वेस्टर्न कोलफील्ड्स लिमिटेड

Western Coalfields Limited

(A Subsidiary of Coal India Limited)

Office of the Area General Manager, Majri Area

P.O. Ruchna, Th. Bhadaowali, Dist. Chandrapur – 442505

संदर्भ संख्या/ Ref. No. वेकोलि/माक्षे/क्षेमक्ष/पर्यावरण/2023/254

दिनांक Date : 25.11.2023

प्रति,

Addl. Principal Chief Conservator of Forests,

पर्यावरण वन एवं जलवायु परिवर्तन मंत्रालय,

क्षेत्रीय कार्यालय (WCZ),

आठवा माला, ईस्ट विंग, न्यू प्रोफेशनल बिल्डिंग,

सिविल लाइन, नागपुर-440001, (महाराष्ट्र)

विषय: Six Monthly Report against compliance of conditions of Environmental Clearance for Expansion of New Majri UG to OC Mine of Majri Area, WCL (As on 30th September 2023)

संदर्भ: Environmental Clearance of New Majri UG to OC Mine vide letter no. F.11015/25/2008-IA.I(M) dt.01.01.2021

महोदय,

Please find enclosed herewith Six Monthly Report against compliance of conditions of Environmental Clearance for New Majri UG to OC Mine of Majri Area, WCL (As on 30th September 2023).

This is for your kind information and necessary action please.

धन्यवाद

भवदीय

क्षेत्रीय पर्यावरण अधिकारी (पर्यावरण), मजरी क्षेत्र

संलग्नक : यथोपरी

प्रतिलिपि :

- प्रादेशिक अधिकारी, महाराष्ट्र प्रदूषण नियंत्रण बोर्ड, प्रादेशिक कार्यालय, प्रथम तल, ऐरो सेंटर गोंड, नागपुर - 440 001
- क्षेत्रीय महाप्रबंधक, मजरी क्षेत्र
- महाप्रबंधक (पर्यावरण), वे.को.लि. मुख्यालय, नागपुर
- उपक्षेत्रीय प्रबंधक, न्यू मजरी उपक्षेत्र

WESTERN COALFIELDS LIMITED

MAJRI AREA

EXPANSION OF
NEW MAJRI UG TO OC MINE

3.00 MTY CAPACITY

SIX MONTHLY EC COMPLIANCE REPORT

AS ON 30TH SEPTEMBER 2023

WESTERN COALFIELDS LIMITED

ENVIRONMENTAL CLEARANCE COMPLIANCE REPORT

PART-I

Name of the project	**Expansion of New Majri UNDERGROUND to OPEN CAST COAL MINE**
Location and Address	Office of the Sub Area Manager, New Majri Sub Area, Majri Area, PO: Shivji Nagar, Tehsil: Bhadrawati, Dist: Chandrapur, Maharashtra
Address for correspondence	Office of the Sub Area Manager, New Majri Sub Area, Majri Area, PO: Shivji Nagar, Tehsil: Bhadrawati, Dist: Chandrapur, Maharashtra
MOEF's clearance letter no. & date	J-11015/25/2006-IA.I (M) 04.01.01.2021
Period of this report	As on 30th SEPTEMBER 2023
Date of last report submitted	29.05.2023
Date of commencement of project work	30.10.2015

STATUS OF LAND ACQUISITION:

Type of land	Required as per EMP (Ha)	Actual acquired (Ha) as on 30.09.2023
Forest	NIL	NIL
Agriculture	680.51	631.01
Other	25.77	24.30 (Govt. land) 24.50 (Inherited from New Majri UG)
Total	706.28	680.01
Land given to NHAI (for highway)		(-) 1.13 (Agriculture land)
Net Total		678.88

STATUS OF LEGAL COMPLIANCES:

A	Consent under Water (Prevention & Control of Pollution) Act	Consent to Operate granted by MPCB vide letter no. Format1.0/CAC/UAN No. MPCB-CONSENT-0000163649 / CR / 2309000846 Dt. 12.06.2023 valid upto 31.03.2024.
B	Consent under Water (Prevention & Control of Pollution) Cess Act	
C	Environment (Protection) Act	Env. Clearance obtained for 3.0 MTY vide letter no. J-11015/25/2006-IA.II(M) 04.01.01.2021
D	Forest (Conservation) Act	Tahsildar, Bhadrawati has informed vide letter no. KY/AE/Proju 1/2016/1172 dated 15.11.2016, the said land land of 3.48 Ha bearing survey no. 14, 19 & 20 is not forest land as per clarification given by RFO Bhadrawati and as such same is under revenue department i.e. it is Government land (Grazing land)

PART – II
STATUS OF ENVIRONMENT

AIR POLLUTION CONTROL:-

a. No. of ambient air monitoring stations: Four

b. Name of the locations —

1. NMDC Substation
2. Kuchna Colony
3. Pohola Magazine
4. Manager Office, New Majri UG to OC

C. Ambient air quality status for the parameters (Average 95% time weighted values):

Sl.No	Location	SPM	RPM	SO2	NOx
1)	NMDC Substation	The CMPDIL Monitoring report is enclosed for the period from April to September 2023.			
2)	Kuchna Colony				
3)	Pohola Magazine				
4)	Manager Office, New Majri UG to OC				

WATER POLLUTION CONTROL:

a. No. of stations and frequency of monitoring: Mining activities started from 30.10.2013 & there is no mine water discharge as of now, hence the water pollution monitoring reports will be provided once mine water discharge encountered for the mine

b. Description of locations: –

c. Average concentration of major pollutants prescribed by State Pollution Control Board (fig. in mg/l except pH):

Sl. No	Location	pH	BOD	COD	DO	TSS	O/G
1.	Mine water discharge	The CMPDIL Monitoring report is enclosed for the period from April to September 2023.					

NOISE POLLUTION CONTROL:

a. No. of noise monitoring stations :- Two

b. Description of location and dB(A) values:-

Sl. No	Location	Day	Night
1	Fan House, New Majri- II UG	The CMPDIL Monitoring report is enclosed for the period from April to September 2023.	
2	Colony		

PART-III

STATUS OF IMPLEMENTATION OF PROVISIONS OF EMP

LAND USE STATUS:-

Area reclaimed biologically: Nil

Sl. No	Particulars	As per EMP	01.04.2023 to 30.09.2023	Progressive
1.	Area excavated (Ha)	358.35	24.05	136.82
2.	OB removed (Mm³)	373.18	4.345 Incl. Top Soil	43.973 Incl. Top Soil
3.	Top soil removed (Mm³) *	Incl. in sl. no. 2	1.733	10.823
4A	OB backfilled (Mm³) in NMOC to OC Quarry	Nil	Nil	Nil
4B	OB backfilled (Mm³) in NM OC Quarry	306.73	2.613	10.182
5.	OB dumped (Mm³) Note: A (i) 6.48 RH Top Soil during 17th Year	43.459	Nil	21.643 Incl. Top Soil
6.	Area recovered for reclamation (physical reclamation)	Nil	Nil	Nil

* Status of Top Soil:

2015-16: Top Soil Dump (0.60 Mm³), Embankment (0.40 Mm³)
2016-17: Top Soil Dump (0.020 Mm3), Embankment (0.50 Mm3)
2017-18: Top Soil Dump (0.60 Mm3), Embankment (0.15 Mm3)
2018-19: Top Soil Dump (0.094 Mm3), Embankment (0.006 Mm3)
2019-20: Top Soil Dump (1.856897 Mm3)
2020-21: Top Soil Dump (2.25424 Mm3)
2021-22: Top Soil Dump (2.61 Mm3)
2022-23: Top Soil Dump (NIL)
OB removed is backfilled in NMOC Quarry (7.569 Mm3) as on 31.03.2023.
2023-24: Top Soil Dump (1.733 Mm3) i.e. Stocking in NMOC as on 30.09.2023
OB removed is backfilled in NMOC Quarry (2.613 Mm3) as on 30.09.2023

PRODUCTION:-

(i) Targeted Capacity: - 3.00 MTY (sanctioned capacity)
(ii) Present Capacity: - 0.587 MTY (Actual Coal production 23-24 as on 30.09.23)

AFFORESTATION : -

Sl.No	Location	01.04.2023 to 30.09.2023	Progressive
1.	OB Dumps & embankments	40,000	95,000
2.	Backfilled areas	Nil	Nil
3.	Other areas (Plain)	Nil	85,000
	Total	Nil	1,80,000

Area under plantation (Progressive): - 72.00 Ha

Species planted: Jamun, Amla, Neem, Karanj, Bamboo, Sirsi, Peltaform, Soled Siris, Sissoo, Gulmohar, Cassia

REHABILITATION & RESETTLEMENT :-

Sl.No	Particulars	Total
1.	No. of land oustees	576 (Agricultural Land of 576 farmers)
2.	No. of land oustees rehabilitated	–
3.	No. of PAPS/PAFS to be resettled	–
4.	No. of PAPS/PAFS resettled	–
5.	Area of new site (Ha)	–
6.	Status of development	–
7.	Civic amenities provided at new resettlement site	–

Organizational setup at project level:
(Name and designation of the personnel to be given)

1. Shri R.Arumugam
   Sub Area Manager

2. Shri Vel. Madhar
   Mine Manager

3. Shri M. Pandiyaraj
   SAE (Civil) / Nodal officer (Env)

EXPENDITURE :-

CAPITAL

Account head	01.04.2023 to 30.09.2023	Progressive
Reclamation (HEMM)	Nil	Nil
Air pollution control	Nil	Rs. 35.88 Lakhs
Water pollution control	Nil	Rs. 45.51 Lakhs
Others (Flowmeter, Water meter)	Rs 0.32 Lakhs	Rs 20.68 Lakhs

REVENUE

Account head	01.04.2023 to 30.09.2023	Progressive
Afforestation	Rs 95.48 Lakhs	Rs 270.40 Lakhs
Monitoring	Rs. 15.70 Lakhs	Rs 124.04 Lakhs
MPCB JVS	Nil	Rs 1.61 Lakhs
Statutory expenses	Rs. 0.88 Lakhs	Rs 219.58 Lakhs
Others		
Water pollution control	NIL	Rs 79.77 Lakhs
Air pollution control	NIL	Rs. 11.12 Lakhs
Rain water harvesting pond	Nil	Rs 7.62 Lakhs
Garland drain	Nil	Rs 4.37 Lakhs
Misc. works	NIL	Rs 6.45 Lakhs
CAAGWS AMC	NIL	Rs. 4.99 lakhs
Ground Water Abstraction Charges	NIL	Rs. 86.10 Lakhs

EC COMPLIANCE REPORT

Clearance letter No : J-11015/25/2008-IA.II(M)

Date : 1st January 2021

SP NO.	Condition	Compliance as on date
4(i)	The project proponent shall obtain consent to Establish/operate from the state pollution control boards for the proposed capacity of MTPA prior to commencement.	Consent to Operate has been obtained vide letter no. Format 1.0/CAC/UAN No. MPCB-CONSENT-0000160948 / CR / 2305000846 Dt. 12.05.2023 valid upto 31.03.2024 [Copy of CTO enclosed as Annexure 1]
(ii)	third party monitoring (by NEERI/CIMFR/IIT/NITs) for air quality shall be carried out at identified locations Both ambient and the process area, to arrive at impact of the proposed expansion at regular interval of 3 years.	Work of 3rd party monitoring for air quality is awarded to VNIT Nagpur vide Work Award letter no. WCL/NA/AGM/ENV/2023/167 dated 24.07.2023 for the period Oct 2023 to Sept 2024 i.e. within 3 years of grant of EC [Copy of Monitoring report enclosed]
(iii)	Top soil should be stored separately at marked area and necessary vegetation shall be maintained to avoid any entrainment of dust.	Top soil is being stored at designated Top Soil dump with an area of 23.30 Ha & 10.70 Ha & height of 45 mts & 38 mts resp. Grass seeding and Plantation is done to avoid fugitive dust from dump
(iv)	PP shall construct embankment leaving 100 mts away from HFL of Wardha river and the same shall be taken prior approval from DGMS	At present the mine working is being done more than 100 mts away from HFL of Wardha river Embankment will be constructed along Wardha River with adequate height and width to prevent mine from rise in water level during inundation in Wardha River. (as shown in PR/ EIA-EMP – refer enclosed "Surface and Quarry Layout Plan – plate VII of EIA-EMP" enclosed as annexure 2) However, at present, Embankment is constructed along the diverted Korad Nala [Length: 6.40 kms, Height: 10 mts, Width at top: 30 mts and width at bottom: 60 mts]
(v)	Transportation of coal from coal handling plant shall be through mechanized covered trucks for 3 years. No transportation by trucks after 3 years and proposed railway siding/pipe conveyor system.	Mechanically closed trucks are not provided by any truck maker for coal in India. However, tarpaulin covering is being ensured for all the coal transportation trucks. There is one common railway siding in WCL Majri Area

		Coal transportation outside mine is being done by Railways only.
(v)	All the villages coming under the zone of influence as in hydrology study shall be provided with suitable water supply along with sanitation facility	Due to availability of waterbodies such as Wardha River in South West, Shane Nala in North East and Kotad Nala in North West direction, there is no scarcity of water in the vicinity Water supply arrangements will be made for all the villages coming under zone of influence, if there is any water scarcity reported in any of the village
(vi)	Commitment made during public consultation process shall be adhere to. As proposed, Rs 299.46 Lakhs is earmarked shall be considered as part of Environment Management Plan, which shall be accomplished within period of 5 years.	The work of Rs 7.46 Lakhs for providing tubewell at Palogaon village is done under CSR Head as per the commitment made during public hearing. Work order and photographs of bore enclosed. Apart from this various activity to be covered under CER are also enclosed as Annexure 3. Few such activities such as Medical Camps, Health survey/ check-up, Skill Development training for people in nearby villages, development of roads, Rain Water Harvesting works, Avenue Plantation, providing saplings for plantation in nearby villages are being done. However, as the project is running/ already operational, works taken up in nearby village are accounted in CSR Head.
(vii)	Water quality and bioassay test of Wardha River shall be monitored quarterly and submitted to State Pollution Control Board. No water shall be discharged in river. Any deviation from limits as stipulated in norms by CPCB for quality shall be informed and necessary action shall be taken.	Surface Water quality and bioassay test of Wardha River is being monitored quarterly. (copy of Surface reports of the QE June 2023 & QE Sept 2023 and Bio Assay test report for the month Sept 2023 enclosed as annexure 4 & 5) Report of same is being submitted to MPCB, MOEF Regional offices along with six monthly EC Compliance report.
(ix)	Quarterly monitoring of quality of water from bore hole used for drinking purpose shall be conducted and report thereof shall be submitted to SPCB. Any deviation from limits as stipulated in norms by CPCB for quality shall be informed and necessary action shall be taken.	Drinking water monitoring is being done on quarterly basis through CMPDI. (copy of reports of the sampling of QE June 2023 & QE Sept 2023 enclosed as annexure 6) Report of same is being submitted to MPCB, MOEF Regional offices along with six monthly EC Compliance report.
(x)	Progressive backfilling of mine and progressive reclamation of dump shall be done	Backfilling of adjacent mine quarry is being done as per the mining plan. As on 30.09.2023 10,162 Mm3 Hard OB is

		backfilled in adjacent New Naja UA OC Mine quarry. To prevent the soil fertility, Top Soil dump 1 having area of 28.30 Ha is planted with 56,000 nos. and Top Soil dump 2 having area of 10.70 Ha is planted with 40,000 nos. sapling of mixed species. Also, grass seeding of species "Stylo Hamata" is also being spread over top soil and hard Oil Dump. Photographs of plantation enclosed as annexure 7.
(xi)	To control the production of dust at source, the crusher and in-pit belt conveyors shall be provided with mist type sprinklers. Permanent water sprinkler shall be installed instead to water sprinkling by water tankers on the haul road.	Mobile crushers are being provided with Mist Nozzles for dust suppression at source. Also, fixed sprinklers are provided at coal stockyards. Fog Cannon (3 nos.) of 100 mtrs throw are installed at Mobile crushers discharge point of CHP. 2 nos. Mobile Water tankers of 28 KL capacity and 1 no. 15 KL capacity are also deployed on haul road for dust suppression. Photographs of Air pollution control system enclosed as annexure 8.
(xii)	Mitigating measures shall be undertaken to control dust and other fugitive emissions all along the roads by providing sufficient fixed type water sprinklers. Adequate corrective measures shall be undertaken to control dust emissions, which would include mechanized sweeping, water sprinkling/mist spraying on haul roads and loading sites, long range mist/atomizing arrangement, wind barrier wall and vertical greenery system, green belt, dust suppression arrangement at loading and unloading points, etc.	30 nos. fixed sprinklers provided at coal transportation road. 12 nos. fixed sprinklers provided at coal stockyard. 3 nos. Fog cannon of 100 mtrs throw with 330 deg rotation. Mist spray arrangement in all mobile crushers. 1,80,000 nos. trees planted with more than 50 % survival rate as wind barrier and green belt between mine and Nagpuna & Patragoan villages. FY: 2016-17, Nos.: 20,000 Nos., Area (Ha): 8 Ha 2018-19, Nos.: 15,000 Nos., Area (Ha): 6 Ha 2019-20, Nos.: 15,000 Nos., Area (Ha): 6 Ha 2021-22, Nos.: 50,000 Nos., Area (Ha): 20 Ha 2022-23, Nos.: 40,000 Nos., Area (Ha): 16 Ha 2023-24, Nos.: 40,000 Nos., Area (Ha): 16 Ha

