



MCL

MAHANADI COALFIELDS LIMITED

(A Subsidiary of Coal India Limited)

‘Swachh Parivesh’

Showcasing

Best Environmental Practices in MCL

BEST ENVIRONMENTAL PRACTICES IN MCL

- Blast-free and Eco-Friendly coal extraction by **Surface Miners**
- Blast-free removal of OB with **Xcentric Ripper**
- **Plantation** for enhancing green cover
- Promoting/diversification into **renewable energy** like solar power plant
- **Carbon offset** by promoting renewable energy, plantation and surface miners etc.,
- **Air** quality monitoring and pollution control measures
- **Water** quality monitoring and pollution control measures
- Development of **nurseries, fruit orchards, and mine eco-parks**
- **Mine water utilization** for domestic purposes by the communities

BLAST-FREE AND ECO-FRIENDLY COAL MINING WITH SURFACE MINERS



AT LAKHANPUR OCP

TOTAL SURFACE MINERS - 67 nos.

Procured - 23 nos.

Hiring - 44 nos.

INVESTMENT (23 nos.) – Rs. 92 Cr.

Specifications:

Make: PUZZALANA

Model: PMM 2205

Drum width : 400 mm

Size of the product (coal) : 100mm

Rated productivity : 600 cum/hr

Dust suppression system incorporated

BLAST-FREE EXTRACTION OF OB WITH XCENTRIC RIPPER



Model	Units	BR -40	
Applicable Excavator	Ton	30-36	
Frequency	Vpm	1800	
Setting Pressure	Kg/Cm ²	250	
	Psi	3556	
Required Oil Quantity	l/min	180-210	
	Gpm	47.5-55.5	
Dimension	Height	In	115
		mm	2920
	Length	In	62.4
		mm	1584
	Width	In	33.7
		mm	855
	Tooth	In	18.5
		mm	470
Body Weight (Including Bracket)	Lb	7474	
	Kg	3390	

Total estimated cost Rs. 6,49,73,300.00 for extraction of 14,14,000 cum of OB for three years starting from 05.02.21

BR 40 deployed one each at Hingula OCP and Kaniha OCP

PLANTATION IN MCL (SINCE INCEPTION)

Sl. No	Location	Plantation Area (in Ha)	No. of Saplings
1	IB Coalfields	1206.95	3161185
2	Talcher Coalfields	924.26	2278309
3	Outside*	424.20	711889
	Total	2555.41	6151383

*Includes plantation on Govt. land and MCL Headquarters

Carbon sink created @ 50te CO_{2eq} absorption/Ha of plantation = **1,27,770.5 te CO_{2eq}**

VRIKSHAROPAN ABHIYAN 2021 IN MCL



Plantation by
CMD, MCL

- Under the guidance of MoC, Vrikshyaropan Abhiyan was celebrated in MCL on 19.08.2021 in different mining areas including HQ.
- Out of total 60 no. of plantation sites, 19 nos. have been connected with MoC in a virtual platform and symbolic plantation was held in additional 41 no. of sites.
- Total nos. of plantations done was 24600 and 40000 nos. of saplings were distributed.
- Laying of foundation stone of Chandra Shekhar Azad Orient UG Mine No.4 Eco Park was carried out in virtual mode, by Shri Pralhad Joshi, Hon'ble MoC, Mines and Parliamentary Affairs, GoI, in presence of Shri Raosaheb Patil Danve, Hon'ble MoS Coal, Mines and Railways, GoI.



CARBON OFFSET CREATED

Sl. No	Activity	Carbon Offset Created till 31.03.2021 (in te CO ₂ eq)
1	Coal production by Surface Miners (67 Nos.)	1,65,420.06
2	2 MW Solar plant	2,995.920
3	Energy efficient LEDs (12965 Nos)	16,546.224
4	5 star 1.5 ton split AC's (472 Nos), 2 ton split AC's (187 Nos), Window AC's (37 Nos)	986.58
5	Energy efficient super fans (1824 Nos)	87.907
6	Plantation in MCL (since inception)	1,27,770.5
	Total	3,13,807.2

AIR QUALITY MONITORING AND POLLUTION CONTROL MEASURES

Switching from conventional pollution control measures to advanced dust suppression techniques

▪ Air quality monitoring

Apart from regular air quality monitoring, MCL has installed eleven (12) nos. of Continuous Ambient Air Quality Monitoring System (CAAQMS) in three clusters namely Talcher C.F (05 nos.), Ib Valley C.F (04 nos.) and Basundhara C.F (03 nos.) in consultation with RO, OSPCB.

