68.9/62.5	70.2/64.3
Date of recording	04-07-2023	18-07-2023	02-08-2023	17-08-2023	02-09-2023	19-09-2023
2. Mohan Nagar Colony	65.8/59.6	66.6/60.5	66.7/60.8	68.3/62.5	65.7/59.6	67.6/61.5

Ambient Air Quality Standards in respect of Noise as per 'The noise pollution (Regulation and Control), Rules,2000		
Time Frame	Limits in dB(A) Leq	
	Day Time 6.00 AM to 10.00 PM	Night Time 10.00 PM to 6.00 AM
Industrial Area	75	70
Commercial Area	65	55
Residential area	55	45
Silence Zone	50	40

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TEST REPORT

09/23 Test Report No. 2217	Job No. 094323120	Year	FY2023-24
Type of Sample:	Effluent Water	Quarter Ending	Sep-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	MOEF -SCH-VI STANDARDS, Class 'A', LQR 33		
Remarks & Observation:	Samples received in 5 ltrs plastic Jerri cane, Colour as observed is transparent		

TEST RESULT

The sample has been tested with the following results: -

Area : North Karanpura **Project:** Dakra OCP **Stations:** Mine Lagoon Discharge

Analysis Results of FN Effluent Water							
Parameters →				COD	O & G	pH value	TSS
Detection Limit				4	2	0.2	10
MOEF -SCH-VI, STANDARDS, Class 'A'				250	10	5.5 to 9.0	100
Month	Date of Sampling	Date of Receipt of Sample	Date of Analysis	Value in mg/l, except pH			
Jul-23 1st FN	05/07/23-06/07/23	17/07/23	17/07/23-31/07/23	24	<2.00	8.2	61
Jul-23 2nd FN	19/07/23-20/07/23	01/08/23	01/08/23-14/08/23	16	<2.00	7	47
Aug-23 3rd FN	03/08/23-04/08/23	16/08/23	16/08/23-31/08/23	12	<2.00	7.9	54
Aug-23 4th FN	18/08/23-19/08/23	01/09/23	01/09/23-15/09/23	20	<2.00	7.4	54
Sep-23 5th FN	03/09/23-04/09/23	18/09/23	18/09/23-29/09/23	16	<2.00	7.9	46
Sep-23 6th FN	20/09/23-21/09/23	03/10/23	03/10/23-13/10/23	20	<2.00	7.2	50
BIS Standard & Method				APHA, 23rd Edition, Closed Reflux, Titrimetric Method, 2017	IS 3025/39:1991, R : 2003, Partition Gravimetric	IS-3025/11:1983, R-1996, Electrometric	IS 3025/17:1984, R :1996, Gravimetric Method

*The Environment (Protection)Rule,1986, Schedule-VI (General Standards for Discharge of Environmental Pollutants Part-A: Effluent)

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TEST REPORT

06/23 Test Report No. Metal / 03		Job No 094322160	2023-24
Type of Sample	Ambient Air	Quarter Ending	June' 2023
Customer	CCL	Date of Receipt of Sample:	17/04/2023
Mode of Receipt of Sample:	Joint sampling with customer	Date of Analysis:	01/06/23-14/07/23
Sampling Protocol:	USEPA IO-3.2: 1999, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area :	North Karanpura	Project:	Dakra OCP
Stations:	1. P.O.Office 2. Mohan nagar colony 3. Nehru Stadium 4. Workshop		Date of Sampling: 04-05/04/2023 04-05/04/2023 05-06/04/2023 05-06/04/2023