[xiii]	Continuous monitoring of occupational safety and other health hazards, and the corrective actions need to be ensured.	Regular PME of departmental as well as contractual worker is being done for Occupational and other health hazards. PME during Year 2022 of 91 Deptt. Worker and PME during Year 2022 of all new Contractual workers, PME/ PME details and record of medical camp is enclosed as annexure 9 & 10
[xiv]	The total industrial water demand (peak) in operation phase shall be met by utilising treated mine discharge water. If require, necessary arrangement shal be made to reuse treated water from STP&ETP to nearby IPP or coal washery for future coal washery by entering suitable agreement. No wastewater (treated or untreated) shall be discharged into the river or any other water body.	Water demand for fire-fighting, dust suppression etc is met through the mine discharge i.e. water pumped out from underground galleries only as there is no mine water sump in the mine due to seepage of water in underground galleries. STP effluent is being recycled for washing of HEMM. STP will be provided whenever the construction of colony for this mine started Photographs of water pollution control system enclosed as annexure 11
[xv]	Blasting effect on patata village should minimised by using latest technology and quarterly health survey shal be conducted by project proponent.	Controlled blasting is being done to minimize the effect of blasting on Patata village. Record of blast vibration monitoring enclosed as annexure 12 Health survey in the form of Medical Camp is also being done for nearby villages. Record of Year wise medical Camps enclosed as annexure 10. Moreover, no such complaint is received from any of nearby village.
[xvi]	PP shall take permission of state public works Department before the proposed diversion of Road. Road shall be considered as per PWD requirement and plantation of trees and street light shall be provided by project proponent.	At present there is no PWD road diverted for mine working. PWD Permission will be sought before the diversion of Patata – Majri Road. Plantation on both sides of the road will be done as per the recommended species under Avenue Plantation
[xvii]	STP for proposed colony shall be constructed within one year of implementation of colony	At present there is no colony in this project. STP will be provided whenever the colony will be constructed.
[xviii]	Toe wall of atleast 15 mts height should be constructed along the OB dump.	At present the minimum of 50 mts distance is kept between OB Dump and adjacent Nala. Also garlands drain

		and toe wall of h about 1.5 mts of OB material is constructed near the confluence point of nala. Toe wall of 1.5 mtrs height is difficult to be constructed as on one side of dumps there are seasonal Nala. However, TOE Wall/ Gabion Wall of adequate height will be constructed outside OB dump along Nala, wherever necessary.
(xix)	5 Fog canon shall be installed to reduce the impact of air pollution for nearby villages.	Fog cannons (3 nos.) of 100 mtrs throw with 320 deg rotation are installed at dust generating sources. Fog Cannon (1 nos.) installed on railway siding and (2 nos.) are in procurement stage at WCL HQ under centralised procurement. Further to prevent nearby villages from impact of air pollution, thick green belt over an area of 34 Ha with 85,000 nos. tree saplings planted till date and having width of 30 to 100 mtrs along boundary.
(xx)	Water storage ponds shall be constructed of appropriate depth in nearby villages in collaboration with Gram Panchayats.	As on date, requirement of water storage pond was not raised by any village. Due to availability of waterbodies such as Wardha River in South West, Shirna Nala in North East and Kanadi Nala in North West direction, there is no scarcity of water in the vicinity. Water storage pond will be constructed if any nearby village demand for the same.
(xxi)	Peripheral tree plantation of local species in nearby village in collaboration with Gram Panchayats. 3-tier plantation with atleast 50000 trees along the patela village and nearby villages wherein no R &R is proposed shall be done within 3 years.	85,000 nos. trees of native species over an area of 34 Ha as green belt/ wind barrier between mine and nearby villages (Pelasgaon, Naglone) is done till October 2021. 95,000 nos. trees planted over an area Of 38 Ha on Top Soil dump in 2021-22, 2022-23 and 2023-24
(xxii)	3-tier Green belt along the boundary should be developed on priority basis preferably within first 3 years.	85,000 nos. trees of native species over an area of 34 Ha as green belt/ wind barrier between mine and nearby villages (Pelasgaon, Naglone) are planted as on date on plain land. Once the trees will grow up or during the course of plantation, it will help in developing the environment where the

		shrubs, herbs, creepers of native species will grow and develop 3-tier plantation. 95,000 nos. over an area of 38 Ha is planted on Top Soil dump in FY 2021-22, 2022-23 and 2023-24 FY | Nos. | Area (Ha) 2016-17 | 20,000 Nos. | 8Ha 2018-19 | 15,000 Nos. | 6Ha 2019-20 | 15,000 Nos. | 6Ha 2021-22 | 50,000 Nos. | 20 Ha 2022-23 | 40,000 Nos. | 16 Ha 2023-24 | 40,000 Nos. | 16 Ha
(xiii)	Persons of nearby villages shall be given training on livelihood and skill development to make them employable.	Skill Development training is being organised regularly (such as Tailoring, Beauty Parlour, Computer education, Security Guard etc.) for persons living in nearby villages. Work order issued by WCL HQ vide no. WCL/HRD/Skill Dev/2022-23/14 dtd 27.06.2022 for skill development training via CIPET, FDCI, Ashok Leyland driver training institute, ARDC, CI skill development training centres enclosed as annexure-13
(xiv)	Drinking water supply shall be given to all villages coming under zone of influence by extraction of ground water.	Due to availability of waterbodies such as Wardha River in South West, Shiria Nala in North East and Kanadi Nala in North West direction, there is no scarcity of water in the vicinity. Drinking water facility will be provided in nearby villages whenever the water scarcity/ drinking water requirement problem noted.
(xv)	Active OB Dump should not be kept barren/open and should be covered by Temporary grass to avoid air born of particles.	Grass seeding is done over embankment, Top Soil dump & OB Dump
(xvi)	Project proponent to plant 150,000 nos. of native trees with broad leaves along the transportation route in three years to prevent the effect of air pollution. After completion of base plantation, Number of trees shall be duly endorsed from District Forest Officer.	Top soil Dump along the transportation route/ opposite to coal stockyard is planted with about 95,000 nos. trees. This will act as green vertical barrier and prevent dust/ fugitive emission along coal handling and transportation. Apart from this about 15,000 nos. plants planted at Avenue Plantation from Lima Shovel Chowk to railway Siding and from Lima Shovel chowk to NMDC office as well as in the premises of office infrastructure.

		85,000 nos. trees of native species over an area of 34 Ha as green belt/ wind barrier between mine and nearby villages. (Pitaagaon, Nagbirai) are planned as on done on plain land. 95,000 nos. over an area of 22 Ha is planned on Top Soil dump in FY 2021-22, 2022-23 & 2023-24 FY | Nos. | Area (Ha) 2016-17 | 20,000 Nos. | 8 Ha 2018-19 | 15,000 Nos. | 6 Ha 2019-20 | 15,000 Nos. | 6 Ha 2021-22 | 50,000 Nos. | 20 Ha 2022-23 | 40,000 Nos. | 16 Ha 2023-24 | 40,000 Nos. | 16 Ha Tree Plantation work is being undertaken by Madhya Pradesh Rajya Van Vikas Nigam Ltd.
(xxvii)	Project Proponent shall obtain blasting permission from DGMS for conducting mining operation near villages and also explore development of rock breaker of suitable capacity in the project to avoid blasting very near to villages. There shall be no damages caused to habitation/structures due to blasting activity.	Blasting permission is obtained from DGMS vide letter no. 11115/WZ/Nagpur Region No. II/Permy/2020/7041 dated 12.01.2021. Copy of same enclosed as annexure 14
(xxviii)	The project proponent shall complies with all the statutory requirements and judgment of Hon'ble Supreme Court dated the 2nd August 2017 in Writ petition (Civil) No.114 of 2014 in the matter of Common Cause versus Union of India and Ors. State Government shall ensure that the entire compensation levied, if any, for illegal mining paid by the project proponent through their respective Department in strict compliance of judgment of Hon'ble Supreme Court dated the 2nd August 2017 in writ petition (Civil) No. 114 of 2014 in the matter of common Cause versus Union of India and Ors.	There is no case of Illegal Mining in this area. CCTV and other surveillance monitoring is being ensured at places such as Coal stockyard, Weigh Bridge etc. mines. Further, as the mine is an open cast mining there is no possibility of illegal mining within the project area. Mining as per valid EC and CTO capacity is being done within the project area
(xxix)	Project Proponent shall obtain the necessary prior permission from the Central Ground Water Authority (CGWA) in case of intersecting the Ground water table.	CGWA NOC Obtained vide NOC no. CGWA/NOC/MIN/ORIG/2020/7125 dtd 09.01.2020 valid upto 08.01.2022. Renewal of same approved vide 63rd EAC Meeting. Copy of last CGWA NOC enclosed as annexure 15
(xxx)	Proponent shall appoint an Occupational Health Specialist for Regular and Periodical medical examination of the workers engaged in the Project and maintain records accordingly; also, Occupational Health	Complied. Regular and Periodical medical examination (PME and PME) of the workers (Departmental as well as

	check-ups for workers having some ailments like BP, diabetes, habitual smoking, etc. shall be undertaken once in six month and necessary remedial/ preventive measures taken accordingly. The Recommendations of National Institute for ensuring good occupational environment for mine workers shall be implemented. The prevention measure for burns, malaria and provision of anti-snake venom including all other paramedical safeguards may be ensured before initiating the mining activities.	contractual workers] has been undertaken at Majri Area Hospital of WCL. Area Hospital is headed by Chief Medical Officer. There is 1 No. PMF incharge and 1 No. PME co-incharge with appropriate medical qualification. There are five existing Doctors. In addition there is 1 No. PME Clerk and 2 Nos existing category workers. Details of PME/PME enclosed as annexure 7. The adequate facility and medicines for burns, malaria and anti-snake venom are available at Majri Area Hospital. Rescue Room and safety depot, is equipped with paramedical safeguards in case of emergency.
(xxxi)	Project Proponent shall follow the mitigation measures provided in office memorandum No 2-11013/57/2014-IA.II (M), dated 29October, 2014, titled "Impact of mining activities on Habitations-issue related to the mining Projects wherein Habitations and villages are the part of mine lease areas or Habitations and villages are surrounded by the mine lease area".	There is no habitation within the Project area. Further, with reference to the OM dtd. 29.10.2014, we have been practicing best mine practices such as providing catch drains, garland drain to check runoff from the dumps. Adequate rain water harvesting measures are also being taken in and around mine area to recharge the groundwater levels. Regular monitoring of ground water level is also being done in core and buffer zone of the mine. Illumination and sound level of the mine are being monitored regularly inside mine as well as at nearby habitation. Full grown patch of plantation are being used by nearby villagers for livestock grazing. Some plantation is also act as shelter for these livestock's during scorching summers. Vibration monitoring is also being done in nearby Ferdia village from time to time to ascertain the impact of blasting. Mobile water tankers are used for dust suppression on haul road and fixed sprinkler are provided for dust suppression on coal transportation road.
(xxxii)	The illumination and sound at night at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining	Illumination and sound survey at nearby habitation at night is being done regularly.

	operations. Habitations have a right for darkness and minimal noise levels at night. PPs must ensure that the biological clock of the villages is not disturbed by orienting the floodlights/ masts away from the villages and keeping the noise levels well within the prescribed limits for day light/ night hours.	It is ensured that the biological clock of the villages is not disturbed by orienting the floodlights/ masts away from the villages and keeping the noise levels well within the prescribed limits for day light/night hours.
[xxxiii]	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna spotted in the study area. Action plan for conservation of flora and fauna shall be implemented in consultation with the State Forest and Wildlife Department. A copy of action plan shall be submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office.	There is no endangered fauna & flora species observed during the biodiversity study in the study area
[xxxiv]	Hon'ble Supreme Court in an writ petition (s) Civil No. 114/2014,Common Cause vs Union of India & Ors vide its judgement dated 8th January, 2020 has directed the union of India to impose a condition in the mining lease and a similar condition in the environmental Clearance and the mining plan to the effect that the mining lease holder shall, after ceasing mining operations, undertake re-greening the mining area and any other area which may have been disturb due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc. Compliance of this condition after the mining activity is over at the cost of the mining lease holders/Project Proponent". The implementation report of the above solid condition shall be sent to the Regional Office of the MoEFCC.	Grass seeding of embankment is already been done. Grass seeding of top soil dump and OB dump is also being done. Further, to prevent the soil fertility of top soil stockpile at dumps, 35000 nos. of trees planted at top soil dump no.1. This will act as vertical green barrier for coal handling at stockyard and prevent soil erosion.
(xxxv)	PP shall submit mine closure report/activity of Talwasa OC (2.00 MTPA) and Dhorwasa OC (2.00 MTPA) and status to ministry regional office within six months.	Progressive mine closure plan is audited by NCDR (as third party auditing agency) and CCO team during 2020-21

Specific condition with respect area being in CRAs

(i)	CTE/CTO for the project shall be obtained from the SPCB as required under the Air (Prevention and control of pollution) Act,1981 and the water (Prevention of control of Pollution) Act,1974, and the SPCB shall follow the mechanism/protocol issued by the Ministry vide letter no.G-16017/35/2018	Consent to Operate for capacity 3 MTY has been obtained vide letter no. Format/ CAC/UAN No. MPCB-CONSENT-0000140448 / CR / 2303000846 Dt. 12.03.2023 valid upto 31.03.2024.

	CPA dated 24.10.2019 while issuing the CTE/CTO for the project, for improvement of environment of environmental quality in the area.	
(ii)	The green belt of at least 5-10 m width shall be developed in more than 40% of the total project area, mainly along the periphery of mine boundary, in downward wind direction, and along road sides etc. Selection of plant species shall be as per the CPCB guidelines in consultation with the State Forest Department.	Green belt in an area of about 34 ha and for the width of about 50-100 mts has been developed on Western boundary of mine between Mine and Naglone & Palagaon village. As on date 65,000 nos. trees of native species planted over an area of 34 Ha on plain land and 95,000 nos. over an area of 36 Ha on Top Soil Dump.
(iii)	In addition, the project proponent shall develop greenbelt outside the plant premises such as avenue plantation, plantation in vacant areas, social forestry etc.	Avenue/ Road side plantation is being done. About 15,000 nos. saplings planted as Avenue Plantation from Lima Shovel Chowk to railway Siding and from Lima Shovel chowk to NKUG office as well as in the premises of office infrastructure. Plants distribution to nearby villages (such as Majri, Visloni, Naglone, Pataia etc) as steps towards collaboration with nearby villages and increasing green cover in nearby village area
(iv)	Monitoring of compliance of EC condition may be submitted with third party audit every year.	Work for same is awarded to NEERI, Nagpur vide award letter no. WCL/HQ/ENV/16-17/73-81 dated 26.10.2021. NEERI team inspected and review the EC Compliances in the month of March 2022. Copy of report enclosed as annexure 1a
(v)	Fund allocation for Corporate Environment Responsibility (CER) which is atleast 2 times as per OM of 1st May 2014 may now be considered as 2 times of fund allocated on commitment made during public consultation process for incorporating in EIA-EMP for deliberation of EAC and item-wise details along with time bound action plan shall be prepared and submitted to the Ministry's Regional Office.	The provisions of PR are to be fulfilled for the works under CER. Majority of points under public consultation as related to employment. Both direct and in-direct employment is being generated due to the project. The work of Rs 7.48 Lakhs for providing tubewell at Palagaon village is done as per the commitment made during public hearing. Work order and photographs of same enclosed. Apart from this various activity to be covered under CER are also enclosed. Few such activities such as Medical Camps, Health survey/ checkup, Skill Development training for people in nearby villages, development of roads, Rain Water Harvesting works, Avenue Plantation providing saplings for

		plantation in nearby villages are being done
(vi)	Effective fugitive emission control measures should be imposed in the process, transportation, packing etc.	Complied. 12 nos. fixed sprinkles are provided to control fugitive emission from Coal stockyard 30 nos. fixed sprinkles provided to control fugitive emission on coal transportation road 2 nos. 25 KL and 2 nos. 15 KL Mobile water tankers are deployed on Coal transportation road and haul road 3 nos. mist cannon of 100 mts throw with 320 deg rotation installed at Crushers. 1 no. installed at Railway Siding and 2 nos. are in procurement stage at WCL HQ under Centralised Procurement Mist spray arrangement in all mobile crushers Grass seeding over embankment, green belt between mine OB dumps and mine boundary Tree plantation in Safety zone acts as green belt between mine and nearby village. Also plantation on top of dump acts as vertical green barrier between mine and Majri village.
(vii)	Transportation of materials by rail/ conveyor belt to be implemented with the implementation of stipulation given in EC.	All the coal from mine is dispatched through Rail mode as per Coal Supply Agreement with thermal power plants
(viii)	A detailed water harvesting plan may be submitted by the project proponent	Rain Water Harvesting Pond of dimension 88 mtr x 18 mtr x 1.20 m costing Rs 7.62 lakhs has been constructed by considering the long term benefits. It helps in augmenting ground water resources. Apart from this, roof top rain water harvesting system is also installed at various office buildings such as Area Hospital, Rescue room, GVTC, Coal testing lab etc Moreover, the galleries of old abandoned Underground mine (New Majri UG mine no. II) acts as a ground water recharge structure also.

		Photographs of rain water harvesting structures enclosed as annexure 17
[x]	In case domestic waste water generation is more than 10 KLD, the industry may install STP.	The domestic water requirement of the mine is very less. Only 5 KLD overhead tank is provided for canteen and washroom requirement of the office. Modular STP for mine premises will be provided for canteen and other domestic waste if the effluent generation exceeds 10 KLD.
[x]	Monitoring of compliance of EC conditions may be submitted with third party audit every year	Monitoring of compliance of EC conditions is being done by NEERI every year. Report of same is enclosed as annexure 16

4.1 The grant of environmental clearance is further subject to compliance of the Standard EC conditions as under:

(A) Statutory Compliance

4(i)	The project proponent shall obtain forest clearance under the provisions of forest (Conservation) Act 1980 in case of the diversion of forest land for non forest purpose involved in the project.	Not Applicable
[ii]	The project proponent shall obtain clearance from the National Board Wildlife, if applicable.	Not Applicable
[iii]	The project proponent shall prepare a site-specific conservation plan/ wildlife management plan and approved by the chief wildlife warden. The recommendation of the approved site-specific conservation plan/wildlife management plan shall be implemented in consultation with the state forest department. The implementation report shall be furnished along with the six monthly compliance report (in case of the presence of schedule-1 species in the study area).	Not Applicable as the mine and its surrounding area does not have any schedule- species
[iv]	The project proponent shall obtain consent to establish/operate under the provisions of Air (Prevention &Control of Pollution) Act 1981 and the water	Consent to Operate for capacity 3 MTY has been obtained vide letter no. Farm/1.DVCAC/JAN No. MPCB-CONSENT-0000168548 / CR /

	(Prevention& Control of Pollution) Act,1974 from the concerned State pollution Control Board/Committee.	2305000846 Dt. 12.05.2023 valid upto 31.03.2024
(v)	The project proponent shall obtain the necessary permission from the Central Ground Water Authority.	CGWA NOC Obtained vide NOC no. CGWA/NOC/MIN/ORIG/2022/7125 dtd 07.01.2022 valid upto 06.01.2027. Renewal of same approved vide 63rd EAC Meeting.
(vi)	Solid/hazardous waste generated in the mines needs to addressed to the solid waste management rules,2016/hazardous & other waste management rules 2016.	Solid waste i.e. Overburden is being handled as per dumping plan. Overburden stacked at designated external OB dump (Dump Id 3). Further Overburden is being backfilled in adjacent mine. Hazardous waste such as Burnt Oil is being sent to authorised recycler for recycling and other hazardous waste such as Oil filter, hose pipe, oily cotton waste is being given to CHWTSDF Surbari for disposal. Detail of disposal during the period 2021-22 (Annual Hazardous Waste return 21-22 enclosed as annexure 18)

(B) Air Quality Monitoring And Preservation

(i)	Continuous ambient air quality monitoring stations as prescribed in the status be established in the core zone as well as in the buffer zone for monitoring of pollutants, namely PM10, PM2.5, SO2 and NOx. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the state pollution control board. Online ambient air quality monitoring stations may also be installed in addition to the regular monitoring stations as per the requirement and/ or in consultation with the SPCB. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr ,etc to be carried out at least once in six months.	1 no. CAAQMS along with MET station is operational in mine core zone and same was installed in consultation with MPCB. Copy of MPCB letter enclosed as annexure 19. Apart from this 4 nos. AAQ monitoring stations are also set up for AAQ monitoring on fortnightly basis. Heavy Metal monitoring is being monitored on half yearly basis through CWPDL (NABL accredited lab). Report of same for the period June 2023 enclosed as annexure 20.