▪ Air pollution control measures

- Truck mounted fog cannons (40m throw)
- Trolley mounted fog cannons (100m throw)
- Fixed type sprinklers/ Fixed mist type sprinklers
- Mechanical Road Sweepers
- Robotic nozzle
- 28 KL multi-utility water tanker
- First Mile Connectivity (FMC), Rapid Silo Loading, Coal Corridors
- Wheel washing system
- Instant shower system
- Wind barrier/vertical greenery

CONTINUOUS AMBIENT AIR QUALITY MONITORING SYSTEM (CAAQMS)



IN OPERATION – 12 Nos.
Ib Coalfields – 5 Nos.
Basundhara Coalfields – 3 nos.
Talcher Coalfields – 4 nos.

INVESTMENT – Rs. 7.15 Cr.

MAINTENANCE COST – Rs. 10.07 Cr. for 7 years

At Lajkura OCP

TRUCK MOUNTED FOG CANNONS (40M THROW)



At Lakhanpur OCP



At Kaniha OCP

Specifications:

- 40 M throw
- 5 Kw Pump
- 15 Bar Operating Pressure
- 7.5 Kw Blower fan
- 25 KVA DG set
- 12 KL water tank
- 10 wheel mounted

- **TOTAL IN OPERATION – 18 Nos.**
- **ESTIMATED COST – Rs. 28.03 Crore for 3 years**
- **IB Valley Coalfields - 10 Nos.**
- **Talcher Coalfields - 08 Nos.**

TROLLEY MOUNTED FOG CANNONS (100 M THROW)



At Siding No. 6 & 7 of Lakhanpur Area

Specifications

- 100M throw
- 37 kw Blower fan
- 10 kw pump
- Electric Powered
- Droplet Size – 30 to 40 micron
- H. Swing – 0 to 320 degree
- V. Swing – 0 to 45 degree

Ib Valley Coalfields - 49 Nos.
Talcher Coalfields - 48 Nos.

- Total - 97 Nos.
- Estimated Cost – Rs. 9.66 Crore
- In Operation – 58 Nos.
- To be Installed- 24 Nos.
- Under Procurement – 15 Nos.

MECHANICAL ROAD SWEEPER



Sweeping speed: upto 10 km/hr # Size of debris it can handle: 100 mm
 # Sweeping width: 1.8 m (min) and 3.0 m (max) # Sweeping rate : 30000 Sq. m/hr

PROCUREMENT BASIS

- **IN OPERATION – 4 Nos.**
- **INVESTMENT – Rs. 1.85 Cr.**

HIRING BASIS

- **Total Proposed - 14 Nos.**
- **Estimated Cost – Rs. 13.81 Cr.**
- **In Operation - 2 Nos.**
- **Tender floated - 12 Nos.**

- For collecting dust on coal corridors, other pucca type transport roads, public roads etc.

ROBOTIC NOZZLE RETRO-FITTED ON 28KL WATER SPRINKLER



- Jet Throw – 60 meter
- Operating Pressure – 10-15 bar
- Remote Wireless Operating Nozzle.
- Reduce Human risk Factor
- Spray Formation- cut off oxygen supply to fire
- Position feedback accuracy – 1/100 degree
- Minimum rotational speed – 25-30 degree/sec
- 50mm Internal Pipe diameter
- Water flow 500-600 GPM

- **Robotic Nozzle commissioned at Lakhanpur, Basundhara and Lingaraj mines**
- **In Operation - 3 Nos.**
- **Investment – Rs. 6 Cr.**
- Adjustable full cone and straight throw
- Suitable for all fire fighting and dust suppression needs.

28 KL MULTI-UTILITY WATER TANKER FOR FIREFIGHTING AND DUST SUPPRESSION



- EoI Floated , 7 companies participated.
- Budgetary offers received from M/s VOLVO and M/s IVECO, lowest offer at par with BEML 28 KL water tanker.
- Advantage : Tailor made for “off & on” the road application, Multi utility, Very less diesel consumption, coverage of entire road width in one go, more effective.
- Indents are under preparation.