S.No	Test Parameters	Units	Test Result				Method detection Limit	Limit (NAAQS-2011)	Test Method
			1	2	3	4			
Stations:									
1	Conc. of As in Air	ng/m ³	0.83	0.19	0.36	1.87	0.1	6.00	USEPA IO-3.2:1999
2	Conc. of Ni in Air	ng/m ³	0.63	0.72	0.61	1.47	0.1	20.00	USEPA IO-3.2:1999
3	Conc. of Pb in Air	µg/m ³	0.013	0.013	0.012	0.016	0.005	1.0	USEPA IO-3.2: 1999
4	Conc. of Cu in Air	ng/m ³	0.25	0.19	0.21	0.29	0.1	-	USEPA IO-3.2: 1999
5	Conc. of Cd in Air	ng/m ³	0.024	0.022	<0.02	0.034	0.02	-	USEPA IO-3.2: 1999
6	Conc. of Cr in Air	ng/m ³	0.21	0.12	0.22	0.22	0.1	-	USEPA IO-3.2: 1999
7	Conc. of Hg in Air	ng/m ³	<0.005	<0.005	<0.005	<0.005	0.005	-	USEPA IO-3.2: 1999



TEST REPORT

06/23 Test Report No. 2208	Job No. 094322160	Year	FY2023-24
Type of Sample	Ambient Air	Quarter Ending	June-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : North Karanpura **Project:** Dakra OCP **Stations:** P.O.Office

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters NAAQS (8 Hourly Average)			Wind Direction (from) & Weather
				Ammonia (in µg/m ³)	CO (in mg/m ³)	Ozone (in µg/m ³)	
Apr.'23 1st FN	04/04/23	04/04/23	04/04/23	<20	0.465	<19.62	E to W
Apr.'23 2nd FN	18/04/23	18/04/23	18/04/23	<20	0.584	<19.62	E to W
May'23 3rd FN	03/05/23	03/05/23	03/05/23	<20	0.518	<19.62	E to W
May'23 4th FN	17/05/23	17/05/23	17/05/23	<20	0.451	<19.62	E to W
June'23 5th FN	02/06/23	02/06/23	02/06/23	<20	0.473	<19.62	E to W
June'23 6th FN	17/06/23	17/06/23	17/06/23	<20	0.556	<19.62	E to W

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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**TEST REPORT**

06/23 Test Report No. 2209	Job No. 094322160	Year	FY2023-24
Type of Sample	Ambient Air	Quarter Ending	June-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : North Karanpura **Project:** Dakra OCP **Stations:** Mohan Nagar Colony

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters NAAQS (8 Hourly Average)			Wind Direction (from) & Weather
				Ammonia (in $\mu\text{g}/\text{m}^3$)	CO (in mg/m^3)	Ozone (in $\mu\text{g}/\text{m}^3$)	
Apr.'23 1st FN	04/04/23	04/04/23	04/04/23	<20	0.402	<19.62	E to W
Apr.'23 2nd FN	18/04/23	18/04/23	18/04/23	<20	0.429	<19.62	E to W
May'23 3rd FN	03/05/23	03/05/23	03/05/23	<20	0.484	<19.62	E to W
May'23 4th FN	17/05/23	17/05/23	17/05/23	<20	0.365	<19.62	E to W
June'23 5th FN	02/06/23	02/06/23	02/06/23	<20	0.501	<19.62	E to W
June'23 6th FN	17/06/23	17/06/23	17/06/23	<20	0.479	<19.62	E to W

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

06/23 Test Report No. 2210	Job No. 094322160	Year	FY2023-24
Type of Sample	Ambient Air	Quarter Ending	June-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : North Karanpura

Project: Dakra OCP

Stations: Nehru Stadium

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters NAAQS (8 Hourly Average)			Wind Direction (from) & Weather
				Ammonia (in $\mu\text{g}/\text{m}^3$)	CO (in mg/m^3)	Ozone (in $\mu\text{g}/\text{m}^3$)	
Apr.'23 1st FN	05/04/23	05/04/23	05/04/23	<20	0.364	<19.62	E to W
Apr.'23 2nd FN	19/04/23	19/04/23	19/04/23	<20	0.425	<19.62	E to W
May'23 3rd FN	04/05/23	04/05/23	04/05/23	<20	0.439	<19.62	E to W
May'23 4th FN	18/05/23	18/05/23	18/05/23	<20	0.307	<19.62	E to W
June'23 5th FN	03/06/23	03/06/23	03/06/23	<20	0.384	<19.62	E to W
June'23 6th FN	18/06/23	18/06/23	18/06/23	<20	0.466	<19.62	E to W