(i)	The Ambient Air Quality monitoring in the core zone shall be carried out to ensure the Coal Industry Standards notified vide GSR 742 E dated 25th September, 2000 and as amended from time to time by the Central Pollution Control Board. Data on ambient air quality and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring data shall be regularly reported to the Ministry/ Regional Office and to the CPCB/SPCB.	Monitoring of Ambient Air Quality is being carried out as per GSR 742 (E) dated 25.09.2000. Data on ambient air quality is being monitored on fortnightly basis and heavy metals such as Hg, As, Ni, Cd, Cr is being monitored on half yearly basis and same is being reported to the Ministry/ Regional Office and to the MPCB along with six monthly EC Compliance report. The ambient air quality monitoring stations are established in consultation with officials of Maharashtra Pollution Control Board, Chandrapur. Monitoring reports for the period from April to Sept 2023 is enclosed as annexure 21. It can be seen that all the parameters are within the prescribed standards. Monitoring of heavy metals has also been carried out by CMPDI in the month of June 2023. Report of the same enclosed as annexure 22. [PM 10] Values of µg/m³ Date / Contractor colony / Kolasi Khurd / Manager office APR 23 [1st FN] / 145 / 136 / 138 APR 23 [2nd FN] / 133 / 132 / 128 MAY 23 [1st FN] / 141 / 132 / 132 MAY 23 [2nd FN] / 137 / 134 / 116 JUNE 23 [1st FN] / 148 / 134 / 142 JUNE 23 [2nd FN] / 145 / 142 / 140 JULY 23 [1st FN] / 155 / 146 / 140 JULY 23 [2nd FN] / 150 / 134 / 131 AUG 23 [1st FN] / 144 / 136 / 142 AUG 23 [2nd FN] / 140 / 131 / 130 SEPT 23 [1st FN] / 140 / 136 / 130 SEPT 23 [2nd FN] / 132 / 145 / 140 Std. / 360 / 360 / 360 [PM2.5] Values of µg/m³ Date / Contractor colony / Kolasi Khurd / Manager office APR 23 [1st FN] / 31 / 38 / 34 APR 23 [2nd FN] / 40 / 42 / 36 MAY 23 [1st FN] / 40 / 32 / 37 MAY 23 [2nd FN] / 32 / 38 / 32 JUNE 23 [1st FN] / 43 / 32 / 31 JUNE 23 [2nd FN] / 30 / 38 / 32 JULY 23 [1st FN] / 43 / 38 / 37 JULY 23 [2nd FN] / 33 / 46 / 33 AUG 23 [1st FN] / 43 / 42 / 41 AUG 23 [2nd FN] / 43 / 40 / 30 SEPT 23 [1st FN] / 30 / 44 / 36 SEPT 23 [2nd FN] / 40 / 30 / 32 Std. / 60 / 60 / 60
(ii)	Transportation of coal to the extent permitted by road, shall be carried out by covered trucks/conveyors. Effective control measures such as	Coal transportation through road is being done only from mine to common Railway Siding (which comes under mine boundary of adjacent mine) and same is being done

	regular water/ mist sprinkling/ rain gun etc shall be carried out in critical areas prone to air pollution (with higher values of PM10/PM2.5) such as haul road, loading/ unloading and transfer points. Fugitive dust emissions from all sources shall be controlled regularly. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central/ State Pollution Control Board.	through tarpaulin covered coal transportation trucks. 3 nos. Fog cannon of 100 mtrs throw with 320 deg rotation installed near Crushers. 1 no. installed at Railway Siding and 2 nos. are in procurement stage at WCL HQ 30 nos. fixed sprinkles installed on Coal transportation road 10 nos. fixed sprinklers of 30 mtrs throw are installed at common Railway Siding 12 nos. fixed sprinklers are provided to control fugitive emission from Coal stockyard All the mobile crushers are provided with Mist sprayers. Dust suppression arrangement on Coal transportation route through mobile tankers is also being done. 2 nos. 28 KL and 2 nos. 13 KL Mobile water tankers are displayed on Coal transportation road and haul road
(iv)	The transportation of coal shall be carried out as per the provisions and route envisaged in the approved Mining Plan or environment monitoring plan. Transportation of the coal through the existing road passing through any village shall be avoided. In case, it is proposed to construct the by-pass road, it should be constructed so that the impact of sound, dust and accidents could be appropriately mitigated.	The transportation of coal is being done from Coal face to stockyard to Crusher to Railway siding. From Coal face to Railway siding, the complete coal transportation route lies within the mine property of WCL Main Area. Plan showing Coal transportation route enclosed as annexure 22
(v)	Vehicular emissions shall be kept under control and regularly monitored. All the vehicles engaged in mining and allied activities shall operate only after obtaining 'PUC' certificate from the authorised pollution testing centres.	All the light vehicles namely jeep & trucks etc. having valid PUC certificate for vehicular emission through RTO approved agency are used. PUC of vehicles enclosed as annexure 23
(vi)	Coal stock pile/ crusher/ feeder and breaker material transfer points shall invariable be provided with dust suppression system. Belt-conveyor shall be fully covered to avoid air borne dust. Side cladding all along the conveyor gantry should be made to avoid air borne dust. Drills shall be wet operated or fitted with dust extractors.	12 nos. fixed sprinklers are provided to control fugitive emission from Coal stockyard & 30 nos. fixed sprinklers installed on Coal transportation road All the mobile crushers are provided with Mist sprayers. 2 nos. 28 KL and 2 nos. 13 KL Mobile water tankers are displayed on Coal transportation road and haul road 3 nos. Fog cannon of 100 mtrs throw with 320 deg rotation installed near Crushers. 1 no. installed at Railway Siding and 2 nos. are in procurement stage at WCL HQ Drills are wet operated
(vii)	Coal handling plant shall be operated with effective control measures w.r.t. various environmental parameters.	Mobile crushers are provided with Mist sprayers. Also, these mobile crushers are covered with side cladding to control

	Environmental friendly sustainable technology should be implemented for mitigating such parameters.	fugitive emission. This help in controlling localised dust emission. Fixed sprinkler at common CHP Premises (CHP of adjacent mine) with mist and water spray nozzles at transfer points, feeder breaker, crushers, on conveyor belts etc. Conveyors are completely covered with side cladding. 3 nos. Fog cannon of 100 mts throw with 320 deg rotation installed near Crushers. 1 no. installed at Railway Siding and 2 nos. are in procurement stage at WCL HQ

(C) Water Quality Monitoring and Preservation

(i)	The effluent discharge [mine waste water, workshop effluent] shall be monitored in terms of the parameters notified under the water Act, 1974 Coal Industry Standards vide GSR 742 E dated 25th September, 2000 and as amended from time to time by the Central Pollution Control Board.	Mine Water discharge, Workshop ETP effluent is being monitored vide GSR 742 E dated 25th September, 2000. MINE WATER DISCHARGE Date / pH / COD / TSS / O&G APR 22 [1st Fn] 7.72 32.00 30.00 BDL APR 22 [2nd Fn] 7.54 30.00 32.00 BDL MAY 22 [1st Fn] 7.44 42.00 28.00 BDL MAY 22 [2nd Fn] 7.24 48.00 38.00 BDL JUNE 22 [1st Fn] 7.52 48.00 34.00 BDL JUNE 22 [2nd Fn] 7.65 56.00 41.00 BDL JULY 22 [1st Fn] 7.46 52.00 43.00 BDL JULY 22 [2nd Fn] 7.30 40.00 32.00 BDL AUG 22 [1st Fn] 7.08 40.00 48.00 BDL AUG 22 [2nd Fn] 7.28 44.00 32.00 BDL SEPT 22 [1st Fn] 7.06 48.00 28.00 BDL SEPT 22 [2nd Fn] 7.68 36.00 40.00 BDL WORKSHOP ETP EFFLUENT Date / pH / COD / TSS / O&G APR 22 [1st Fn] 8.32 36.00 32.00 BDL APR 22 [2nd Fn] 7.65 44.00 30.00 BDL MAY 22 [1st Fn] 7.60 52.00 28.00 BDL MAY 22 [2nd Fn] 7.24 48.00 38.00 BDL JUNE 22 [1st Fn] 7.42 52.00 44.00 BDL JUNE 22 [2nd Fn] 7.56 40.00 36.00 BDL JULY 22 [1st Fn] 8.01 56.00 48.00 BDL JULY 22 [2nd Fn] 7.30 44.00 36.00 BDL AUG 22 [1st Fn] 8.56 44.00 30.00 BDL AUG 22 [2nd Fn] 7.08 36.00 30.00 BDL SEPT 22 [1st Fn] 7.40 52.00 40.00 BDL SEPT 22 [2nd Fn] 8.30 40.00 30.00 BDL
(ii)	The monitoring data shall be uploaded on the company's website and displayed at the project site at a suitable location. The circular No.J-20012/1/2006-IA.11 (M) dated 27th May, 2009 issued by Ministry of Environment, Forest and Climate Change shall also be referred in this regard for its compliance.	Compiled All the monitoring reports are being uploaded on westernccl website under SECTION -> DEPARTMENT -> ENVIRONMENT -> ENVIRONMENT QUALITY REPORT. Snapshot of page enclosed as annexure 24 http://www.westernccl.in/index.php/staticpage/153

(iii)	Regular monitoring of ground water level and quality shall be carried out in and around the mine lease area by establishing a network of existing wells constructing new piezometers during the mining operations. The monitoring of ground water levels shall be carried out four times a year i.e. pre-monsoon, monsoon, post-monsoon and winter. The ground water quality shall be monitored once a year, and the data thus collected shall be sent regularly to MOEFCC/ RO.	Regular monitoring of ground water level and quality is being carried out in and around the mine lease. The monitoring is carried out four times in a year pre- monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January) and the data thus collected is being sent regularly to Ministry of Environment, Forest and Climate Change and its Regional Office, Central Ground Water Authority and Regional Director, Central Ground Water Board Report of the monitoring (December 2022 to August 2023) has been submitted to your good office vide letter no. WCL/MA/ACM/ENV/2023/252 dated 18.11.2023. Report of same enclosed as annexure 25
(iv)	Monitoring of water quality upstream and downstream of water bodies shall be carried out once in six months and record of monitoring data shall be maintained and submitted to the Ministry of Environment, Forest and Climate Change/ Regional Office.	Monitoring of water quality upstream and downstream of Wardha River is being carried out regularly and report of same is also submitted to MPCB & MoEF on regular basis. Copy of latest report GE June 2023 & GE Sept 2023 enclosed as annexure 4
(v)	Ground water, excluding mine water, shall not be used for mining operations. Rainwater harvesting shall be implemented for conservation and augmentation of ground water resources.	Complied Ground water excluding mine water is not being used for mining operations. Rain Water Harvesting Pond of dimension 88 mtr x 18 mtr x 1.20 m has been constructed by considering the long term benefits. Apart from this, roof top rain water harvesting is being implemented at office building such as GVTC, Coal testing lab, filter plant, Hospital, Rescue room, Bendiya Vidhyalay. Further, old underground galleries of UG mine also helped in storing water. Also, the abandoned voids of adjacent mine also help in storing and recharging ground water. It helps in augmenting ground water resources.
(vi)	Catch and/ or garland drains and siltation ponds in adequate numbers and appropriate size shall be constructed around the mine working.	Garland drains of dimension (Length 6400 mtr, Avg. width 2.50 mtr, Avg.

	coal heaps & OB dumps to prevent run off of water and flow of sediments directly into the river and water bodies. further, dump material shall be properly consolidated/ compacted and accumulation of water over dumps shall be avoided by providing adequate channels for flow of silt into the drains. The drains/ ponds so constructed shall by regularly desilted particularly before onset of monsoon and maintained properly. Sump capacity should provide adequate retention period to allow proper settling of silt material. The water so collected in the sump shall be utilised for dust suppression and green belt development and other industrial use. Dimension of the retaining wall constructed, if any, at the toe of the OB dumps within the mine to check run-off and siltation should be based on the rainfall data. The plantation of native species to be made between toe of the dump and adjacent field/ habitation/ water bodies.	Depth: 2.00 mtr) is provided around the mine. Catch drain of dimension (Length: 4980 mtr, Avg. width: 2.50 mtr, Avg. Depth: 2.00 mtr) provided around OB dumps. Photographs of Catch drain and Garland Drain enclosed as annexure 26 & 27. Desilting of catch drains and garland drains is done every year before onset of monsoon departmentally. The catch drains provided all around the OB Dump acts as an arrestor against any flow of silt and sediments into the nearby feeder nala. As such specifically, at present there is no requirement of retaining wall at the toe of the dump. Moreover, grass seeding has been plotted over the slopes which further protects the flow of silts and sediments.
(vii)	Adequate groundwater recharge measures shall be taken up for augmentation of ground water. The project authorities shall meet water requirements of nearby village(s) after due treatment conforming to the specific requirement/standards.	Rain Water Harvesting Pond of dimension 85 mtr x 18 mtr x 1.20 m has been constructed by considering the long term benefits. Apart from this, roof top rain water harvesting is being implemented at office building such as GVTC, Coal testing lab, filter plant, Hospital, Rescue room, Kendriya Vidhyalay. Further, old underground galleries of UG mine also helped in storing water. Also, the abandoned voids of adjacent mine also help in storing and recharging ground water. It helps in augmenting ground water resources. It helps in augmenting ground water resources. Due to availability of waterbodies such as Wardha River in South West, Sirpur Nala in North East and Kondal Nala in North West direction, there is no scarcity of water in the vicinity. If any water requirement base of nearby village come to the notice, project authority will take all necessary measures to fulfill the requirement.

(viii)	Industrial waste water generated from CHP, workshop and other waste water, shall be properly collected and treated so as to conform to the standards prescribed under the standards prescribed under water Act, 1974 and Environment (Protection) Act,1986 and the rules made there under, and as amended from time to time. Adequate ETP/STP needs to be provided.	ETP of 100 KLD capacity with Oil Skimmer is provided for treating the effluent generated from washing of HEMM ETP Effluent Date | pH | COD | TSS | O&G APR 23 (1st FN) | 8.32 | 96.00 | 22.00 | BDL APR 23 (2nd FN) | 7.65 | 44.00 | 30.00 | BDL MAY 23 (1st FN) | 7.65 | 38.00 | 32.00 | BDL MAY 23 (2nd FN) | 7.74 | 48.00 | 35.00 | BDL JUNE 23 (1st FN) | 7.62 | 52.00 | 44.00 | BDL JUNE 23 (2nd FN) | 7.36 | 40.00 | 36.00 | BDL JULY 23 (1st FN) | 8.01 | 56.00 | 44.00 | BDL JULY 23 (2nd FN) | 7.00 | 44.00 | 36.00 | BDL AUG 23 (1st FN) | 6.96 | 48.00 | 34.00 | BDL AUG 23 (2nd FN) | 7.08 | 38.00 | 30.00 | BDL SEPT 23 (1st FN) | 7.40 | 52.00 | 43.00 | BDL SEPT 23 (2nd FN) | 8.30 | 40.00 | 36.00 | BDL At present all the workers of this mine are residing at old colony of erstwhile New Majri UG Mine no. II whereas the sewage generated is treated through Septic tank & Soak Pits. There is no new/ dedicated colony constructed for this mine. STP of suitable capacity will be constructed along with the construction of new quarters for the workers of New Majri UG to OCT mine
(ix)	The water pumped out from the mine after siltation, shall be utilised for industrial purpose viz. watering the mine area, roads, green belt development etc. The drains shall be regularly desilted particularly after monsoon and maintained properly.	Water pumped out of mine goes into after siltation is being used for dust suppression, fire fighting etc. Culvert drains and Garland drains are being desilted before the onset of every monsoon
(x)	The surface drainage plan including surface water conservation plan for the area of influence affected by the said mining operations, considering the presence of river/ rivulet/pond/ lake etc. shall be prepared and implemented by the project proponent. The surface drainage plan and/or any diversion of natural water courses shall be as per the approved Mining Plan/EIA/EMP report and with due approval of the concerned State/Central Authority. The construction of embankment to prevent any danger against inrush of surface water into the mine should be as per the approved Mining Plan and as per the	A detailed report on riverine eco-system has been prepared. Copy of same submitted along with Six Monthly EC Compliance report of March 2022 [Copy of Kwaina ecosystem conservation plan again enclosed in annexure 28] The Mining activity is strictly carried out as per the approved Mining Plan and with due permission of DGMS. The same will continue to be operated as per the above. Diversion of Korad nullah was done as per the design at CCDD Noida. Design report enclosed at annexure 29 The construction of embankment to prevent any danger against inrush of

	permission of DGMS or any other authority as prescribed by the law.	surface water into the mine was done as per the approved Mining Plan and as per the guidelines of DGMS
(xi)	The project proponent shall take all precautionary measures to ensure riverine/riparian ecosystem in and around the coal mine up to a distance of 5 km. A riverine/riparian ecosystem conservation and management plan should be prepared and implemented in consultation with the irrigation/water resources department in the state government.	Riverine/ riparian ecosystem conservation and management plan is prepared and some will be implemented in consultation with the irrigation/water resources department in the state government. Copy of same submitted along with Six Monthly EC Compliance report of March 2022. Copy of same is enclosed as annexure 28

(D) Noise And Vibration Monitoring And Prevention

(i)	Adequate measures shall be taken for control of noise levels as per Noise Pollution Rules, 2016 in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with personal protective equipments (PPE) i.e. ear plugs/muffs in conformity with the prescribed norms and guidelines in this regard. Adequate awareness programme for users to be conducted. Progress in usage of such accessories to be monitored.	Adequate measures namely proper maintenance of HEMM and controlled blasting is being done so as to control noise levels below 85 dB(A). The workers engaged in noisy environment are provided with ear plugs/muffs. Details of PPE distribution enclosed as annexure 30 Noise Monitoring stations are established for monitoring the noise level data and regularly monitored. Noise levels in dB (A) Core: Ft Office; Colony Day / Night / Day / Night APR 23 (1st FN): 41.90 / 49.80 / 46.90 / 45.80 APR 23 (2nd FN): 56.80 / 57.40 / 48.80 / 45.90 MAY 23 (1st FN): 58.10 / 57.30 / 47.90 / 44.10 MAY 23 (2nd FN): 56.60 / 56.40 / 47.80 / 46.10 JUNE 23 (1st FN): 57.60 / 56.50 / 47.70 / 46.10 JUNE 23 (2nd FN): 56.30 / 56.10 / 48.70 / 47.50 JULY 23 (1st FN): 58.60 / 57.40 / 48.50 / 45.10 JULY 23 (2nd FN): 54.60 / 52.70 / 43.30 / 42.20 AUG 23 (1st FN): 55.60 / 55.60 / 42.80 / 40.30 AUG 23 (2nd FN): 54.00 / 55.30 / 43.80 / 42.50 SEPT 23 (1st FN): 54.20 / 55.50 / 44.80 / 42.30 SEPT 23 (2nd FN): 55.00 / 56.40 / 44.70 / 43.30 Std: 75 / 70 / 55 / 45
(ii)	Controlled blasting techniques shall be practised in order to mitigate ground vibrations, fly rocks, noise and air blast etc., as per the guidelines prescribed by the DGMS.	Controlled blasting is being done as per DGMS guidelines with cord relay and shock tubes. Blasting permission accorded by DGMS enclosed as annexure 14
(iii)	The noise level survey shall be carried out as per the prescribed guidelines to access noise exposure of the workman at vulnerable points in the mine premises, and report in this	Noise level survey shall be carried out as per the DGMS guidelines to access noise exposure of the workman at vulnerable points in the mine premises. Report of

	regard shall be submitted to the ministry/ RO on six-monthly basis.	Personal dust sampler monitoring enclosed as annexure 31

(E) Mining Plan

(i)	Mining shall be carried out under strict adherence to provisions of the Mines Act 1952 and subordinate legislation made there-under as applicable.	Mining is carried out as per the provisions of the Mines Act 1952
(ii)	Mining shall be carried out as per the approved mining plan(including Mine Closure Plan) abiding by mining laws related to coal mining and the relevant circulars issued by Directorate General Mines Safety (DGMS).	All the activities are being done as per Approved Mining Plan. DGMS circulars are being strictly followed. Mine Closure Plan will be implemented as the mine will reach in final stage of operation.
(iii)	No mining shall be carried out in forest land without obtaining forestry Clearance as per Forest (Conservation) Act, 1980.	There is no forest land involved in this project
(iv)	Efforts should be made to reduce energy and consumption by conservation, efficiency improvements and use of renewable energy.	Steps for installation of energy efficient lighting is being taken in mine. Details of energy efficient lighting installed are enclosed as annexure 32. Renewable energy such as roof top solar power installation at the AGM office and building of Kendra Vidhyalaya is also implemented (Details of Solar installation with Photographs enclosed as annexure 33)

(F) Land Reclamation

(i)	Digital survey of entire lease hold area/ core zone using Satellite Remote Sensing survey shall be carried out at least once in three years for monitoring land use pattern and report in 1:30,000 scale or as notified by Ministry of Environment, Forest and Climate Change (MOEFCC) from time to time shall be submitted to MOEFCC/Regional Office (RO).	Land use pattern of the mine is studied every 3 year through Satellite imagery. Monitoring of same has been done by CMPDIL in 2022. Report of same is uploaded on WCL Website (http://www.westernlcoal.in/Remote/220). Snapshot of webpage shown at annexure 34
(ii)	The final mine void depth should preferably be as per the approved Mine Closure Plan.	The final mine void depth will be as per the approved Mine Closure Plan.

<table>
<tr><td></td><td>and in case it exceeds 40 m, adequate engineering interventions shall be provided for sustenance of aquatic life therein. The remaining area shall be backfilled and covered with thick and alive top soil. Post-mining land be rendered usable for agricultural/ forestry purposes and shall be diverted. Further action will be backed as specified in the guidelines for preparation of Mine Closure Plan issued by the Ministry of coal dated 27th August,2009 and subsequent amendments.</td><td>Adequate care will be taken to sustain aquatic life as the void depth will be more than 40 mtr as per mine closure plan once the mine is closed.

Backfilled area will be reclaimed by plantation or other useful purposes.