FMC, RSL AND COAL CORRIDOR

- Construction of all weather haul roads of **11.41 km length** with an investment of **71.14 Cr.** to be completed by **31.10.2021.**
- Enhancing Mechanized Loading capacity by **additional 146 MTPA** with an investment of **2448 Cr.** by **2023-24.**
- Rail connectivity works under First Mile Connectivity with a length of **72.1 km** and investment of **1371 Cr.** by **Dec'22.**
- Construction of separate coal transport corridor with a length of **20.99 km** at an investment of **140.15 Cr.** in Talcher Coalfields and of **17.03 km** at an investment of **174.34 Cr** in Ib Valley Coalfields



WHEEL WASHING SYSTEM



- **TOTAL PROPOSED – 12 Nos.**
- **ESTIMATED COST – Rs. 4.36 Cr.**
- **IN OPERATION – 5 Nos**
- **Under Construction– 1 Nos.**
- **UNDER PROCESS – 6 Nos.**

Installed at mine exit points as a pro-active measure to prevent/reduce the dust transmission from mines to public roads/places.

DUST CONTROL MEASURES



Dedicated Coal Corridor –
Bhubaneswari
covers a length of 1.86 Km



Vertical greenery system
at siding no. 3 siding.
Lakhanpur Area



Wind barrier at siding no. 2, Samaleswari OCP

DEPARTMENTAL SAL NURSERY SET UP AT BASUNDHARA AREA



As per the advise of the EAC, Sal Plantation has been taken up in the Basundhara Area, a **Sal Nursery** has been developed in **2019** and **10,000 no. of saplings** have been developed till date.

PLANTATION OVER BACKFILLED OB DUMPS



South Balanda OCP



Lakhanpur OCP



Lajkura OCP



Ananta OCP

AVENUE PLANTATION AT LAKHANPUR OCP

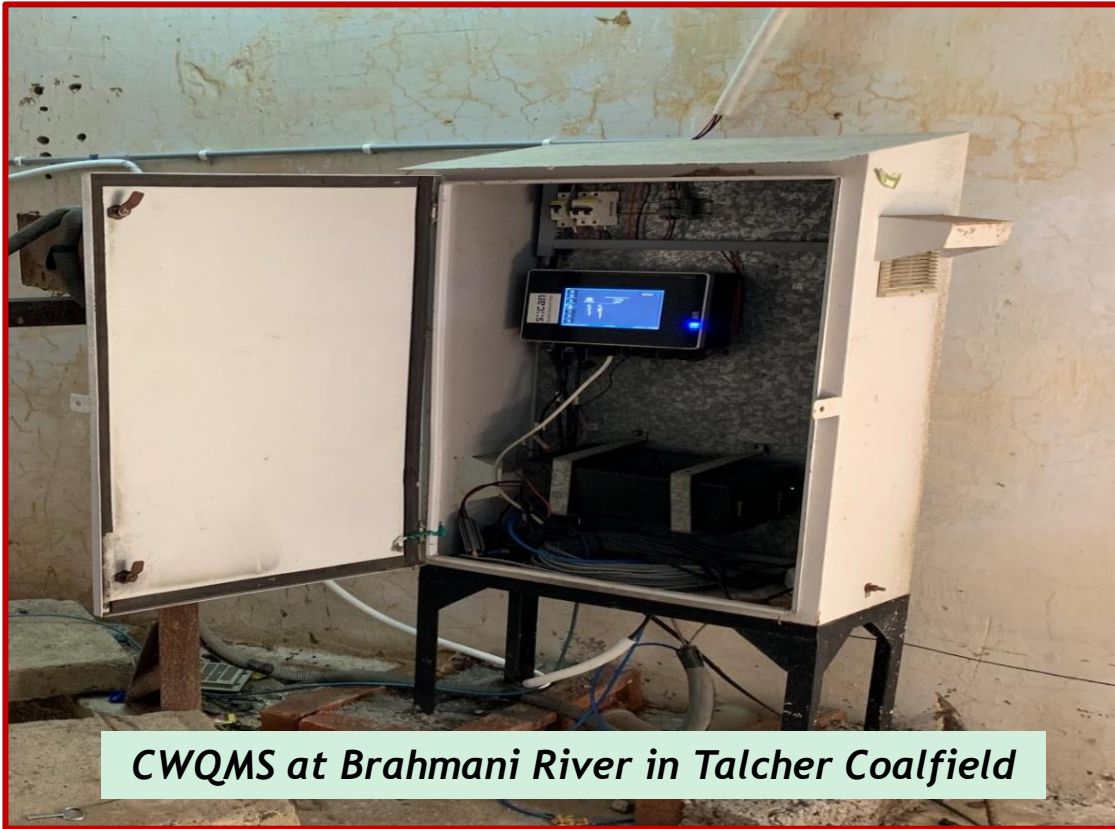


6.93 RKm



WATER QUALITY MONITORING AND POLLUTION CONTROL MEASURES

Continuous Water Quality Monitoring Stations (CWQMS) - 2 nos.