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

06/23 Test Report No. 2211	Job No. 094322160	Year	FY2023-24
Type of Sample	Ambient Air	Quarter Ending	June-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : North Karanpura **Project:** Dakra OCP **Stations:** Workshop

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters NAAQS (8 Hourly Average)			Wind Direction (from) & Weather
				Ammonia (in $\mu\text{g}/\text{m}^3$)	CO (in mg/m^3)	Ozone (in $\mu\text{g}/\text{m}^3$)	
Apr.'23 1st FN	04/01/23	04/01/23	04/01/23	<20	0.523	<19.62	E to W
Apr.'23 2nd FN	19/04/23	19/04/23	19/04/23	<20	0.569	<19.62	E to W
May'23 3rd FN	04/05/23	04/05/23	04/05/23	<20	0.488	<19.62	E to W
May'23 4th FN	18/05/23	18/05/23	18/05/23	<20	0.401	<19.62	E to W
June'23 5th FN	03/06/23	03/06/23	03/06/23	<20	0.438	<19.62	E to W
June'23 6th FN	18/06/23	18/06/23	18/06/23	<20	0.472	<19.62	E to W

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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TEST REPORT

06/23 Test Report No. 2212	Job No. 094322160	Year	FY2023-24
Type of Sample	Ambient Air	Quarter Ending	Jun-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : North Karanpura **Project:** Dakra OCP **Stations:** P.O.Office

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter ($\text{PM}_{10} + >\text{PM}_{10}$)TPM	Particulate Matter (PM_{10})	Particulate Matter ($\text{PM}_{2.5}$)	Sulphur Dioxide (SO_2)	Nitrogen Oxides (as NO_x)	
Apr-23 1st FN	04/04/23-05/04/23	17-04-2023	17/04/23-22/04/23	383	199	63	< 25	< 6	East Sunny
Apr-23 2nd FN	18/04/23-19/04/23	02-05-2023	02/05/23-09/05/23	172	90	44	< 25	< 6	East Sunny
May-23 3rd FN	03/05/23-04/05/23	16-05-2023	16/05/23-22/05/23	201	117	53	< 25	< 6	East Sunny
May-23 4th FN	17/05/23-18/05/23	01-06-2023	01/06/23-09/06/23	288	132	69	< 25	< 6	East Sunny
Jun-23 5th FN	02/06/23-03/06/23	16-06-2023	16/06/23-21/06/23	212	89	40	< 25	< 6	East Sunny
Jun-23 6th FN	17/06/23-18/06/23	03-07-2023	03/07/23-07/07/23	184	76	37	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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**TEST REPORT**

06/23 Test Report No. 2213	Job No. 094322160	Year	FY2023-24
Type of Sample	Ambient Air	Quarter Ending	Jun-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : North Karanpura **Project:** Dakra OCP **Stations:** Mohan Nagar Colony

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter ($\text{PM}_{10} + >\text{PM}_{10}$)TPM	Particulate Matter (PM_{10})	Particulate Matter ($\text{PM}_{2.5}$)	Sulphur Dioxide (SO_2)	Nitrogen Oxides (as NO_x)	
Apr-23 1st FN	04/04/23-05/04/23	17-04-2023	17/04/23-22/04/23	236	76	53	< 25	< 6	East Sunny
Apr-23 2nd FN	18/04/23-19/04/23	02-05-2023	02/05/23-09/05/23	157	75	31	< 25	< 6	East Sunny
May-23 3rd FN	03/05/23-04/05/23	16-05-2023	16/05/23-22/05/23	128	58	24	< 25	< 6	East Sunny
May-23 4th FN	17/05/23-18/05/23	01-06-2023	01/06/23-09/06/23	216	92	50	< 25	< 6	East Sunny
Jun-23 5th FN	02/06/23-03/06/23	16-06-2023	16/06/23-21/06/23	121	56	22	< 25	< 6	East Sunny
Jun-23 6th FN	17/06/23-18/06/23	03-07-2023	03/07/23-07/07/23	136	62	30	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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**TEST REPORT**