Mine closure plan/ guidelines will be followed.</td></tr>
<tr><td>(ii)</td><td>The entire excavated area, backfilling, external OB dumping (including top soil) and afforestation plan shall be in conformity with the "during mining"/"post mining" land-use pattern, which is an integral part of the approved Mining Plan and the EIA/ EMP submitted to this Ministry. Progressive compliance status vis-à-vis the post mining land use pattern shall be submitted to the MoEF&CC/RO.</td><td>PLANTATION PROG. AS PER EMP

<table>
<tr><th rowspan="2">Year</th><th colspan="2">Dumps</th><th colspan="2">Backfilled</th><th colspan="2">Others</th></tr>
<tr><th>Area (Ha)</th><th>Nos.</th><th>Area (Ha)</th><th>Nos.</th><th>Area (Ha)</th><th>Nos.</th></tr>
<tr><td>1st yr</td><td>0</td><td>0</td><td>0</td><td>0</td><td>20</td><td>50000</td></tr>
<tr><td>5th yr</td><td>0</td><td>0</td><td>0</td><td>0</td><td>50.2</td><td>125500</td></tr>
<tr><td>10th yr</td><td>60</td><td>150000</td><td>0</td><td>0</td><td>70.2</td><td>175500</td></tr>
<tr><td>15th yr</td><td>84.6</td><td>211500</td><td>0</td><td>0</td><td>90.2</td><td>225500</td></tr>
<tr><td>End of life</td><td>84.6</td><td>211500</td><td>0</td><td>0</td><td>150.2</td><td>375500</td></tr>
</table>

ACTUAL PLANTATION AS ON DATE

2016-17 = 20,000 Nos. over an area of 8 Ha (PLAIN)

2018-19 = 15,000 Nos. over an area of 6 Ha (PLAIN)

2019-20 = 15,000 Nos. over an area of 6 Ha (PLAIN)

2021-22 = 35,000 Nos. over an area of 14 Ha (PLAIN) & 15,000 Nos. over an area of 6 Ha (TOP SOIL DUMP)

2022-23 = 40,000 Nos. over an area of 16 Ha (TOP SOIL DUMP)

2023-24 = 40,000 Nos. over an area of 16 Ha (TOP SOIL DUMP)</td></tr>
<tr><td>(iv)</td><td>Fly ash shall be used for external dump of overburden, backfilling or stowing of mine as per provisions contained in clause (i) and (j) of subparagraph (8) of fly ash notification issued vide SO 2804 (E) dated 3rd November 2009</td><td>There is no provision of Fly Ash backfilling or using fly ash for mixing in external dump in approved mining plan.

New Majri UG to OC mine is also not yet been approached by any Thermal Power Plant for Ash dumping in mine voids/ external OB Dumps or for utilisation of gypsum in dumps.</td></tr>
</table>

	as amended from time to time. Efforts shall be made to utilize gypsum generated from Flue Gas Desulfurization (FGD) if any, along with fly ash for external dump of overburden, backfilling of mines. Compliance report shall be submitted to Regional Office of MoEF&CC, CPCB and SPCB.	As per the notification, fly ash for backfilling will be utilized as per notification of the end of mine life when the mine gets abandoned.
(v)	Further, it may be ensured that as per the time schedule specified in mine closure plan it should remain live till the point of utilization. The topsoil shall temporarily be stored at earmarked site (s) only and shall not be kept unutilized. The topsoil shall be used for land reclamation and plantation purposes. Active OB dumps shall be stabilised with native grass species to prevent erosion and surface run off. The other overburden dumps shall be vegetated with native flora species. The excavated area shall be backfilled and afforested in line with the approved Mine Closure Plan. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self sustaining. Compliance status shall be submitted to the ministry of Environment, Forest and Climate Change' Regional Office.	10,623 Mm³ Top soil has been excavated till 30.09.2023 and is being stored in the earmarked site and will be utilized as per the plantation programme. 33,130 Mm³ OB (excl. top soil) has been excavated till 30.09.2023 and is being stocked at the earmarked dump site only. Grass seeding is being done on Top soil & Hard OB dumps. Moreover, 95,000 nos. trees are planted on both Top Soil dumps to reclaim the dump. However, as per the approved mining plan & Mine closure plan, the entire de-coaled area will be converted into water body as no backfilling is proposed for excavated area of MMUG to OC mine quarry. Backfilling of adjacent mine is being done from OB of this mine. Regarding Monitoring and management of rehabilitated areas, it is submitted that, the same in respect of external OB dump is yet to start as the dump is active. But after vegetation / plantation, the monitoring and management will be continued till it becomes self-sustaining. Compliance against this condition is a part of Six monthly EC Compliance report which is submitted to RO, MoEF&CC regularly and will continue to be submitted.
(vi)	The project proponent shall make necessary alternative arrangements, if grazing land is involved on core zone, in consultation with the State government to provide alternate areas for livestock grazing, if any. In this context, the project proponent shall implemented the directions of Hon'ble Supreme Court with regard to acquiring grazing land.	Not Applicable, most of the land acquired was agriculture land. However, Full grown patch of plantation in green belt (adjacent to mine boundary) are being used by nearby villages for livestock grazing. Further, to inform that to minimize the land acquisition, no separate land is acquired as grazing land.

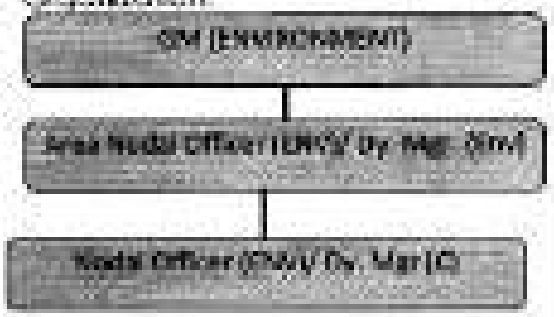
(G) Green Belt

(j)	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered/endemic flora/fauna, if any, spotted/reported in the study area. The Action plan in this regard, if any, shall be prepared and implemented in consultation with the State Forest and Wildlife Department.	Not Applicable as there is no endangered/endemic flora/fauna in and around mine area.
(k)	Greenbelt consisting of 3-tier plantation of width not less than 7.5 m shall be developed all along the mine lease area as soon as possible. The green belt comprising a mix of native species (endemic species should be given priority) shall be developed all along the major approach/ coal transportation roads.	The green belt comprising a mix of native species. Photographs enclosed as annexure 7 80,000 trees planted over an area of 34 Ha over plain land between mine and adjacent villages along western boundary of mine and 95,000 nos. over an area of 36 Ha on Top Soil dump. Once the trees will grow up or during the course of plantation, it will help in developing the environment where the shrubs, herbs, creepers of native species will grow and develop 3-tier plantation.

(H) Public Hearing and Human Health Issues

(i)	Adequate illumination shall be ensured in all mine locations (as per DGMS standards) and monitored weekly. The report on the same shall be submitted to this ministry & it's RO on six-monthly basis.	Adequate illumination is being done in all mine locations. Records of illumination enclosed as annexure 34
(j)	The project proponent shall undertake occupational health survey for initial and periodical medical examination of the personnel engaged in the project and maintain records accordingly as per the provisions of the Mines Rules, 1955 and DGMS circulars. Besides regular periodic health check-up,20% of the personnel identified from workforce engaged in active mining operation shall be subjected to health check-up for occupational diseases and hearing impairment time to time.	Complied Regular and Periodical medical examination (ME and PME) of the workers (Departmental as well as contractual workers) has been undertaken at Moji Area Hospital of WCL. Area Hospital is headed by Chief Medical Officer. Health check-up to detect for occupational diseases and hearing impairment is also being done. Year-wise Details of PME/ ME enclosed as annexure 7
(k)	Personnel (including outsourced employees) working in core zone shall wear protective respiratory devices and shall also be provided with	Personnel (including outsourced employees) working in mine is provided with protective respiratory devices and adequate training and information on

	adequate training and information on safety and health aspects.	safety and health aspects is also provided at GVTC Majri on inducting in mining activity as well as on regular basis till they work in mines of WCL MAJRI AREA.
(iv)	Implementation of the action plan on the issues raised during the public hearing shall be ensured. The project proponent shall undertake all the tasks/measures as per the action plan submitted with statutory provisions during the public hearing. Land oustees shall be compensated as per the norms laid down in the R&R policy of the company/State Government/Central Government, as applicable.	Majority of points under public consultation are related to employment. Both direct and indirect employment is being generated due to the project. The work of Rs 7.48 Lakhs for providing tubewell at Pataspach village is done as per the commitment made during public hearing. Work order and photographs of work enclosed. Apart from this various activity to be carried under CER are also enclosed, like such activities such as Medical Camps, Health survey, check up, Skill Development training for people in nearby villages, development of roads, Rain Water Harvesting works, Avenue Plantation providing saplings for plantation in nearby villages are being done. Land oustees shall be compensated as per the norms laid down in the CIL R&R policy.
(v)	The project proponent shall follow the mitigation measures provided in the Ministry's OM No 7-5/2013/IA-III (M) dated 29th October, 2014 titled "Impact of mining activities on habitations/issues related to the mining projects wherein habitations and villages are the part of mine lease area or habitations and villages are surrounded by the mine lease area.	There is no habitation within the Project area. Further, with reference to the Circular 29.10.2014, we have been practicing non mine practices such as providing catch drains, garland drains to arrest runoff from the dumps. Adequate rain water harvesting measures are also being taken in and around mine area to recharge the groundwater levels. Regular monitoring of ground water level is also being done in mine and buffer zone of the mine. Illumination and sound level of the mine are being monitored regularly inside mine as well as on nearby habitations. Full grown patch of plantation are being used by nearby villagers for livestock grazing. Some plantation is also act as shelter for these livestock during scorching summers. Vibration monitoring is also being done in nearby Pataspach village from time to time to ascertain the impact of blasting. Mobile water tankers are used for dust suppression on haul road and fixed sprinklers are provided for dust suppression on coal transportation road.

(i)	The project proponent shall comply with the provisions contained in this Ministry's OM vide F.No.22-65/2017-IA.III dated 1st May 2018, as applicable, regarding Corporate Environment Responsibility.	The work of Rs 2.46 lacks for providing tubewell at Pulogaon village is done as per the commitment made during public hearing under CER Head. Few such activities such as Medical Camps, Health survey/ check-up, Skill Development training for people in nearby villages, development of roads, Rain Water Harvesting works, Avenue Plantation, providing saplings for plantation in nearby villages are also being done. However, as the project is running/ already operational, works taken up in nearby village are accounted in CSR Head.
(ii)	The company shall have a well laid down environmental policy duly approve by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/ deviation/ violation of the environmental/ forest/ wildlife norms/ conditions. The company shall have defined system of reporting infringements/ deviation/ violation of the environmental/ forest/ wildlife norms/ conditions and/ or shareholders/ stake holders.	Coal India Limited has its well laid down environmental policy duly approve by the CIL Board. The Environment Policy prescribes for standard operating process/ procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions. The company has a well laid down system of reporting of non-compliances/ violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.
(iii)	A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization.	Environment Cell exists at HQ, Area & project level. GM (environment) directly reports to the head of the Organization. 
(iv)	Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in	The year wise funds earmarked for environmental protection measures are kept in separate account and not diverted for any other purpose.

	separate account and not to be diverted for any other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the Six Monthly Report.	Details of Expenditure under EMP Capital and Revenue head enclosed as annexure 35
(v)	Self environmental audit shall be conducted annually. Every three years third party environmental audit shall be carried out.	Environmental Audit Cell has been formulated to ensure implementation of all the EC Conditions vide letter no. WCL/HQ/ENV/2018 & 254/71-81 dated 18.02.2017. Schedule of Latest Inter Area Inspection enclosed as annexure 36

(I) Miscellaneous

(i)	The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards of their cost by prominently advertising it at least in two local newspapers of the district or State, of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the project proponent's website permanently.	Complied. Advertisement given in following 2 Newspapers :- 1) Chandrapur Samachar (Marathi) dated 06.01.2021 2) Manoj Vartha (Hindi) dated 06.01.2021
(ii)	The copies of the environmental clearance shall be submitted by the project proponent to the heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.	Copies of the environmental clearance is submitted to the heads of local bodies, Panchayats and Municipal Bodies and relevant offices of the Government between 30.01.21 to 05.01.21
(iii)	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including result of monitored data on their website and update the same on half yearly basis.	Compliance of the stipulated environment clearance conditions, including result of monitored data are uploaded on WCL website regularly (http://www.wclcm.com/index.php/tender/270)
(iv)	The project proponent shall monitor the criteria pollutants level namely; PM10, SO2, NOx (ambient levels) or critical sectoral parameters, indicated for the projects and display the same at a convenient location for disclosure to the public and put on the website of the company.	Pollutants level namely; PM10, PM2.5, CO, SO2, NOx are being monitored at CAAQMS and same is displayed at LED Board installed at CAAQMS Station. Moreover, Ambient AAQ monitoring in core and buffer zone. Data of same is displayed on manual noticeboard installed at Manager Office. Photograph of same enclosed as annexure 37

(v)	The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the ministry of environment, forest and Climate Change at environment clearance portal.	Six monthly EC Compliance reports are uploaded on MoEF Website/ portal regularly
(vi)	The project proponent shall follow the mitigation measures provided in this Ministry's OM No. 22-11013/87/2014-IA. II (M) dated 25th October,2014, titled 'Impact of mining activities on habitations-issues related to the mining projects wherein habitations and villages are the part of mine lease areas or habitations and villages are surrounded by the mine lease area'.	There is no habitation within the Project area. Further, with reference to the OM dtd 29.10.2014, we have been practicing best mine practices such as providing catch drains, garland drains to arrest runoff from the dumps. Adequate rain water harvesting measures are also being taken in and around mine area to recharge the groundwater levels. Regular monitoring of ground water level is also being done in core and buffer zone of the mine. Illumination and sound level of the mine are being monitored regularly inside mine as well as at nearby habitation. Full grown patch of plantation are being used by nearby villager for livestock grazing. Same plantation is also act as shelter for these livestock's during scorching summer. Vibration monitoring is also being done in nearby Patola village from time to time to ascertain the impact of blasting. Mobile water tankers are used for dust suppression on haul road and Fixed sprinklers are provided for dust suppression on coal transportation road.
(vii)	The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986 as amended subsequently and put on the website of the company.	Environment Statement for 2022-23 has been submitted to WPCB vide UAN No. 36782 on dated 05.09.2023 as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently. Copy of Environment Statement 2022-23 enclosed as annexure-38. Same is also been uploaded on the Company's website along with the status of compliance of EC conditions (http://www.westernpcl.in/?q=node/220).
(viii)	The project authorities shall inform to the Regional Office of the MOEF&CC	Information to the Regional Office of the MOEF&CC regarding commencement of

	regarding commencement of mining operations.	mining operations has been given via e-mail dated 31.01.2021.
(ix)	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.	Noted and is being complied
(x)	The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during Public Hearing and also that during their presentation to the Expert Appraisal Committee.	Noted and is being complied
(xi)	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change.	Noted
(xii)	Concealing factual data or submission of false/ fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act,1986.	Noted
(xiii)	The ministry may revoke or suspend the clearance, if implementation of any of the above conditions is unsatisfactory.	Noted
(xiv)	The ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.	Noted
(xv)	The regional office of this ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer(s) of the Regional Office by furnishing the required data/ information/ monitoring report).	Noted
(xvi)	The above conditions shall be enforceable 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, Hazardous and Other Waste (Management and Trans-boundary Movement) Rules, 2016 and the public liability insurance Act, 1991 along with their amendments and rules and any other orders passed by the Hon'ble supreme court of India/ High courts and any other court of law relating to the subject matter.	Noted
5.	The proponent shall abide by all the commitment and recommendations made in the EIA/EMP report and also that during presentation to the EAC. All the commitments made on the issues raised during public hearing shall also be implemented in letter and spirit.	Noted
6.	The proponent shall obtain all necessary clearances/ approvals that may be required before the start of the project. The Ministry or any other competent authority may stipulate any further condition for environmental protection. The Ministry or any other competent	Noted and complied

	authority may stipulate any further condition for environmental protection.	
7.	Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under section 16 of the National Green Tribunal Act 2010.	Noted
8.	The coal company/ project proponent shall be liable to pay the compensation against the illegal mining, if any, and as ordered by the respective State Governments at any point of time in terms of the orders dated 2nd August, 2017 of Hon'ble Supreme Court in WP(Civil) No.114/2014 in the matter of "Common Cause Vs Union of India & other.	There is no Illegal mining in the jurisdiction of WCL Majri Area
9.	The concerned State Government shall ensure no mining operations to commence till the entire compensation for illegal mining, if any, is paid by the project proponent through their respective Department of mining & Geology, in strict compliance of the judgment of Hon'ble Supreme Court.	There is no Illegal mining in the jurisdiction of WCL Majri Area
10.	The environmental compliance shall not be operational till such time the project proponent complies with the above said judgment of Hon'ble Supreme Court as applicable and other statutory requirements.	Noted

20/8/2014

Sub Area Manager
For A Expansion of New Majri UG to OC Mine
New Majri Sub Area

MAHARASHTRA POLLUTION CONTROL BOARD

Tel: 24010706/24010437
Fax: 24023516
Website: http://mpcb.gov.in
Email: cac-cell@mpcb.gov.in

Kalpataru Point, 2nd and 4th floor, Opp. Cine Planet Cinema, Near Sion Circle, Sion (E), Mumbai-400022

RED/L.S.I (R35)
No:- Format1.0/CAC/UAN No.MPCB-CONSENT-0000160648/CR/2305000846

Date: 12/05/2023

To,
M/s Western Coalfields Limited,
Expansion of New Majri UG to OC Mine,
At-Majri,Tal-Bhadrawati, Dist-Chandrapur.

Your Service is Our Duty

Sub: Renewal of consent with increase in CI under RED category.

Ref:
1. Consent granted by Board for existing mine vide No.Format1.0/CAC/UAN-130759/CR/2207001196 dated 24.07.2022 valid up to 31.03.2023.
2. Minutes of Consent Appraisal Committee Meeting held on 24.04.2023.

Your application No.MPCB-CONSENT-0000160648 Dated 28.01.2023

For: grant of Consent to Operate under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization under Rule 6 of the Hazardous & Other Wastes (Management & Transboundary Movement) Rules 2016 is considered and the consent is hereby granted subject to the following terms and conditions and as detailed in the schedule I, II, III & IV annexed to this order:

1. **The consent to renewal is granted for a period up to 31/03/2024**
2. **The capital investment of the project is Rs.188.978 Crs. (As per Balance Sheet submitted by industry Existing CI is Rs.169.375 Cr + increase in CI Rs. 19.603 Cr = Total CI- Rs.188.978 Cr.)**
3. **Consent is valid for the manufacture of:**

Sr No	Product	Maximum Quantity	UOM
Products			
1	Coal	3	MTPA

4. **Conditions under Water (P&CP), 1974 Act for discharge of effluent:**

Sr No	Description	Permitted (in CMD)	Standards to	Disposal Path
1.	Trade effluent	3973	As per Schedule-I	Recycle/Reuse 100% for dust suppression and fire fighting

Sr No	Description	Permitted	Standards to	Disposal
2.	Domestic effluent	4	As per Schedule-I	On land for gardening

5. **Conditions under Air (P& CP) Act, 1981 for air emissions:**

Sr No.	Stack No.	Description of stack / source	Number of Stack	Standards to be achieved
1	0	NA	0	As per Schedule -II

6. **Non-Hazardous Wastes:**

Sr No	Type of Waste	Quantity	UoM	Treatment	Disposal
1	Overburden	600000	m3/month	Landfilling	Back filling and reclamation of Land

7. **Conditions under Hazardous & Other Wastes (M & T M) Rules 2016 for treatment and disposal of hazardous waste:**

Sr No	Category No./ Type	Quantity	UoM	Treatment	Disposal
1	5.1 Used or spent oil	90	KL/A	Recycle	send to Authorised Recycler/Re-processor
2	5.2 Wastes or residues containing oil	2	Ton/Y	Incineration	CHWTSDF
3	35.3 Chemical sludge from waste water treatment	9	Ton/Y	Landfill	CHWTSDF

8. The Board reserves the right to review, amend, suspend, revoke etc. this consent and the same shall be binding on the industry.
9. This consent should not be construed as exemption from obtaining necessary NOC/permission from any other Government authorities.
10. The applicant shall comply with the conditions of the Environmental Clearance granted by MoEF-CC, GoI vide letter No.J-11015/25/2008-IA. II(M) dated 01.01.2021.
11. PP shall extend the existing BG of Rs.25.0 Lakh towards O & M of Pollution control system and towards compliance of consent and EC conditions for the period up to 31.12.2025.
12. PP shall submit the copy of renewed NOC of CGWA within 3 months
13. PP shall provide the mechanized sweeping machine for road dust cleaning within 3 months period and submit the BG of Rs.5.0 Lakh towards compliance of same.
14. PP shall provide the tyre wash system at mine entry and exit points within 3 months period and submit the BG of Rs.5.0 Lakh towards compliance of same.
15. PP shall convert existing water sprinkling arrangement into chemical fogging arrangement ($MgCl_2$) within three months period.
16. PP shall install the 5 number fog cannon as per the EC conditions as industry has installed only 3 number fog cannon.
17. PP shall submit the BG as per BG regime of Mines
18. PP shall carry out over burden dump management as per CPCB guidelines.