CWQMS at Brahmani River in Talcher Coalfield



CWQMS at Ib River in Ib Valley Coalfield

- CWQMS has been installed one each at Brahmani River in Talcher Coalfield and Ib River in Ib Valley Coalfield.
- Water quality data is sent real time to the server at State Pollution Control Board.

EFFLUENT TREATMENT PLANT (ETP)



- In Operation – 13 Nos.
- Investment – 5.85 Cr.
- Zero discharge to outside environment.
- The water after treatment is re-used in workshop.



ETP consists of:

- Oil and grease trap
- Chemical dosing unit
- Aeration tank
- Settling tank
- Clarifier tank
- Chlorination unit

At Jagannath OCP, Capacity 0.5 MLD

SEWAGE TREATMENT PLANT (STP)



- Total STP– 11 Nos.
- In Operation – 9 Nos.
- Under construction – 2 Nos.
- Investment : 14.12 Cr
- Domestic wastewater collected from colonies is treated in STP
- The water after treatment is used for plantation



LAKHANPUR OCP, (1.7 MLD) consists of

- Grit chamber
- Primary Sedimentation tank with pump house
- Aeration tank – 2 nos.
- Secondary clarifier
- Effluent settling tank
- Activated Carbon Filter
- Sludge drying bed – 2 nos.

MAHATMA GANDHI UDHYAN



AT BHUBANESWARI OCP



AT TALCHER AREA



- In the name **Mahatma Gandhi Udyans**, **05 no. of fruit orchards** at the mine locations i.e. near regional store of **Talcher Area**, backfilled area of **Bhubaneswari OCP**, backfilled area of **Balaram OCP**, backfilled area of **Basundhara West OCP** and at Tiklipada site of **Garjanbahal OCP** were inaugurated on **02-10-2020**.
- Total nos. of saplings planted - **5310 nos.** over an area of **10.65 Ha**.
- Plant Species - **Mango, Bel, Guava, Jamun, Coconut, and Amla etc.**

COMMUNITY ORGANIC FARMING ON INTERNAL BACKFILLED AREA

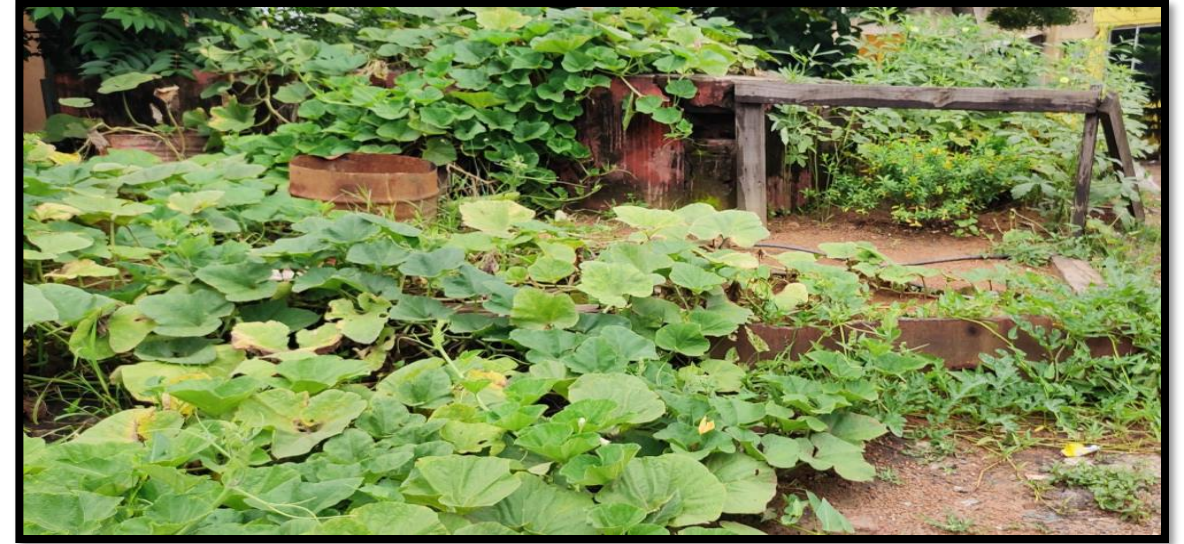


AT BHUBANESWARI OCP

Continued.....