06/23 Test Report No. 2214	Job No. 094322160	Year	FY2023-24
Type of Sample	Ambient Air	Quarter Ending	Jun-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : North Karanpura **Project:** Dakra OCP **Stations:** Nehru Stadium

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter ($\text{PM}_{10} + >\text{PM}_{10}$)TPM	Particulate Matter (PM_{10})	Particulate Matter ($\text{PM}_{2.5}$)	Sulphur Dioxide (SO_2)	Nitrogen Oxides (as NO_x)	
Apr-23 1st FN	05/04/23-06/04/23	17-04-2023	17/04/23-22/04/23	173	65	35	< 25	< 6	East Sunny
Apr-23 2nd FN	19/04/23-20/04/23	02-05-2023	02/05/23-09/05/23	171	82	38	< 25	< 6	East Sunny
May-23 3rd FN	04/05/23-05/05/23	16-05-2023	16/05/23-22/05/23	138	64	33	< 25	< 6	East Sunny
May-23 4th FN	18/05/23-19/05/23	01-06-2023	01/06/23-09/06/23	308	122	64	< 25	< 6	East Sunny
Jun-23 5th FN	03/06/23-04/06/23	16-06-2023	16/06/23-21/06/23	138	63	31	< 25	< 6	East Sunny
Jun-23 6th FN	18/06/23-19/06/23	03-07-2023	03/07/23-07/07/23	104	59	25	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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**TEST REPORT**

06/23 Test Report No. 2215	Job No. 094322160	Year	FY2023-24
Type of Sample	Ambient Air	Quarter Ending	Jun-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	IS 5182 (part 14): 2000 ,R -2010, Methods for Measurement of Air Pollution, LQR 32		
Remarks & Observation:	All samplers placed 1.5 m above ground level		

TEST RESULT

The sample has been tested with the following results: -

Area : North Karanpura **Project:** Dakra OCP **Stations:** Workshop

Month	Date of Sampling	Date of receipt of sample	Date of analysis	Parameters (in $\mu\text{g}/\text{m}^3$)					Wind Direction (from) & Weather
				Total Particulate Matter ($\text{PM}_{10} + >\text{PM}_{10}$)TPM	Particulate Matter (PM_{10})	Particulate Matter ($\text{PM}_{2.5}$)	Sulphur Dioxide (SO_2)	Nitrogen Oxides (as NO_x)	
Apr-23 1st FN	05/04/23-06/04/23	17-04-2023	17/04/23-22/04/23	463	240	78	< 25	< 6	East Sunny
Apr-23 2nd FN	19/04/23-20/04/23	02-05-2023	02/05/23-09/05/23	127	67	23	< 25	< 6	East Sunny
May-23 3rd FN	04/05/23-05/05/23	16-05-2023	16/05/23-22/05/23	176	81	41	< 25	< 6	East Sunny
May-23 4th FN	18/05/23-19/05/23	01-06-2023	01/06/23-09/06/23	177	78	32	< 25	< 6	East Sunny
Jun-23 5th FN	03/06/23-04/06/23	16-06-2023	16/06/23-21/06/23	152	74	36	< 25	< 6	East Sunny
Jun-23 6th FN	18/06/23-19/06/23	03-07-2023	03/07/23-07/07/23	238	86	44	< 25	< 6	East Sunny

Note:

1. Gazette Notification No. G.S.R 742(E) dt.25th Sept.'2000 is applicable in core zone.
2. Gazette Notification No. G.S.R 826 (E) dt.Nov.'2009 is applicable in buffer zone.