19. PP shall carry out plantation as per EC condition before ensuing monsoon.
20. The applicant shall make an application for renewal of consent 60 days prior to date of expiry of the consent.

. This consent is issued as per communication letter dated 03/11/2022 which is approved by competent authority of the board.

Received Consent fee of -

Sr.No	Amount(Rs.)	Transaction/DR.No.	Date	Transaction Type
1	4812280.00	MPCB-DR-17285	17/02/2023	RTGS
2	39200.00	MPCB-DR-18493	12/04/2023	RTGS

As per earlier consent No. Format1.0/CAC/UAN-130759/CR/2207001196 dated 24.07.2022, the consent fees balanced with the Board is Rs. 30,77,500/-. Industry has paid the Consent fees of Rs. 48,51,480/- with this application. Total consent fees available with the Board is Rs. 79,28,980/-. Consent fees for renewal of consent for the period up to 31.03.2024 is Rs. 16,27,956/- including consent to establish fees towards increase in CI. Now consent fees balance with the Board is Rs. 63,01,024/-which will be considered during the next renewal of consent.

Copy to:

1. Regional Officer, MPCB, Chandrapur and Sub-Regional Officer, MPCB, Chandrapur
- They are directed to ensure the compliance of the consent conditions.
2. Chief Accounts Officer, MPCB,Sion, Mumbai
3. CAC desk-for record and website updation purpose.

SCHEDULE-I

Terms & conditions for compliance of Water Pollution Control:

1. A] As per the applciation submitted, industry has provided the ETP having capacity 100 CMD.

   B] The Applicant shall operate the effluent treatment plant (ETP) to treat the trade effluent so as to achieve the following standards prescribed by the Board or under EP Act, 1986 and Rules made there under from time to time, whichever is stringent:

Sr.No	Parameters	Limiting concentration not to exceed in mg/l, except for pH
(1)	pH	5.5 to 9.0
(2)	Oil & Grease	10
(3)	BOD (3 days 27°C)	30
(4)	COD	250
(5)	Total Suspended solids	100
(6)	Total Dissolved solids	2100

   C] The treated effluent shall be recycled for secondary purposes to the maximum extent and remaining shall be discharged on land for gardening within premise after confirming above standards. In no case, effluent shall find its way to outside factory premises.

2. A] As per your application, you have provided Sewage Treatment Plant of designed capacity 5 CMD for the treatment of 4 CMD of sewage.

   B] The Applicant shall operate the sewage treatment system to treat the sewage so as to achieve the following standards.

Sr.No	Parameters	Standards (mg/l)	
1	BOD (3 days 27°C)	Not to exceed	30 mg/l
2	COD	Not to exceed	100 mg/l
3	SS	Not to exceed	50 mg/l

   C] The treated sewage shall be recycled for secondary purposes to the maximum extent and remaining shall be discharged on land for gardening within premise after confirming above standards. In no case, sewage shall find its way to outside factory premises.

3. The Board reserves its rights to review plans, specifications or other data relating to plant setup for the treatment of waterworks for the purification there of & the system for the disposal of sewage or trade effluent or in connection with the grant of any consent conditions. The Applicant shall obtain prior consent of the Board to take steps to establish the unit or establish any treatment and disposal system or an extension or addition thereto.

4. The industry shall ensure replacement of pollution control system or its parts after expiry of its expected life as defined by manufacturer so as to ensure the compliance of standards and safety of the operation thereof.

5. The Applicant shall comply with the provisions of the Water (Prevention & Control of Pollution) Act, 1974 and as amended, by installing water meters and other provisions as contained in the said act:

Sr. No.	Purpose for water consumed	Water consumption quantity (CMD)
1.	Industrial Cooling, spraying in mine pits or boiler feed	250.00
2.	Domestic purpose	10.00
3.	Processing whereby water gets polluted & pollutants are easily biodegradable	100.00
4.	Processing whereby water gets polluted & pollutants are not easily biodegradable and are toxic	0.00
5.	Gardening	40

6. The Applicant shall provide Specific Water Pollution control system as per the conditions of EP Act, 1986 and rule made there under from time to time/ Environmental Clearance/ CREP guidelines.

SCHEDULE-II

Terms & conditions for compliance of Air Pollution Control:

1. As per your application, you have provided the Air pollution control (APC) system and erected following stack (s) to observe the following fuel pattern:

Stack No.	Source	APC System provided/proposed	Stack Height(in mtr)	Type of Fuel	Sulphur Content(in %)	Pollutant	Standard
0	NA		0.00	-	-	NA	-

2. The Applicant shall provide Specific Air Pollution control equipments as per the conditions of EP Act, 1986 and rule made there under from time to time/ Environmental Clearance / CREP guidelines.
3. The Applicant shall obtain necessary prior permission for providing additional control equipment with necessary specifications and operation thereof or alteration or replacement/alteration well before its life come to an end or erection of new pollution control equipment.
4. The Board reserves its rights to vary all or any of the condition in the consent, if due to any technological improvement or otherwise such variation (including the change of any control equipment, other in whole or in part is necessary).
5. Control Equipments
   a. Coal handling plant shall provided with dust collector & automatic water sprinkler and it shall be operated continuously.
   b. Scientific spraying of water on all working area, dump area, stock piles with the help of appropriate dust suppression system.
   c. Minerals shall be properly covered during transportation.
   d. The applicant shall carry out tree plantation along road side, around dumps or compulsory afforestation as per proposal approved by Forest Department.
   e. Black topped metal roads shall be provided and it shall be well maintained to prevent dust formation.

f. Overloading of dumpers shall be avoided to prevent spillages.

g. Correct type & quantity of explosive shall be used to avoid excess dust formation & vibration in the surrounding area.

h. The slope of the over burden shall have slope not more than 28° to the horizontal. The overburden shall be properly covered by vegetation for stabilization.

i. Minerals transportation shall be done by installing conveyors wherever possible & mechanically covered closed trucks shall be used for transportation.

6. Standards for Ambient Air Pollutants:

The Suspended Particulate Matter (SPM), Respirable Particulate Matter (RPM), Sulphur dioxide (SO_2) and Oxides of Nitrogen (NO_x) concentration in downwind direction considering predominant wind direction, at a distance of 500 metres from the following dust generating sources shall not exceed the standards specified in the table given below:

Dust Generating Sources:

Loading or unloading, Haul Road, coal transportation road, Coal handling plant (CHP), Railway Sliding, Blasting, Drilling, Overburden dumps, or any other dust generating external sources like coke ovens (hard as well as soft), briquette industry, nearby road etc.

Pollutant	***Time weighted average***	***Concentration in Ambient Air***
Suspended Particulates Matter (SPM)	Annual Average	360 µg/m^3
	24 hours	500 µg/m^3
Respirable Particulate Matter (size less than 10 µm) (RPM)	Annual Average	180 µg/m^3
	24 hours	250 µg/m^3
Sulphur Dioxide (SO_2)	Annual Average	80 µg/m^3
	24 hours	120 µg/m^3
Oxides of Nitrogen as NO_x	Annual Average	80 µg/m^3
	24 hours	120 µg/m^3

i. In case of any residential or commercial or industrial place falls within 500 metres of any dust generating sources, the National Ambient Air Quality Standards notified vide MOEFCC GOI notification dtd 16.11.2009 as ammended shall be made applicable.

ii. The applicant shall provide minimum three ambient air quality monitoring stations within mining area which should be monitored for SPM, RSPM, SO_2, NOx, HC, CO etc. The Annual Arithmetic Mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval shall conform to the National Ambient Air Quality Standards prescribed under Air (Prevention and Control of Pollution) Act, 1981 and Environment (Protection) Act, 1986. The records of results of monitoring done shall be made available for inspection to the officers of the Board.

7. The applicant shall take adequate measures for control of noise levels from its own sources as follows:

Sr. No	***Location***	***Permissible Norms [in dB (A)]***	***Desired minimum thickness of green belt (m)***
1.	Along Road side	65 (Commercial Area)	20
2.	In colonies	55 (Residential Area)	20
3.	Near Opencast Mines	75 (Industrial Area)	10
4.	Near CHPs	75	30
5.	Near Shaft	75	20
6.	Near Mine exhaust fan	75	> 50

8. Other conditions:

i Whenever due to any accident or other unforeseen act or even, such emissions occur or is apprehended to occur in excess standards laid down, such information shall be forthwith reported to Board, concerned Police station, office of Directorate of Health services, Dept. of explosives, Inspectorate of Factories & Local Body. In case of failure of pollution control equipments, the production process connected to it shall be stopped.

SCHEDULE-III

Details of Bank Guarantees:

Sr. No.	***Consent (C2E/ C2O /C2R)***	***Amt of BG Imposed***	***Submission Period***	***Purpose of BG***	***Compliance Period***	***Validity Date***
1	C2R	Rs. 5.0 Lakh	15 days	Regular monitoring of ground water level and quality should be carried out by establishing the network of existing wells and constructing new piezometers during mining operations	6 Monthly	31.12.2025
2	C2R	Rs.5.0 Lakh	15 days	Catch drain and siltation ponds of appropriate size should be constructed to arrest silt and sediment flow from soil, OB and mineral dumps. Water so collected should be utilized for watering of the mining area, roads green belt developers etc.	Regular Activity	31.12.2025
3	C2R	Rs. 5.0 Lakh	15 days	Coal transportation shall be done by covered trucks. Overloading of shall be avoided to prevent spillages.	6 Months	31.12.2025
4	C2R	Rs.5.0 Lakh	15 days	Coal Handling Plant (CHP) & loading / unloading area will be provided with Dust Suppression system and Automatic Water Sprinklers	3 Months	31.12.2025
5	C2R	Rs.5.0 Lakh	15 days	Convert existing water sprinkling arrangement into chemical fogging arrangement (M_gCl2)	3 Months	31.12.2025

Sr. No.	Consent (C2E/ C2O /C2R)	Amt of BG Imposed	Submission Period	Purpose of BG	Compliance Period	Validity Date
6	C2R	Rs.5.0 Lakh	15 days	Deploying mechanized sweepers which are automated suction sweeper for cleaning the coal dust from road.	3 Months	31.12.2025
7	C2R	Rs.5.0 Lakh	15 days	To provide Mist Cannon-3 Nos- 100-meter throw with 360 deg rotation-within 3 months period	3 Months	31.12.2025
8	C2R	Rs.5.0 Lakh	15 days	Adoption and installation of tyre wash system to mining transportation at entry and exit point of mining area.	3 Months	31.12.2025
9	C2R	Rs.5.0 Lakh	15 days	Use of toppers/binders/surfactants on the top surface of coal pile on trucks carrying coal on road to minimize spillage during transportation	3 Months	31.12.2025
10	C2R	Rs.5.0 Lakh	15 days	Over burden (OB) should be stacked at earmarked dumpsites only and should not be kept active for long period. Proper terracing of OB should be carried out so that the overall slope will come down to 28°. Over Burden shall be disposed by way of backfilling.	Regular Activity	31.12.2025
11	C2R	Rs.25.0 Lakh	15 days	Towards Operation and Maintenance of pollution control system and towards compliance of consent & Environment Clearance. conditions	Regular Activity	31.12.2025

The above Bank Guarantee(s) shall be submitted by the applicant in favour of Regional Officer at the respective Regional Office within 15 days from the date of issue of Consent.

BG Forfeiture History

Srno.	Consent (C2E/C2O/C2R)	Amount of BG imposed	Submission Period	Purpose of BG	Amount of BG Forfeiture	Reason of BG Forfeiture
NA						

BG Return details

Srno.	Consent (C2E/C2O/C2R)	BG imposed	Purpose of BG	Amount of BG Returned
NA				

SCHEDULE-IV

General Conditions:

1. The applicant shall provide facility for collection of environmental samples and samples of trade and sewage effluents, air emissions and hazardous waste to the Board staff at the terminal or designated points and shall pay to the Board for the services rendered in this behalf.
2. If the MIDC pipeline is broken/ overflowing chamber, in such cases industry shall not discharge their treated effluent into MIDC drain, it shall be sent to CETP by tanker.
3. Industry should monitor effluent quality, stack emissions and ambient air quality monthly/quarterly.
4. The applicant shall provide ports in the chimney/(s) and facilities such as ladder, platform etc. for monitoring the air emissions and the same shall be open for inspection to/and for use of the Board's Staff. The chimney(s) vents attached to various sources of emission shall be designated by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.
5. Whenever due to any accident or other unforeseen act or even, such emissions occur or is apprehended to occur in excess of standards laid down, such information shall be forthwith Reported to Board, concerned Police Station, office of Directorate of Health Services, Department of Explosives, Inspectorate of Factories and Local Body. In case of failure of pollution control equipment, the production process connected to it shall be stopped.
6. The applicant shall provide an alternate electric power source sufficient to operate all pollution control facilities installed to maintain compliance with the terms and conditions of the consent. In the absence, the applicant shall stop, reduce or otherwise, control production to abide by terms and conditions of this consent.
7. The firm shall submit to this office, the 30th day of September every year, the Environmental Statement Report for the financial year ending 31st March in the prescribed Form-V as per the provisions of rule 14 of the Environment (Protection) (Second Amendment) Rules, 1992.
8. The industry shall recycle/reprocess/reuse/recover Hazardous Waste as per the provision contain in the H&OW(M&TM) Rules 2016, which can be recycled/processed/ reused/ recovered and only waste which has to be incinerated shall go to incineration and waste which can be used for land filling and cannot be recycled/ reprocessed etc. should go for that purpose, in order to reduce load on incineration and landfill site/environment.
9. The industry should comply with the Hazardous & Other Wastes (M & TM) Rules, 2016 and submit the Annual Returns as per Rule 6(5) & 20(2) of Hazardous & Other Wastes (M & TM) Rules, 2016 for the preceding year April to March in Form-IV by 30th June of every year.
10. An inspection book shall be opened and made available to the Board's officers during their visit to the applicant.
11. The applicant shall make an application for renewal of the consent at least 60 days before the date of the expiry of the consent.
12. Industry shall strictly comply with the Water (P&CP) Act, 1974, Air (P&CP) Act,1981 and Environmental Protection Act,1986 and industry specific standard under EP Rules 1986 which are available on MPCB website(www.mpcb.gov.in).
13. The industry shall constitute an Environmental cell with qualified staff/personnel/agency to see the day to day compliance of consent condition towards Environment Protection.

14. Separate drainage system shall be provided for collection of trade and sewage effluents. Terminal manholes shall be provided at the end of the collection system with arrangement for measuring the flow. No effluent shall be admitted in the pipes/sewers downstream of the terminal manholes. No effluent shall find its way other than in designed and provided collection system.
15. Neither storm water nor discharge from other premises shall be allowed to mix with the effluents from the factory.
16. The applicant shall install a separate meter showing the consumption of energy for operation of domestic and industrial effluent treatment plants and air pollution control system. A register showing consumption of chemicals used for treatment shall be maintained.
17. Conditions for D.G. Set
    a) Noise from the D.G. Set should be controlled by providing an acoustic enclosure or by treating the room acoustically.
    b) Industry should provide acoustic enclosure for control of noise. The acoustic enclosure/ acoustic treatment of the room should be designed for minimum 25 dB (A) insertion loss or for meeting the ambient noise standards, whichever is on higher side. A suitable exhaust muffler with insertion loss of 25 dB (A) shall also be provided. The measurement of insertion loss will be done at different points at 0.5 meters from acoustic enclosure/room and then average.
    c) Industry should make efforts to bring down noise level due to DG set, outside industrial premises, within ambient noise requirements by proper sitting and control measures.
    d) Installation of DG Set must be strictly in compliance with recommendations of DG Set manufacturer.
    e) A proper routine and preventive maintenance procedure for DG set should be set and followed in consultation with the DG manufacturer which would help to prevent noise levels of DG set from deteriorating with use.
    f) D.G. Set shall be operated only in case of power failure.
    g) The applicant should not cause any nuisance in the surrounding area due to operation of D.G. Set.
    h) The applicant shall comply with the notification of MoEFCC, India on Environment (Protection) second Amendment Rules vide GSR 371(E) dated 17.05.2002 and its amendments regarding noise limit for generator sets run with diesel.
18. The industry should not cause any nuisance in surrounding area.
19. The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standard in respect of noise to less than 75 dB (A) during day time and 70 dB (A) during night time. Day time is reckoned in between 6 a.m. and 10 p.m. and night time is reckoned between 10 p.m. and 6 a.m.
20. The applicant shall maintain good housekeeping.
21. The applicant shall bring minimum 33% of the available open land under green coverage/ plantation. The applicant shall submit a yearly statement by 30th September every year on available open plot area, number of trees surviving as on 31st March of the year and number of trees planted by September end
22. The non-hazardous solid waste arising in the factory premises, sweepings, etc. be disposed of scientifically so as not to cause any nuisance / pollution. The applicant shall take necessary permissions from civic authorities for disposal of solid waste.
23. The applicant shall not change or alter the quantity, quality, the rate of discharge, temperature or the mode of the effluent/emissions or hazardous wastes or control equipment provided for without previous written permission of the Board. The industry will not carry out any activity, for which this consent has not been granted/without prior consent of the Board.

24. The industry shall ensure that fugitive emissions from the activity are controlled so as to maintain clean and safe environment in and around the factory premises
25. The industry shall submit official e-mail address and any change will be duly informed to the MPCB.
26. The industry shall achieve the National Ambient Air Quality standards prescribed vide Government of India, Notification dtd. 18.11.2009 as amended.

This certificate is digitally & electronically signed.

VISVESVARAYA NATIONAL INSTITUTE OF TECHNOLOGY, NAGPUR

DEPARTMENT OF CIVIL ENGINEERING

NO.: CIVIL/CEC/493(DHL-35/Majri/Oct-23)/5600
November 22, 2023

22 NOV 2023

To,
The Area Nodal Officer (Environment)
Office of the Area General Manager, Majri Area
Post: - Kudana, Tahsil: - Bhadrawati
District: Chandrapur – 442403

Subject: Ambient Air Quality monitoring at Expansion of New Majri UG to OC Mine, Tahsil: - Bhadrawati, District: - Chandrapur.

Reference: [illegible]/2023/167 dated 27.03.2023.

Dear sir,

Please find herewith, the results of Ambient Air Quality monitoring at Expansion of New Majri UG to OC Mine, Tahsil: - Bhadrawati, District: - Chandrapur, Maharashtra in the month of October 2023 fortnightly.