SMALL GARDEN DEVELOPED AT WORKSHOP USING HEMM REJECTS



AT BHUBANESWARI OCP



APICULTURE AT TALCHER AREA



**10 no. of Honey Bee Hive Boxes
Installed at Various places of Talcher Area
Investment : 1.25 lakhs**

PLANTATION OF 28,000 SAPLINGS (17.5 HA) BY STATE FOREST DEPARTMENT UNDER CORPORATE SECTOR PLANTATION SCHEME DURING 2020-21



Plantation of 28,000 saplings (17.5 Ha) by State Forest Department under Corporate Sector Plantation scheme during 2020-21



Specie planted:Lemon, Sissoo, Karanj, Gambhari, Dhranj, Mango, Guava, Kadam, Amla, Jamun, Jackfruit, Ber, Peepal, Kaju, Pista, Custard Apple etc

DEVELOPMENT OF MINE ECO-PARKS – TO PROMOTE TOURISM

Sl. No	Name of Eco Park	Estimated Cost (Rs. Lakh)	Status
1	Lilari Eco Park (30 Ha)	168	Work commenced on 08.05.21, Scheduled finish is 01.02.22
2	Orient UG No.4 Eco Park (9.5 Ha)	189	Work commenced on 09.06.21, Scheduled finish is 04.12.21.
3	Balanda Eco Park (70.8 Ha)	2139	Work undertaken by NTPC on ash filled site. 1. 1m thick topsoil laying to be completed by 31.12.21 2. Plantation to be completed by 31.03.22 and maintenance till 31.03.24
4	Rani Park (242 Ha)		Feasibility Report under preparation

*Note: IIT Kharagpur is carrying out a feasibility study on Comprehensive Development of Talcher Coalfields” which includes the feasibility study of developing Rani Park. After submission of feasibility report by IIT Kharagpur, the same will be submitted to State Government for developing Rani Park as an Ecological Hub which is situated on Government Land. Subsequently, after further directives of State Government, necessary action will be taken.

Rani Park Area: 242 Ha; Work Undertaken on Deposit Basis to State Government (Boundary Wall, Box cell culverts, Hume pipe Culverts and Retaining Wall: Estimated Cost (Rs 14.91 Cr)- MCL Board Approved

- Likely Annual footfall: 60000 nos. (approximate): 15000 Nos each park
- Estimated number of local people likely to be engaged: 60 Nos. (15 Nos each)

PARK ON BALANDA OPEN CAST ABANDONED MINE



Drone captured top view of ash filled site
1m thick top soil laying in progress

MINE WATER UTILIZATION FOR DOMESTIC PURPOSES BY THE COMMUNITIES

PURPOSE	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	TOTAL
For Community use in lakh Cum							
Domestic	88	83	75	75	75	75	383
Irrigation	27	32	32	32	32	32	160
Total	115	115*	107**	107**	107**	107**	543

ACHIVEMENT DURING FY 2020-21

- **BENEFICIARIES DURING 2020-21: 137825 nos.**
- **IRRIGATED AREA: 75.4 Acres**

ROADMAP FOR EACH OF THE NEXT FIVE YEARS

- Total Planned Expenditure during 05 years: **Rs. 5.50 Cr**
- Total Villages to be covered in 05 years: **56 nos.**
- Total Beneficiaries of domestic/drinking water during 05 years: **110000 nos.**
- Total irrigable area to be covered in 05 years: **31 Ha**
- Estimated number of local people likely to be engaged: **30 nos.**

SUPPLY OF DRINKING WATER TO PERIPHERAL VILLAGES



LAKHANPUR AREA



PROMOTING/DIVERSIFICATION INTO SOLAR ENERGY



FY	Type of Solar Project	Nos. of such Projects	Total Installed Capacity (MW)	Capital (Rs. Crore)	Carbon offset Potential (Te)
2021-22	Roof Top	1	1.21	4.82	1812.53
2022-23	Ground Mounted	2	125 (50+75)	554.72	187245
2023-24	Ground Mounted	1	75	300.00	112347
TOTAL		4	201.21	859.54	301404.53

Ground Mounted Solar Power Plant (2MW), Anand Vihar, MCL, BURLA

- In Operation since 2014
- Area – 8 acres
- Investment – Rs. 13 Crores

CREATION OF LONGEST VERTICAL GARDEN



**Installation year 2019,
GM Office, Basundhara Area**



2021-1-9 11:09

Installation year 2021 , Longest Vertical Garden system with 13,000 planted pots of 200m length with with complete drip irrigation system, Basundhara Area colony.

OUR MOTTO IS PLASTIC FREE ENVIRONMENT



2095 Jute bags (5 kg, 10 kg, 15 Kg) distributed to the colony residents