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**TEST REPORT**

06/23 Test Report No. 2216	Job No. 094322160	Year	FY2023-24
Type of Sample:	Noise	Quarter Ending	Jun-23
Customer	CCL		
Testing/ Sampling Protocol:	'The noise pollution (Regulation and Control), Rules,2000, LQR 34		
Remarks:			

TEST RESULT

The sample has been tested with the following results: -

Area : North Karanpura **Project:** Dakra OCP

Station Name	Noise Level dB(A) Leq					
	Apr-23 1st FN	Apr-23 2nd FN	May-23 3rd FN	May-23 4th FN	Jun-23 5th FN	Jun-23 6th FN
	Day/Night	Day/Night	Day/Night	Day/Night	Day/Night	Day/Night
Date of recording	04-04-2023	18-04-2023	03-05-2023	17-05-2023	02-06-2023	17-06-2023
1. P.O.Office	70.2/64.1	71.3/65.4	70.3/64.5	70.5/64.2	69.9/63.8	69.7/63.8
Date of recording	04-04-2023	18-04-2023	03-05-2023	17-05-2023	02-06-2023	17-06-2023
2. Mohan Nagar Colony	67.3/61.4	68.4/62.5	67.6/61.7	67.6/61.4	67.6/61.5	67.6/61.5

Ambient Air Quality Standards in respect of Noise as per 'The noise pollution (Regulation and Control), Rules,2000		
Time Frame	Limits in dB(A) Leq	
	Day Time 6.00 AM to 10.00 PM	Night Time 10.00 PM to 6.00 AM
Industrial Area	75	70
Commercial Area	65	55
Residential area	55	45
Silence Zone	50	40

Analysed By

Authorized Signatory

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TEST REPORT

06/23 Test Report No. 2217	Job No. 094322160	Year	FY2023-24
Type of Sample:	Effluent Water	Quarter Ending	Jun-23
Customer	CCL		
Mode of Receipt of Sample:	Joint sampling with customer		
Testing/ Sampling Protocol:	MOEF -SCH-VI STANDARDS, Class 'A', LQR 33		
Remarks & Observation:	Samples received in 5 ltrs plastic Jerri cane, Colour as observed is transparent		

TEST RESULT

The sample has been tested with the following results: -

Area : North Karanpura **Project:** Dakra OCP **Stations:** Mine Lagoon Discharge

Analysis Results of FN Effluent Water							
Parameters →				COD	O & G	pH value	TSS
Detection Limit				4	2	0.2	10
MOEF -SCH-VI, STANDARDS, Class 'A'				250	10	5.5 to 9.0	100
Month	Date of Sampling	Date of Receipt of Sample	Date of Analysis	Value in mg/l, except pH			
Apr-23 1st FN	08/04/23	17/04/23	17/04/23-28/04/23	16	<2.00	7.7	41
Apr-23 2nd FN	22/04/23	02/04/23	02/04/23-15/05/23	16	<2.00	8	34
May-23 3rd FN	07/05/23	16/05/23	16/05/23-31/05/23	16	<2.00	7.8	30
May-23 4th FN	21/05/23	01/06/23	01/06/23-15/06/23	20	<2.00	7.9	41
Jun-23 5th FN	06/06/23	16/06/23	16/06/23-30/06/23	28	<2.00	7.9	76
Jun-23 6th FN	21/06/23	03/07/23	03/07/23-14/07/23	24	<2.00	8.1	68
BIS Standard & Method				APHA, 23rd Edition, Closed Reflux, Titrimetric Method, 2017	IS 3025/39:1991, R : 2003, Partition Gravimetric	IS-3025/11:1983, R-1996, Electrometric	IS 3025/17:1984, R :1996, Gravimetric Method

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