A) CORE ZONE

Sr. No.	Location	Date of Sampling		Concentration (24 hourly basis µg/m³)					Environmental condition (Rainy/Windy/Cloudy/Clear sky)
		From	To	SPM	PM10	PM2.5	NOx	SOx	
				Standard for Coal Mines (As per GSR 742 (E) dated 25th September 2008)					
				500	250	—	120	120	
1	Manager Office Near Canteen	9/10/2023	10/10/2023	288	178	44	11	18	Clear sky
2	Patala Magazine Area	9/10/2023	10/10/2023	235	148	36	7	16	Clear sky
3	Manager Office Near Canteen	23/10/2023	30/10/2023	282	204	41	10	18	Clear sky
4	Patala Magazine Area	23/10/2023	30/10/2023	256	163	42	7	16	Clear sky

B) BUFFER ZONE

Sr. No.	Location	Date of Sampling		Concentration (24 hourly basis µg/m³)					Environmental condition (Rainy/Windy/Calm/Clear sky)
		From	To	SPM	PM_{10}	$PM_{2.5}$	NO_2	SO_2	
				NAAQS Standard					
				–	100	60	80	80	
1	Sawada Village	9/10/2023	10/10/2023	177	91	28	8	16	Clear sky
2	Primary Health Centre Mgri	9/10/2023	10/10/2023	122	86	24	9	12	Clear sky
3	Sawada Village	26/10/2023	28/10/2023	140	98	20	8	14	Clear sky
4	Primary Health Centre Mgri	26/10/2023	28/10/2023	80	71	24	8	15	Clear sky

22-11-23

22-11-23

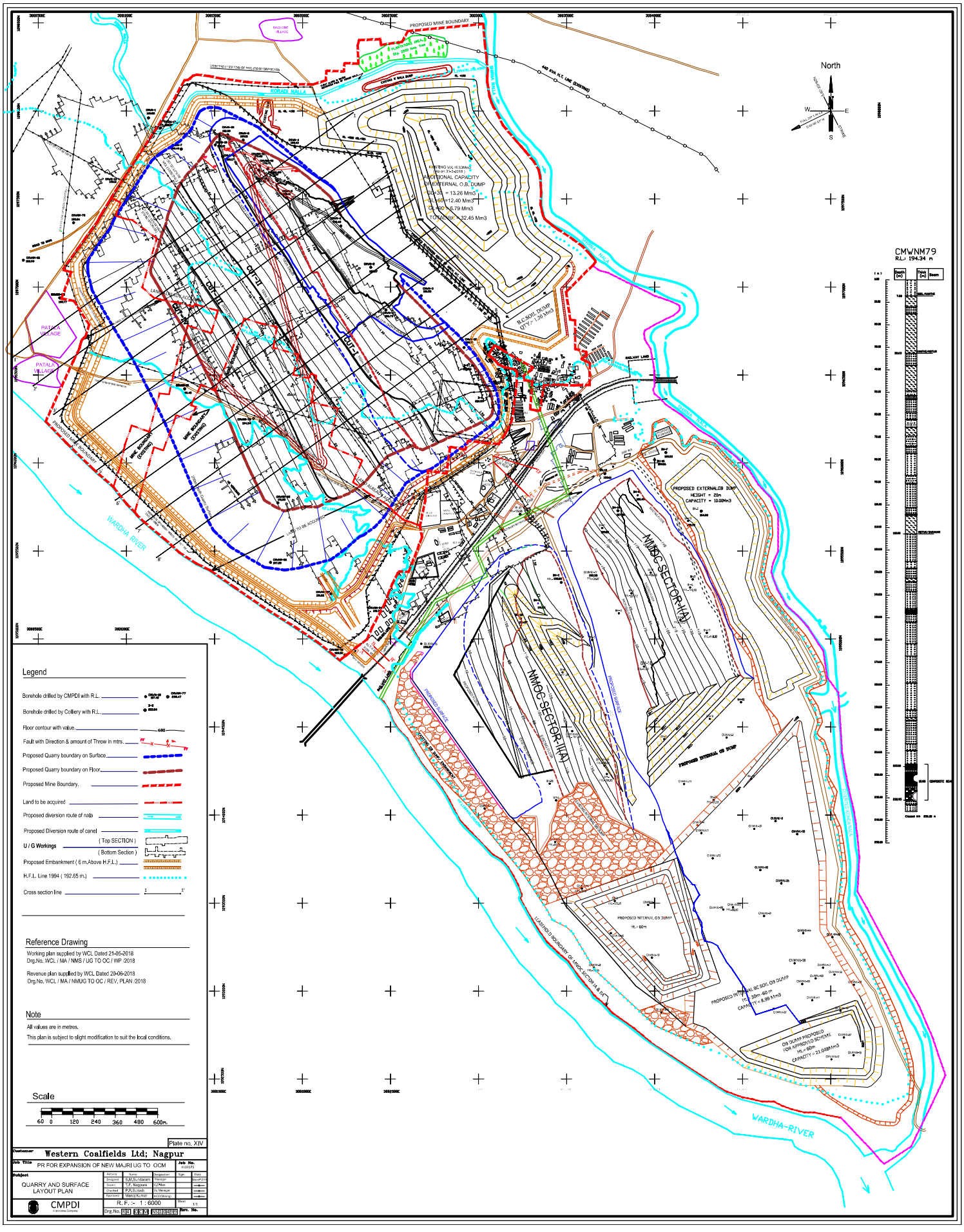
(Dilip H. Lataye)
Professor & Coordinator

(Dr. Yashwant B. Katpatal)
Professor & Head, CED

(Dr. (Mrs.) Madhuri A. Chaudhari)
Professor & Dean (R&C)

NOTE: The report has been generated on the basis of ambient sampling done on the locations mentioned at actual field conditions. The results have been analysed as per CPCB guidelines for ambient air quality monitoring, IS 5182, Part -2 (for SO_2), IS 5182 Part – 4 (for Suspended Particulate Matters, PM_{10} and $PM_{2.5}$) and IS 5182 Part – 6 (for NO_2). This report shall not form a document in any dispute/litigation.

Annexure 2


North
PROPOSED MINE BOUNDARY
KORADI NALA
WARDHA RIVER
PATALA VILLAGE
NMUG SECTOR-I(A)
NMUG SECTOR-II(A)
PROPOSED EXTERNAL OB DUMP
HEIGHT = 20m
CAPACITY = 10.00Mm3
CMWNM79
R.L.: 194.34 m
Legend
Borehole drilled by CMPDI with R.L.
Borehole drilled by Colliery with R.L.
Floor contour with value.
Fault with Direction & amount of Throw in mtrs.
Proposed Quarry boundary on Surface.
Proposed Quarry boundary on Floor.
Proposed Mine Boundary.
Land to be acquired
Proposed diversion route of nala
Proposed Diversion route of canel
U / G Workings
(Top SECTION)
(Bottom Section)
Proposed Embankment (6 m.Above H.F.L.)
H.F.L. Line 1994 (192.65 m.)
Cross section line
Reference Drawing
Working plan supplied by WCL Dated 21-05-2018
Drg.No. WCL / MA / NMS / UG TO OC / WP /2018
Revenue plan supplied by WCL Dated 20-06-2018
Drg.No. WCL / MA / NMUG TO OC / REV. PLAN /2018
Note
All values are in metres.
This plan is subject to slight modification to suit the local conditions.
Scale
60 0 120 240 360 480 600m.
Plate no. XIV
Customer Western Coalfields Ltd; Nagpur
Job Title PR FOR EXPANSION OF NEW MAJRI UG TO OCM
Job No. 1100(2)
Subject QUARRY AND SURFACE LAYOUT PLAN
Drawn S.K.Sutaravam
Checked P.P.S.Suresh
Approved Manoj Kumar
R. F. :- 1 : 6000
Sheet 1/1
CMPDI
Rev. No.

Annexure 3

वर्क ऑर्डर

01 Name of Work:-

02 Name of Agency/Contractor:-

03 Work Award Letter Number:-

04 [illegible] Letter Number:-

05 Date of [illegible]:-

07 [illegible]:-

[illegible] Job (2, Ac), Jal Nagar Ward, Near Mata Mandir, Chandauli, District – [illegible]

[illegible]

[illegible] Dated [illegible]

[illegible] Dated [illegible]

01.01.2022

06 Date of Completion:- [illegible]

[illegible] 2021-22 [illegible]

Sl. No.	PARTICULARS OF WORK	QNTY.	UNIT	RATE IN (Rs.)	AMOUNT IN (Rs.)
1.00	[illegible]	1.00	Job	4000.00 (Rupees Four Thousand Only)	4,000.00
[illegible]	[illegible]	30.00	Meter	3700.00 [illegible]	1,11,000.00
[illegible]	[illegible]	10.00	[illegible]	[illegible]	12,300.00
[illegible]	[illegible]	50.00	[illegible]	[illegible]	68,750.00

[illegible]

[illegible]

NO.				(Rs.)	IN (Rs.)
4.00	[illegible]	50.00	Meter	1995.00 (Rupees One Thousand Nine Hundred and Ninety Five Only)	99,750.00
5.00	[illegible]	50.00	Meter	2234.00 (Rupees Two Thousand Two Hundred and Thirty Four Only)	1,11,700.00
6.00	[illegible]	1.00	No	560.00 (Rupees Five Hundred and Sixty Only)	560.00
7.00	[illegible]	2.00	No	1450.00 (Rupees One Thousand Four Hundred and Fifty Only)	2,900.00
8.00	[illegible]	1.00	Each	450.00 (Rupees Four Hundred and Fifty Only)	450.00
9.00	[illegible]	2.00	No	1200.00 (Rupees One Thousand Two Hundred Only)	2,400.00
10.00	[illegible]	5.35	Cum	4215.00 (Rupees Four Thousand Two Hundred and Fifteen Only)	22,545.60
11.00	[illegible]	8.00	Hrs	2945.00 (Rupees Two Thousand Nine Hundred and Forty Five Only)	23,560.00

				(Rs.)	(Rs.)
12.00	[illegible]	1.00	No	35000.00 [illegible]	35,000.00
13.00	[illegible]	100.00	Mtr	610.00 [illegible]	61,000.00
14.00	[illegible]	105.00	Meter	135.00 [illegible]	14,595.00
15.00	[illegible]	1.30	Each	2563.00 [illegible]	2,952.00
16.00	[illegible]	150.00	Rmt	149.00 [illegible]	22,350.00
17.00	[illegible]	156.00	Sqmtr	61.00 [illegible]	9,516.00
18.00	[illegible]	3.70	Cum	135.00 [illegible]	499.50
19.00	[illegible]	0.75	Cum	200.00 [illegible]	150.00

[illegible]

[illegible]

[illegible]

				(Rs.)	IN (Rs.)
20.00	[illegible]	0.52	cum	3200.00 [illegible]	1,664.00
21.00	[illegible]	2.74	Cum	4100.00 [illegible]	11,234.00
22.00	[illegible]	465.00	Kg	34.00 [illegible]	15,810.00
23.00	[illegible]	34.00	Sqm	555.00 [illegible]	18,870.00
24.00	[illegible]	50.00	Sqm	35.00 [illegible]	1,750.00
25.00	[illegible]	275.00	Kg	72.00 [illegible]	19,800.00
26.00	[illegible]	20.00	Sqm	145.00 [illegible]	2,900.00

Total - Rs. 6,33,712.00
GST @ 18% 1,14,086.16
Total - Rs. 7,47,798.16

Rs. 6,33,712.00 and GST amount Rs. 1,14,086.16 and total value of work comes to Rs. 7,47,798.16 (Rupees Seven Lakh Forty Seven Thousand Seven Hundred & Ninety eight Paise Sixteen Only) including GST [illegible] Company)

[illegible]

Dealer (the company)

[illegible] : Head office Contd... 8/

[illegible]

New Majri UG to OC Mine
Work Done Under CER
Work Name: Construction of Tube Well
Beneficiary Village: Palasgaon

STRICTLY RESTRICTED
FOR COMPANY USE ONLY
The information given in this report is not to be communicated either directly or indirectly to the press or to any person not holding an official position in the CIL / Government

SURFACE WATER MONITORING REPORT

MAJRI AREA

WESTERN COALFIELDS LTD.

JOB NO.4634420034

QE-JUNE 2023

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102
CMPDI
REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report Surface water quality monitori

TEST REPORT NO.	RIN/TR/JUNE-23/SW21	DATE OF ISSUE	31-08-23
NAME OF CUSTOMER	GM(ENV.), WCL(HQ), NAGPUR	SAMPLE DESCRIPTION	WATER SAMPLE
NAME OF AREA	MAJRI	SAMPLING METHOD: LSOP 5	
NAME OF PROJECT	NEW MAJRI UG TO OC	SAMPLING PLAN: LQR 47	
NO. OF PAGES	1		

NAME OF LOCATION:	UP STREAM OF WARDHA RIVER W.R.T. MINE DISCHARGE			SAMPLING DATE:	22-05-23
SL. NO.	**PARAMETER**	**TEST METHOD**	**DETECTION LIMIT**	**ANALYSIS RESULT**	
1	pH Value	IS 3025 Part-11 Electrometric Method: 2017	2	7.36	
2	Colour (Hazen)	IS 3025 Part-4 Pt-Co Method: 2017	1	2	
3	TDS -mg/l	IS 3025 Part-16 Gravimetric Method: 2017	25	210	
4	Oil & Greese - mg/l	IS 3025 (Part 39): 1991 (RA 2003) Partition gravimetric Method	2	BDL	
5	Dissolved Oxygen - mg/l	IS 3025 (Part-38):1989 (RA 2003) Winkler Azide Method	0.1	4.8	
6	B.O.D. (3 days at 27°C) - mg/l	IS 3025 Part 44 : 1993 (RA 2014)	2	3	
7	Arsenic (As)-mg/l	APHA, 23rd Edition 3114 C AAS-VGA Method:2017	0.005	BDL	
8	Lead as (Pb) -mg/l	APHA, 23rd Edition 3113 B AAS GTA Method:2017	0.005	BDL	
9	Hexavalent Chromium -mg/l	APHA, 23rd Edition 3500-Cr B Colorimetric Method: 2017	0.01	BDL	
10	Copper (as Cu) -mg/l	IS 3025 Part-42 AAS Flame Method :2014	0.03	BDL	
11	Zinc as (Zn) -mg/l	IS 3025 Part-49 AAS Flame Method:2014	0.01	BDL	
12	Selenium (Se) –mg/l	APHA, 23rd Edition 3114 C AAS-VGA Method:2017	0.005	BDL	
13	Cadmium as (Cd)- mg/l	APHA, 23rd Edition 3113 B AAS GTA Method:2017	0.0005	BDL	
14	Fluoride (as F^-)- mg/l	APHA, 23rd Edition 4500-F D SPADNS Method: 2017	0.02	0.42	
15	Iron (as Fe) -mg/l	IS 3025 Part-53 AAS Flame Method:2014	0.06	BDL	
16	Nitrate Nitrogen - mg/l	APHA, 23rd Edition 4500-NO^3 B UV Spectrophotometric Method: 2017	0.5	BDL	
17	Sulphate (as SO_4^{-2}) -mg/l	APHA (23rd Edition) 4500E Turbidimetric Method:2017	2	24.6	
18	Chlorides (as Cl^-)- mg/l	IS 3025 Part-32 1988 Argentometric Method:2014	2	18	

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Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report Surface water quality monitor

TEST REPORT NO.	RIN/TR/JUNE-23/SW22	DATE OF ISSUE	31-08-23
NAME OF CUSTOMER	GM(ENV.), WCL(HQ), NAGPUR	SAMPLE DESCRIPTION	WATER SAMPLE
NAME OF AREA	MAJRI	SAMPLING METHOD: LSOP 5	
NAME OF PROJECT	NEW MAJRI UG TO OC	SAMPLING PLAN: LQR 47	
NO. OF PAGES	1		

NAME OF LOCATION:	DOWN STREAM OF WARDHA RIVER W.R.T. MINE DISCHARGE			SAMPLING DATE:	22-05-23
SL. NO.	**PARAMETER**	**TEST METHOD**	**DETECTION LIMIT**	**ANALYSIS RESULT**	
1	pH Value	IS 3025 Part-11 Electrometric Method: 2017	2	7.96	
2	Colour (Hazen)	IS 3025 Part-4 Pt-Co Method: 2017	1	3	
3	TDS -mg/l	IS 3025 Part-16 Gravimetric Method: 2017	25	340	
4	Oil & Greese - mg/l	IS 3025 (Part 39): 1991 (RA 2003) Partition gravimetric Method	2	BDL	
5	Dissolved Oxygen - mg/l	IS 3025 (Part-38):1989 (RA 2003) Winkler Azide Method	0.1	4.4	
6	B.O.D. (3 days at 27°C) - mg/l	IS 3025 Part 44 : 1993 (RA 2014)	2	2.4	
7	Arsenic (As)-mg/l	APHA, 23rd Edition 3114 C AAS-VGA Method:2017	0.005	BDL	
8	Lead as (Pb) -mg/l	APHA, 23rd Edition 3113 B AAS GTA Method:2017	0.005	BDL	
9	Hexavalent Chromium -mg/l	APHA, 23rd Edition 3500-Cr B Colorimetric Method: 2017	0.01	BDL	
10	Copper (as Cu) -mg/l	IS 3025 Part-42 AAS Flame Method :2014	0.03	BDL	
11	Zinc as (Zn) -mg/l	IS 3025 Part-49 AAS Flame Method:2014	0.01	BDL	
12	Selenium (Se) –mg/l	APHA, 23rd Edition 3114 C AAS-VGA Method:2017	0.005	BDL	
13	Cadmium as (Cd)- mg/l	APHA, 23rd Edition 3113 B AAS GTA Method:2017	0.0005	BDL	
14	Fluoride (as F^-)- mg/l	APHA, 23rd Edition 4500-F D SPADNS Method: 2017	0.02	0.92	
15	Iron (as Fe) -mg/l	IS 3025 Part-53 AAS Flame Method:2014	0.06	BDL	
16	Nitrate Nitrogen - mg/l	APHA, 23rd Edition 4500-NO^3 B UV Spectrophotometric Method: 2017	0.5	0.84	
17	Sulphate (as SO_4^{-2}) -mg/l	APHA (23rd Edition) 4500E Turbidimetric Method:2017	2	109.7	
18	Chlorides (as Cl^-)- mg/l	IS 3025 Part-32 1988 Argentometric Method:2014	2	26	

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SURFACE WATER MONITORING REPORT

MAJRI AREA

WESTERN COALFIELDS LTD.

JOB NO.4634420034

QE-SEPTEMBER 2023

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102
CMPDI
REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

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Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report Surface water quality monitoring

TEST REPORT NO.	RIN/TR/SEPT-23/SW21	DATE OF ISSUE	27-10-2023
NAME OF CUSTOMER	GM(ENV.), WCL(HQ), NAGPUR	SAMPLE DESCRIPTION	WATER SAMPLE
NAME OF AREA	MAJRI	SAMPLING METHOD: LSOP 5	
NAME OF PROJECT	NEW MAJRI UG TO OC	SAMPLING PLAN: LQR 47	
NO. OF PAGES	1		

NAME OF LOCATION:	UP STREAM OF WARDHA RIVER W.R.T. MINE DISCHARGE			SAMPLING DATE:	13-07-2023
SL. NO.	**PARAMETER**	**TEST METHOD**	**DETECTION LIMIT**	**ANALYSIS RESULT**	
1	pH Value	IS 3025 Part-11 Electrometric Method: 2017	2	7.20	
2	Colour (Hazen)	IS 3025 Part-4 Pt-Co Method: 2017	1	2	
3	TDS -mg/l	IS 3025 Part-16 Gravimetric Method: 2017	25	210	
4	Oil & Greese - mg/l	IS 3025 (Part 39): 1991 (RA 2003) Partition gravimetric Method	2	BDL	
5	Dissolved Oxygen - mg/l	IS 3025 (Part-38):1989 (RA 2003) Winkler Azide Method	0.1	8.0	
6	B.O.D. (3 days at 27°C) - mg/l	IS 3025 Part 44 : 1993 (RA 2014)	2	3.0	
7	Arsenic (As)-mg/l	APHA, 23rd Edition 3114 C AAS-VGA Method:2017	0.005	BDL	
8	Lead as (Pb) -mg/l	APHA, 23rd Edition 3113 B AAS GTA Method:2017	0.005	BDL	
9	Hexavalent Chromium -mg/l	APHA, 23rd Edition 3500-Cr B Colorimetric Method: 2017	0.01	BDL	
10	Copper (as Cu) -mg/l	IS 3025 Part-42 AAS Flame Method :2014	0.03	0.080	
11	Zinc as (Zn) -mg/l	IS 3025 Part-49 AAS Flame Method:2014	0.01	0.066	
12	Selenium (Se) –mg/l	APHA, 23rd Edition 3114 C AAS-VGA Method:2017	0.005	BDL	
13	Cadmium as (Cd)- mg/l	APHA, 23rd Edition 3113 B AAS GTA Method:2017	0.0005	BDL	
14	Fluoride (as F^-)- mg/l	APHA, 23rd Edition 4500-F D SPADNS Method: 2017	0.02	0.24	
15	Iron (as Fe) -mg/l	IS 3025 Part-53 AAS Flame Method:2014	0.06	BDL	
16	Nitrate Nitrogen - mg/l	APHA, 23rd Edition 4500-NO^3 B UV Spectrophotometric Method: 2017	0.5	1.05	
17	Sulphate (as SO_4^{-2}) -mg/l	APHA (23rd Edition) 4500E Turbidimetric Method:2017	2	47.54	
18	Chlorides (as Cl^-)- mg/l	IS 3025 Part-32 1988 Argentometric Method:2014	2	22	

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Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report Surface water quality monitor

TEST REPORT NO.	RIN/TR/SEPT-23/SW22	DATE OF ISSUE	27-10-2023
NAME OF CUSTOMER	GM(ENV.), WCL(HQ), NAGPUR	SAMPLE DESCRIPTION	WATER SAMPLE
NAME OF AREA	MAJRI	SAMPLING METHOD: LSOP 5	
NAME OF PROJECT	NEW MAJRI UG TO OC	SAMPLING PLAN: LQR 47	
NO. OF PAGES	1		

NAME OF LOCATION:	DOWN STREAM OF WARDHA RIVER W.R.T. MINE DISCHARGE			SAMPLING DATE:	13-07-2023
SL. NO.	**PARAMETER**	**TEST METHOD**	**DETECTION LIMIT**	**ANALYSIS RESULT**	
1	pH Value	IS 3025 Part-11 Electrometric Method: 2017	2	7.36	
2	Colour (Hazen)	IS 3025 Part-4 Pt-Co Method: 2017	1	3	
3	TDS -mg/l	IS 3025 Part-16 Gravimetric Method: 2017	25	200	
4	Oil & Greese - mg/l	IS 3025 (Part 39): 1991 (RA 2003) Partition gravimetric Method	2	BDL	
5	Dissolved Oxygen - mg/l	IS 3025 (Part-38):1989 (RA 2003) Winkler Azide Method	0.1	7.5	
6	B.O.D. (3 days at 27°C) - mg/l	IS 3025 Part 44 : 1993 (RA 2014)	2	4.2	
7	Arsenic (As)-mg/l	APHA, 23rd Edition 3114 C AAS-VGA Method:2017	0.005	BDL	
8	Lead as (Pb) -mg/l	APHA, 23rd Edition 3113 B AAS GTA Method:2017	0.005	BDL	
9	Hexavalent Chromium -mg/l	APHA, 23rd Edition 3500-Cr B Colorimetric Method: 2017	0.01	BDL	
10	Copper (as Cu) -mg/l	IS 3025 Part-42 AAS Flame Method :2014	0.03	0.084	
11	Zinc as (Zn) -mg/l	IS 3025 Part-49 AAS Flame Method:2014	0.01	0.082	
12	Selenium (Se) –mg/l	APHA, 23rd Edition 3114 C AAS-VGA Method:2017	0.005	BDL	
13	Cadmium as (Cd)- mg/l	APHA, 23rd Edition 3113 B AAS GTA Method:2017	0.0005	BDL	
14	Fluoride (as F^-)- mg/l	APHA, 23rd Edition 4500-F D SPADNS Method: 2017	0.02	0.28	
15	Iron (as Fe) -mg/l	IS 3025 Part-53 AAS Flame Method:2014	0.06	BDL	
16	Nitrate Nitrogen - mg/l	APHA, 23rd Edition 4500-NO^3 B UV Spectrophotometric Method: 2017	0.5	1.18	
17	Sulphate (as SO_4^{-2}) -mg/l	APHA (23rd Edition) 4500E Turbidimetric Method:2017	2	44.78	
18	Chlorides (as Cl^-)- mg/l	IS 3025 Part-32 1988 Argentometric Method:2014	2	24	

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DRINKING WATER MONITORING REPORT

MAJRI AREA

WESTERN COALFIELDS LTD.

JOB NO.4094423068

QE-JUNE 2023

Environment Laboratory
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REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

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Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report Drinking water quality monitoring data

TEST REPORT NO.	RIN/TR/JUNE-23/DW33	DATE OF ISSUE	31-07-23
NAME OF CUSTOMER	GM(ENV.), WCL(HQ), NAGPUR	SAMPLE DESCRIPTION	WATER SAMPLE
NAME OF AREA	MAJRI	SAMPLING METHOD: LSOP 5	
NAME OF PROJECT	NEW MAJRI UG TO OC	SAMPLING PLAN: LQR 47	
NO. OF PAGES	2		

NAME OF LOCATION:	FILTER PLANT			SAMPLING DATE:	08-05-23	
					IS 10500:2012	
SL. NO.	PARAMETER	TEST METHOD	DETECTION LIMIT	ANALYSIS RESULT	REQUIREMENT (ACCEPTABLE LIMIT)	PERMISSIBLE LIMIT IN THE ABSENCE OF ALTERNATE SOURCE
1	Colour (Hazen)	IS 3025 Part-4 Pt-Co Method: 2017	1	2	5	15
2	Odour	IS 3025 Part-5:2014	Qualitative	Unobjectionable	Agreeable	Agreeable
3	Turbidity (NTU)	IS 3025 Part-10 Neplometric Method: 2012	1	3	1	5
4	pH Value	IS 3025 Part-11 Electrometric Method: 2017	2	7.76	6.5 to 8.5	No relaxation
5	Total Hardness (as $CaCO_3$) - mg/l	IS 3025 Part-21 EDTA Metod: 2014	4	216	200	600
6	Iron (as Fe) -mg/l	IS 3025 Part-53 AAS Flame Method:2014	0.06	BDL	0.3	No relaxation
7	Chlorides (as Cl^-)- mg/l	IS 3025 Part-32 1988 Argentometric Method:2014	2	36	250	1000
8	Residual Chlorine -mg/l	APHA, 23rd Edition 4500-G DPD Colorometric method: 2017	0.02	BDL	0.2	1
9	Fluoride (as F^-)- mg/l	APHA, 23rd Edition 4500-F D SPADNS Method: 2017	0.02	1.28	1	1.5
10	TDS -mg/l	IS 3025 Part-16 Gravimetric Method: 2017	25	450	500	2000
11	Calcium (as Ca) -mg/l	IS 3025 Part-40 : 2014	1.6	30.40	75	200
12	Magnesium (as Mg) -mg/l	APHA (23rd Ed.) 3500 B, Calculation Method:2017	3	39.8	30	100
13	Copper (as Cu) -mg/l	IS 3025 Part-42 AAS Flame Method :2014	0.03	BDL	0.05	1.5
14	Manganese as (Mn)- mg/l	IS 3025 Part-59, AAS Flame Method: 2006	0.02	BDL	0.1	0.3
15	Sulphate (as SO_4^{-2}) -mg/l	APHA (23rd Edition) 4500E Turbidimetric Method:2017	2	62	200	400
16	Nitrates (as NO3) - mg/l	APHA (23rd Edition) 4500-NO3-B UV Spectrophotometric	0.5	9.12	45	No relaxation
17	Cadmium as (Cd)- mg/l	APHA, 23rd Edition 3113 B AAS GTA Method:2017	0.0005	BDL	0.003	No relaxation

18	Lead as (Pb) -mg/l	APHA, 23rd Edition 3113 B AAS GTA Method:2017	0.005	BDL	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 23rd Edition 3114 C AAS-VGA Method:2017	0.005	BDL	0.01	No relaxation
20	Arsenic (As)-mg/l	APHA, 23rd Edition 3114 C AAS-VGA Method:2017	0.005	BDL	0.05	No relaxation

21	Zinc as (Zn) -mg/l	IS 3025 Part-49 AAS Flame Method:2014	0.01	BDL	5	15
22	Total Chromium -mg/l	IS 3025 Part-52 Clause 6, AAS Flame Method:2014	0.03	BDL	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 23rd Edition 4500 B-C Carmine Method:2017	0.002	BDL	0.5	1
24	Alkalinity -mg/l	IS 3025 Part-23:2014	4	156	200	600
25	Nickel-mg/l	APHA, 23rd Edition 3113 B AAS FLAME Method:2017	0.005	BDL	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA (23rd Edition) 3113B AAS-GTA Method:2017	0.005	BDL	0.1	0.2

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Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report Drinking water quality monitoring data

TEST REPORT NO.	RIN/TR/JUNE-23/DW34	DATE OF ISSUE	31-07-23
NAME OF CUSTOMER	GM(ENV.), WCL(HQ), NAGPUR	SAMPLE DESCRIPTION	WATER SAMPLE
NAME OF AREA	MAJRI	SAMPLING METHOD: LSOP 5	
NAME OF PROJECT	NEW MAJRI UG TO OC	SAMPLING PLAN: LQR 47	
NO. OF PAGES	2		

NAME OF LOCATION:	EKTA NAGAR COLONY			SAMPLING DATE:	08-05-23	
					IS 10500:2012	
SL. NO.	PARAMETER	TEST METHOD	DETECTION LIMIT	ANALYSIS RESULT	REQUIREMENT (ACCEPTABLE LIMIT)	PERMISSIBLE LIMIT IN THE ABSENCE OF ALTERNATE SOURCE
1	Colour (Hazen)	IS 3025 Part-4 Pt-Co Method: 2017	1	2	5	15
2	Odour	IS 3025 Part-5:2014	Qualitative	Unobjectionable	Agreeable	Agreeable
3	Turbidity (NTU)	IS 3025 Part-10 Neplometric Method: 2012	1	3	1	5
4	pH Value	IS 3025 Part-11 Electrometric Method: 2017	2	8.15	6.5 to 8.5	No relaxation
5	Total Hardness (as $CaCO_3$) - mg/l	IS 3025 Part-21 EDTA Metod: 2014	4	116	200	600
6	Iron (as Fe) -mg/l	IS 3025 Part-53 AAS Flame Method:2014	0.06	BDL	0.3	No relaxation
7	Chlorides (as Cl^-)- mg/l	IS 3025 Part-32 1988 Argentometric Method:2014	2	28	250	1000
8	Residual Chlorine -mg/l	APHA, 23rd Edition 4500-G DPD Colorometric method: 2017	0.02	BDL	0.2	1
9	Fluoride (as F^-)- mg/l	APHA, 23rd Edition 4500-F D SPADNS Method: 2017	0.02	1.12	1	1.5
10	TDS -mg/l	IS 3025 Part-16 Gravimetric Method: 2017	25	220	500	2000
11	Calcium (as Ca) -mg/l	IS 3025 Part-40 : 2014	1.6	27.20	75	200
12	Magnesium (as Mg) -mg/l	APHA (23rd Ed.) 3500 B, Calculation Method:2017	3	9.72	30	100
13	Copper (as Cu) -mg/l	IS 3025 Part-42 AAS Flame Method :2014	0.03	BDL	0.05	1.5
14	Manganese as (Mn)- mg/l	IS 3025 Part-59, AAS Flame Method: 2006	0.02	BDL	0.1	0.3
15	Sulphate (as SO_4^{-2}) -mg/l	APHA (23rd Edition) 4500E Turbidimetric Method:2017	2	56	200	400
16	Nitrates (as NO3) - mg/l	APHA (23rd Edition) 4500-NO3-B UV Spectrophotometric	0.5	12.10	45	No relaxation
17	Cadmium as (Cd)- mg/l	APHA, 23rd Edition 3113 B AAS GTA Method:2017	0.0005	BDL	0.003	No relaxation

18	Lead as (Pb) -mg/l	APHA, 23rd Edition 3113 B AAS GTA Method:2017	0.005	BDL	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 23rd Edition 3114 C AAS-VGA Method:2017	0.005	BDL	0.01	No relaxation
20	Arsenic (As)-mg/l	APHA, 23rd Edition 3114 C AAS-VGA Method:2017	0.005	BDL	0.05	No relaxation

DRINKING WATER MONITORING REPORT

MAJRI AREA

WESTERN COALFIELDS LTD.

JOB NO.4094423068

QE-SEPTEMBER 2023

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Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report Drinking water quality monito[redacted]

TEST REPORT NO.	RIN/TR/SEPT-23/DW33	DATE OF ISSUE	27-10-2023
NAME OF CUSTOMER	GM(ENV.), WCL(HQ), NAGPUR	SAMPLE DESCRIPTION	WATER SAMPLE
NAME OF AREA	MAJRI	SAMPLING METHOD: LSOP 5	
NAME OF PROJECT	NEW MAJRI UG TO OC	SAMPLING PLAN: LQR 47	
NO. OF PAGES	2		

NAME OF LOCATION:	FILTER PLANT				SAMPLING DATE:	13-07-2023
					IS 10500:2012	
SL. NO.	PARAMETER	TEST METHOD	DETECTION LIMIT	ANALYSIS RESULT	REQUIREMENT (ACCEPTABLE LIMIT)	PERMISSIBLE LIMIT IN THE ABSENCE OF ALTERNATE SOURCE
1	Colour (Hazen)	IS 3025 Part-4 Pt-Co Method: 2017	1	3	5	15
2	Odour	IS 3025 Part-5:2014	Qualitative	Unobjectionable	Agreeable	Agreeable
3	Turbidity (NTU)	IS 3025 Part-10 Neplometric Method: 2012	1	2	1	5
4	pH Value	IS 3025 Part-11 Electrometric Method: 2017	2	7.45	6.5 to 8.5	No relaxation
5	Total Hardness (as $CaCO_3$) - mg/l	IS 3025 Part-21 EDTA Metod: 2014	4	140	200	600
6	Iron (as Fe) -mg/l	IS 3025 Part-53 AAS Flame Method:2014	0.06	BDL	0.3	No relaxation
7	Chlorides (as Cl^-)- mg/l	IS 3025 Part-32 1988 Argentometric Method:2014	2	24	250	1000
8	Residual Chlorine -mg/l	APHA, 23rd Edition 4500-G DPD Colorometric method: 2017	0.02	0.042	0.2	1
9	Fluoride (as F^-)- mg/l	APHA, 23rd Edition 4500-F D SPADNS Method: 2017	0.02	0.54	1	1.5
10	TDS -mg/l	IS 3025 Part-16 Gravimetric Method: 2017	25	270	500	2000
11	Calcium (as Ca) -mg/l	IS 3025 Part-40 : 2014	1.6	32	75	200
12	Magnesium (as Mg) -mg/l	APHA (23rd Ed.) 3500 B, Calculation Method:2017	3	14.58	30	100
13	Copper (as Cu) -mg/l	IS 3025 Part-42 AAS Flame Method :2014	0.03	BDL	0.05	1.5
14	Manganese as (Mn)- mg/l	IS 3025 Part-59, AAS Flame Method: 2006	0.02	BDL	0.1	0.3
15	Sulphate (as SO_4^{-2}) -mg/l	APHA (23rd Edition) 4500E Turbidimetric Method:2017	2	62.18	200	400
16	Nitrates (as NO3) - mg/l	APHA (23rd Edition) 4500-NO3-B UV Spectrophotometric	0.5	4.95	45	No relaxation
17	Cadmium as (Cd)- mg/l	APHA, 23rd Edition 3113 B AAS GTA Method:2017	0.0005	BDL	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 23rd Edition 3113 B AAS GTA Method:2017	0.005	BDL	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 23rd Edition 3114 C AAS-VGA Method:2017	0.005	BDL	0.01	No relaxation
20	Arsenic (As)-mg/l	APHA, 23rd Edition 3114 C AAS-VGA Method:2017	0.005	BDL	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS 3025 Part-49 AAS Flame Method:2014	0.01	BDL	5	15
22	Total Chromium -mg/l	IS 3025 Part-52 Clause 6, AAS Flame Method:2014	0.03	BDL	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 23rd Edition 4500 B-C Carmine Method:2017	0.002	BDL	0.5	1
24	Alkalinity -mg/l	IS 3025 Part-23:2014	4	80	200	600
25	Nickel-mg/l	APHA, 23rd Edition 3113 B AAS FLAME Method:2017	0.005	BDL	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA (23rd Edition) 3113B AAS-GTA Method:2017	0.005	BDL	0.1	0.2

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TEST REPORT NO.	RIN/TR/SEPT-23/DW34	DATE OF ISSUE	27-10-2023
NAME OF CUSTOMER	GM(ENV.), WCL(HQ), NAGPUR	SAMPLE DESCRIPTION	WATER SAMPLE
NAME OF AREA	MAJRI	SAMPLING METHOD: LSOP 5	
NAME OF PROJECT	NEW MAJRI UG TO OC	SAMPLING PLAN: LQR 47	
NO. OF PAGES	2		

NAME OF LOCATION:	EKTA NAGAR COLONY			SAMPLING DATE:	13-07-2023	
					IS 10500:2012	
SL. NO.	PARAMETER	TEST METHOD	DETECTION LIMIT	ANALYSIS RESULT	REQUIREMENT (ACCEPTABLE LIMIT)	PERMISSIBLE LIMIT IN THE ABSENCE OF ALTERNATE SOURCE
1	Colour (Hazen)	IS 3025 Part-4 Pt-Co Method: 2017	1	2	5	15
2	Odour	IS 3025 Part-5:2014	Qualitative	Unobjectionable	Agreeable	Agreeable
3	Turbidity (NTU)	IS 3025 Part-10 Neplometric Method: 2012	1	3	1	5
4	pH Value	IS 3025 Part-11 Electrometric Method: 2017	2	6.86	6.5 to 8.5	No relaxation
5	Total Hardness (as $CaCO_3$) - mg/l	IS 3025 Part-21 EDTA Metod: 2014	4	200	200	600
6	Iron (as Fe) -mg/l	IS 3025 Part-53 AAS Flame Method:2014	0.06	BDL	0.3	No relaxation
7	Chlorides (as Cl^-)- mg/l	IS 3025 Part-32 1988 Argentometric Method:2014	2	62	250	1000
8	Residual Chlorine -mg/l	APHA, 23rd Edition 4500-G DPD Colorometric method: 2017	0.02	0.074	0.2	1
9	Fluoride (as F^-)- mg/l	APHA, 23rd Edition 4500-F D SPADNS Method: 2017	0.02	0.46	1	1.5
10	TDS -mg/l	IS 3025 Part-16 Gravimetric Method: 2017	25	380	500	2000
11	Calcium (as Ca) -mg/l	IS 3025 Part-40 : 2014	1.6	40	75	200
12	Magnesium (as Mg) -mg/l	APHA (23rd Ed.) 3500 B, Calculation Method:2017	3	24.3	30	100
13	Copper (as Cu) -mg/l	IS 3025 Part-42 AAS Flame Method :2014	0.03	BDL	0.05	1.5
14	Manganese as (Mn)- mg/l	IS 3025 Part-59, AAS Flame Method: 2006	0.02	BDL	0.1	0.3
15	Sulphate (as SO_4^{-2}) -mg/l	APHA (23rd Edition) 4500E Turbidimetric Method:2017	2	82.76	200	400
16	Nitrates (as NO3) - mg/l	APHA (23rd Edition) 4500-NO3-B UV Spectrophotometric	0.5	2.37	45	No relaxation
17	Cadmium as (Cd)- mg/l	APHA, 23rd Edition 3113 B AAS GTA Method:2017	0.0005	BDL	0.003	No relaxation
18	Lead as (Pb) -mg/l	APHA, 23rd Edition 3113 B AAS GTA Method:2017	0.005	BDL	0.01	No relaxation
19	Selenium (Se) –mg/l	APHA, 23rd Edition 3114 C AAS-VGA Method:2017	0.005	BDL	0.01	No relaxation
20	Arsenic (As)-mg/l	APHA, 23rd Edition 3114 C AAS-VGA Method:2017	0.005	BDL	0.05	No relaxation
21	Zinc as (Zn) -mg/l	IS 3025 Part-49 AAS Flame Method:2014	0.01	BDL	5	15
22	Total Chromium -mg/l	IS 3025 Part-52 Clause 6, AAS Flame Method:2014	0.03	BDL	0.05	No relaxation
23	Boron as (B) -mg/l	APHA, 23rd Edition 4500 B-C Carmine Method:2017	0.002	BDL	0.5	1
24	Alkalinity -mg/l	IS 3025 Part-23:2014	4	140	200	600
25	Nickel-mg/l	APHA, 23rd Edition 3113 B AAS FLAME Method:2017	0.005	BDL	0.02	No relaxation
26	Aluminum (Al)-mg/l	APHA (23rd Edition) 3113B AAS-GTA Method:2017	0.005	BDL	0.1	0.2

BDL: BELOW DETECTION LIMIT

SCIENTIFIC ASSISTANT

DEEPANSHU SAHU

AUTHORIZED SIGNATORY

1 This Report refers to the values related to the items tested.

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WESTERN COALFIELDS LIMITED

(Majri Area)

NEW MAJRI UG TO OPENCAST MINE

Plantation includes the mix of medicinal tree species, timber tree species, Ornamental tree species and fruit bearing species (Arjun, neem, karanj, Nilgiri , Sisoo, Peltaform, Gulmohar, Kasia, Jamun, Mango, Bel etc.)

Plantation along Mine Boundary

PLANTATIONS

- Plantation has been undertaken in the mine area as mitigation measure against air pollution, noise pollution and to increase the aesthetic value.
- Currently 34 ha of ML area in safety zone has been planted (with 85000 saplings, 2500 sapling/ha) and 22 ha of top soil dumps has been planted (with 55000 saplings, by Madhya Pradesh Rajya Van Vikas Nigam Ltd with local plant species such as Arjun, Neem, Karanj, Nilgiri, Sisoo, Gulmohar, Kesia, Jamun, Mango, Bel etc.

Existing Plantation Details

Year	Area Planted (in ha)	Saplings Planted
2016-17	8	20000
2018-19	6	15000
2019-20	6	15000
2021-22	20	50000
2022-23	16	40000
Total	56	1,40,000

Plantation at New Majri UG to OC (2019-20)

PLANTATIONS

- Total 234.34 ha (33%) area will be planted till the end of mine life.
- The plantation will act as green barrier and tool for air pollution control. The width of the existing green barrier of 34 ha varies from 50 m to 160 m.

Year-wise Status of Plantation done is 2016-17

Initial Status

After two years

After three years

Survival rate is more than 75 % for the plantation

WESTERN COALFIELDS LIMITED

(Majri Area)

NEW MAJRI UG TO OPENCAST MINE

Plantation along Mine Boundary

AVENUE PLANTATION

AVENUE PLANTATION ROAD SIDE AND RAILWAY SIDING

Air Pollution Control Measures

- Installation of Fixed Sprinklers / Rain Guns at / along / around the dust generating sources viz Haul roads, Stock yard, Railway siding, Coal Handling Plants etc.
- Mobile Mist/ Fogg Cannons, Water Sprinklers deployed along haul roads & other transportation roads
- Black-topping of Roads, tarpaulin covering of trucks and road side avenue plantation is undertaken.
- Tree Plantation as Green belt

Dust Suppression Measures To Control Dust Emissions

Name of the Mine	Fixed Sprinklers / Rain Guns	Location	Mobile Tankers (Nos)
New Majri UG to OC	42	CHP, Coal transportation road, Way bridge	04

- 3 Nos. Trolley Mounted Mist Foggers
- 42 no of sprinklers are provided along Coal transport road, approach road to weighbridge and Coal stock yard.
- Mist spray arrangement at Mobile Crushers
- 10 nos. of Rain guns are provided in railway Siding
- Side cladding provided at Mobile Crusher

Air Quality Pollution Mitigation Measures

Blanketing of exposed coal face by overburden

- The existing New Majri UG to OC is conversion of underground mine into the opencast coal mine.
- The underground mining operations have involved development in two sections of 3m each by Bord & Pillar method and depillaring by split & stowing or slicing & stowing.
- The face of underground galleries containing coal is opened up, leading to free flow of air inside.
- As the fires got exposed to the open air, its speedy spread becomes an issue.
- Coal face are being blanketed by overburden material to prevent fire in exposed coal galleries. Blanketing of coal face will be continued during the expansion also as required.

Dust Suppression Measures To Control Dust Emissions

Fixed Water Sprinklers at Coal Stockyard

Air Quality Pollution Mitigation Measures

Fixed Sprinklers at Coal Stockyard

Mobile Water Sprinkler

Dust Suppression Measures To Control Dust Emissions

Trolley Mounted Mist Fogger Canon System: 3 nos.

LOCATION	Nos.
MOBILE CRUSHER 1	1
MOBILE CRUSHER 2	1
RAILWAY SIDING	1

WESTERN COALFIELDS LIMITED

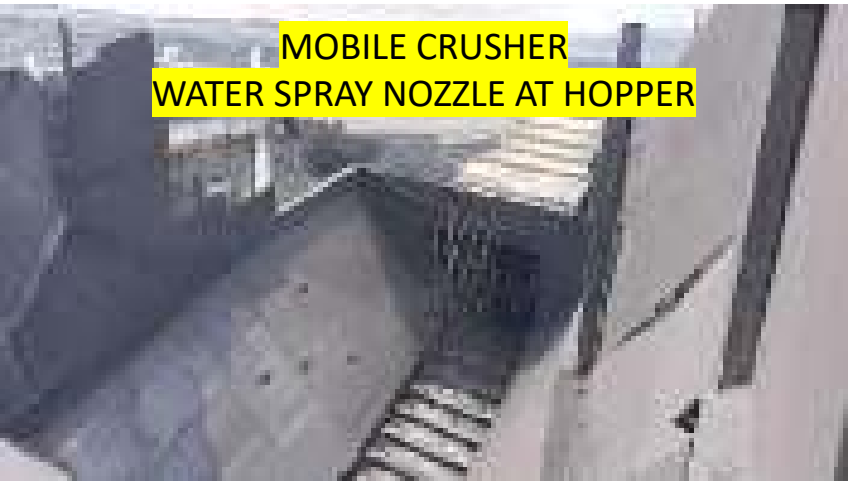
(Majri Area)

NEW MAJRI UG TO OPENCAST MINE

Mist Spray & Wetting of Coal on conveyor Arrangements in Mobile Crusher

NEW MAJRI UG TO OC MINE : FIXED & MIST SPRINKLERS

COAL STOCKYARD (06 nos.: 30 mtrs throw: 180 deg rotation



MOBILE CRUSHER
WATER SPRAY NOZZLE AT HOPPER

MOBILE CRUSHER

WATER SPRAY NOZZLE AT CONVEYOR BELT

MIST SPRAY ARRANGEMENT IN MOBILE CRUSHER

STATUS OF DUST BARRIER

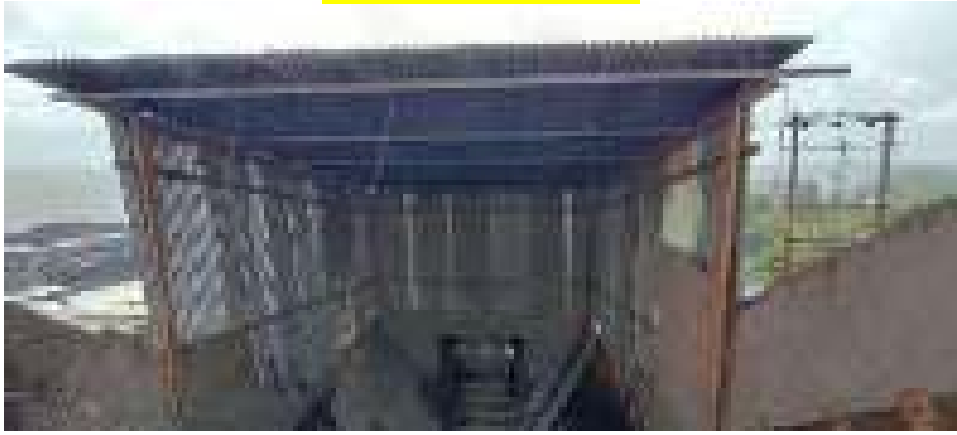
AREA COVERED	HEIGHT	LENGTH	REMARKS
RAILWAY SIDING	10 FEET	300 MTRS	FROM SCRAP SHEETING

DUST BARRIER FOR RAILWAY SIDING
HEIGHT: 10 FTS, TOTAL LENGTH: 300 mtrs

STATUS OF SHEETING OF CHP & MOBILE CRUSHERS

BELT CURTAINS AT DISCHARGE POINT OF NMOC CHP

GI SHEETING ENCLOSURE FOR MOBILE CRUSHERS NMUG TO OC MINE



Continuous Ambient Air Quality Monitoring Station (CAAQMS) at New Majri UG to OC

CAAQMS Building

Display Board

Computer for report generation

Analyzer Racks

ROOF MOUNTED SAMPLING UNIT & WEATHER ANALYSERS

CAAQMS Data

PYE MONTH WISE REPORT - 2023 (JANUARY TO DECEMBER 2023)

NAME OF PTW	JAN 2023	FEB 2023	MARCH 2023	APRIL 2023	MAY 2023	JUNE 2023	JULY 2023	AUG 2023	SEP 2023	OCT 2023	NOV 2023	DEC 2023	TOTAL
[illegible]	[illegible]	16	19	[illegible]	[illegible]	27	[illegible]	07	28	16	30	11	185
[illegible]	47	38	69	29	34	42	[illegible]	19	07	36	18	19	347
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	13	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
TOTAL	[illegible]	[illegible]	[illegible]	[illegible]	54	[illegible]	[illegible]	[illegible]	37	[illegible]	[illegible]	41	618

PYE MONTH WISE REPORT - 2023 (JANUARY TO DECEMBER 2023)

	JAN 2023	FEB 2023	MARCH 2023	APRIL 2023	MAY 2023	JUNE 2023	JULY 2023	AUG 2023	SEP 2023	OCT 2023	NOV 2023	DEC 2023	TOTAL
PYE	03	03	11	01	70	05	49	63	41	26	141	15	456

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]											
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]											
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]											
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]											
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]											
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]											
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]											
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]											
Total	[illegible]	[illegible]	[illegible]	[illegible]											

[illegible]

	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										

WCL MAJRI AREA HOSPITAL

PME-IME REPORT 2018-19

UNIT WISE PME STATUS

UNIT	PME
NEW MAJRI II A OC MINE	190
NEW MAJRI UG TO OC MINE	182
YEKONA OC MINE	34
AHQ	52
NAVIN KUNADA OC MINE	09
JUNA KUNADA OC MINE	02
TELWASA OC MINE	76
DHORWASA OC MINE	06
AREA STORES	00
TOTAL	651
PME BELOW 45 YRS OF AGE	83
PME ABOVE 45 YRS OF AGE	568

DEPARTMENTAL EMPLOYEE IME STATUS

IME WCL MAJRI AREA	67

CONTRACTOR WISE IME DETAILS

NAME OF CONTRACTOR 2018	IME
MAHALAXMI CONT.NMOC MINE	52
MANSA TRAVELS AREA SECURITY OFFICE/ MA	3
HANSA TRAVELS ASO/MA	2
HANSA TRAVELS NMOC	14
SUHANI TRAVELS YEKONA	4
SHIVAM TRAVELS NMUG TO OC	2
SURODAY CONT NMOC	56
KING TRAVELS TOC	2
KANDALA CONT YEKONA	75
SUHANI TRAVELS NMUG TO OC	1
MANSA TRAVELS YEKONA	6
SHANKAR TOTAWAR TOC	8
HANSA TRAVEL YEKONA	1
KINGS TRAVEL YEKONA	2
SANJAY TRAVELS TOC	2
HANSA TRAVELS JKOC	1
KING TRAVELS GM/MA	2
K.BAPU CIVIL YEKONA	2
MANSA TRAVELS	8

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SHIVAM TRAVELS NMOC	1
DASMESH CONT.NMOC	5
RAJ TRAVELS NMOC	2
SANJIP SINGH TRAVELS NMOC	1
SHRI BALAJI TRAVELS YEKONA	1
GANESH D CHAWALE CONT.YEKONA	4
R.K.DIESEL CONT.YEKONA YEKONA	1
MANGALAM BUS CONT. NMOC	2
HANSA TRAVELS NMUG TO CC	2
TOTAL	263

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PME-IME REPORT 2019-20

UNIT WISE PME STATUS

UNIT	PME
NEW MAJRI U A OC MINE	361
NEW MAJRI UG TO OC MINE	183
YEKONA OC MINE	47
AHQ	75
NAVIN KUNADA OC MINE	04
JUNA KUNADA OC MINE	06
TELWASA OC MINE	33
DHORWASA OC MINE	01
AREA STORES	00
TOTAL	710
PME BELOW 45 YRS OF AGE	148
PME ABOVE 45 YRS OF AGE	562

DEPARTMENTAL EMPLOYEE IME STATUS

IME WCL MAJRI AREA	49

CONTRACTOR WISE IME DETAILS

NAME OF CONTRACTOR 2019	IME
SHIV TRAVELS NMOC MINE	03
MAHALAXMI CONT NMOC MINE	55
GANESH CHAWALE YEKONA MINE	01
VIMAL CHAWALE NMOC MINE	06
KANDLA CONT YEKONA MINE	174
COAL TESTING LABORATORY/MA	01
KING TRAVELS CONT YEKONA	00
MANSA TRAVELS CONT NMOC	03
MANSA TRAVELS CONT YEKONA MINE	02
K BAPU CONT YEKONA	03
HANSA TRAVELS UG TO OC	04
SONU TRAVLLES YEKONA	12
CALIBER MERCONTI CONT YEKONA	06
M/S KULDEEP PRASAD SINGH	07
SURYODAY CONT NMOC	75

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SHREE BALAJI TRAVELS YEKONA	03
SUHANI TRAVELS YEKONA	02
GLOBE TRANSPORT CONT UG TO OC	09
AWATAR SING CONT UG TO OC	51
MEHBOB TRAVELS UG TO OC	01
SHREE BALAJI TRAVELS NMOC	02
SRP-UHALPL-JV CONT UG TO OC	04
RAKESH KUMAR SINGH YEKONA	01
TOTAL	**377**

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Majri Area, WCL

WCL MAJRI AREA HOSPITAL

PME-IME REPORT 2020-21

UNIT WISE PME STATUS

UNIT	PME
NEW MAJRI U/G OC MINE	175
NEW MAJRI UG TO OC MINE	210
YEKONA OC MINE	49
AHQ	11
NAVIN BUNADA OC MINE	04
JUNA BUNADA OC MINE	01
TELWASA OC MINE	21
DHORWASA OC MINE	00
AREA STORES	00
TOTAL	498
PME BELOW 45 YRS OF AGE	154
PME ABOVE 45 YRS OF AGE	344

DEPARTMENTAL EMPLOYEE IME STATUS

IME WCL MAJRI AREA	16

CONTRACTOR WISE IME DETAILS

NAME OF CONTRACTOR 2020	IME
SURODAY CONT NMOC MINE	02
MAHALAXMI CONT NMOC MINE	01
SUHANI TRAVELS CONT YEKONA	05
KANDALA CONT YEKONA MINE	151
NAGRAJ TRAVELS CONT YEKONA	02
K BAPU CONT JEOC MINE	09
SHRI BALAJI TRAVELS CONT YEKONA	01
HARIRAM GONARA CONT YEKONA	58
HAPPY TOURS & TRAVELS ASO/MA	01
GANESH DIAWALE TRAVELS YEKONA	01
HANSA TRAVELS CONT NMOC MINE	01
SHIVAM TRAVELS CONT YEKONA	03
SHIVAM TRAVELS CONT YEKONA UG TO OC	01
DOTECNA CONT AHQ MA	09
SRP UTALFIV CONT UG TO OC MINE	03
AWATAR SINGH JAWALI CONT UG TO OC MINE	04
GLOBAL TRAVELS CONT UG TO OC MINE	01
TOTAL	254

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Majri Area, WCL

WCL MAJRI AREA HOSPITAL

PME-IME REPORT 2021-22

UNIT WISE PME STATUS

UNIT	PME
NEW MAJRI I & OC MINE	163
NEW MAJRI UG TO OC MINE	195
AMNEG. YEKONA I & II OC MINE	59
AHCL	00
NAVIN KUNADA OC MINE	10
JUNA KUNADA OC MINE	00
TELWASA OC MINE	17
DHORWASA OC MINE	00
AREA STORES	00
TOTAL	**463**
PME BELOW 45 YRS OF AGE	129
PME ABOVE 45 YRS OF AGE	334

DEPARTMENTAL EMPLOYEE IME STATUS

IME WCL MAJRI AREA	33

CONTRACTOR WISE IME DETAILS

NAME OF CONTRACTOR	IME
SHIVAM TRAVELS CONT UG TO OC MINE	01
SHREE ENTERPRISES CONT NMOC MINE	01
HANSA TRAVELS CONT NMOC MINE	02
BALAJI TRAVELS CONT NMSA	01
KARAMJEET SINGH CONT NMOC MINE	35
MANSA TRAVELS CONT HANSA UG TO OC MINE	01
COTECNA INSPECTION TESTING LAB MAJRI CONT AKC(OC) MA	23
MEHBOOB CONT.UG TO OC MINE	2
M/S SINGH SHREE ENTERPRISES DY GM/MA	02
SSP-JV-ALPL-JV CONT UG TO OC MINE	04
MAMERS AVINASH LOGISTICS PVT LTD MA	06
M/S SINGH CONSTRUCTION CONT SAE/NMSA	05
MAMERS HANSA TRAVELS CONT UG TO OC	01
SHIVAM TRAVELS CONT YEKONA MINE	01
TOTAL	**80**

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Annexure 10

	CAMP	DATE	VILLAGE	
[illegible]	Mega health camp	[illegible]/[illegible]/19	Manguano	
[illegible]	General Health camp	[illegible]/[illegible]/19	Kowdiya	
[illegible]	Mega specs distribution school [illegible]	[illegible]/[illegible]/19	[illegible]	Total: [illegible]
[illegible]	Eye checkup Camp	[illegible]/[illegible]/19	[illegible] High	
[illegible]	Free Health checkup Camp	[illegible]/[illegible]/19	Madhavi [illegible] School Gondahanda village	
	2019			
[illegible]	Free health checkup Camp	[illegible]/[illegible]/19	[illegible] village	
[illegible]	Mega Health checkup Camp	[illegible]/[illegible]/19	[illegible] village	
[illegible]	do	[illegible]/[illegible]/19	[illegible]	
[illegible]	do	[illegible]/[illegible]/19	[illegible] village	
[illegible]	Free health check up Camp	[illegible]/[illegible]/19	[illegible] village	
[illegible]	Free Spectacles distribution Camp	[illegible]/[illegible]/19	[illegible]	Total: 14
[illegible]	Blood group detection Camp	[illegible]/[illegible]/19	Kolmavi Tippadige [illegible]	
[illegible]	do	[illegible]/[illegible]/19	do	
[illegible]	do	[illegible]/[illegible]/19	do	
[illegible]	Mega Health check up Camp & Anemia Detection & Dental Clinic	[illegible]/[illegible]/19	[illegible] School [illegible]	
[illegible]	Mega health ~~camp~~ up Camp	[illegible]/[illegible]/19	[illegible] Balagato	
[illegible]	Mega health checkup Awareness	[illegible]/[illegible]/19	[illegible] Nagthane	
[illegible]	Free health checkup camp	[illegible]/[illegible]/19	Mahavi Hindi High School	
[illegible]	Free health checkup camp	[illegible]/[illegible]/19	Balagato village	
	2020			Total: [illegible]
[illegible]	Free Health checkup camp	[illegible]/[illegible]/2020	[illegible] village	
	2021			
[illegible]	Mega free health checkup and medicine distribution camp	[illegible]/[illegible]/21	[illegible] Betada	Total: [illegible]
[illegible]	[illegible] Eng Medium Skills	[illegible]/[illegible]/21	[illegible] upper primary school Kuchera	
	2022			
[illegible]	[illegible] Cancer Screening and General Health checkup	[illegible]/[illegible]/22	Primary School Nagthane	Total: [illegible]
[illegible]	Weight loss checkup under [illegible] [illegible] Market [illegible]	[illegible]/[illegible]/22	[illegible] village	
[illegible]	Mega Health checkup Camp	[illegible]/[illegible]/22	[illegible] School Betada	Yekoru (23)
[illegible]	do	[illegible]/[illegible]/22	[illegible] village	
[illegible]	do	[illegible]/[illegible]/22	[illegible] village	
[illegible]	do	[illegible]/[illegible]/22	[illegible] village	

Water Quality Control Measures

i) Workshop Effluent

The waste-water from workshop and CHP, which normally remain laden with oil and grease, suspended and dissolved solids etc. is treated in the Effluent Treatment Plant (ETP). A 100 KL Effluent Treatment plant has been constructed at New Mairi UG to OC.

Water Quality Control Measures

ii) Mine Water

- The mine is conversion of underground coal mine to opencast coal mine. At present the water accumulates in the underground galleries. No mine discharge is being done from the opencast working area. However in future the pumps will be installed in the quarry for discharge of mine water.
- Most of the suspended particles will be settled in the sump located in the quarry and the supernatant water will be pumped out to the sedimentation tank present on surface. This water is to be passed through sedimentation pond on surface, before being reused or discharged in to River.
- A sedimentation tank has been constructed at New Majri UG to OC with dimension of 28 mtr x 8 mtr x 1.20 mtr (with 2 nos. baffle walls). For the expansion proposal an additional sedimentation tank has been proposed. Provision of Rs 25.00 Lakhs has been made in the approved Project Report for the construction of additional sedimentation tank.

Tel: (603)-363-4500 THOMAS INSTRUMENTS INC. Fax: (603)-363-4249

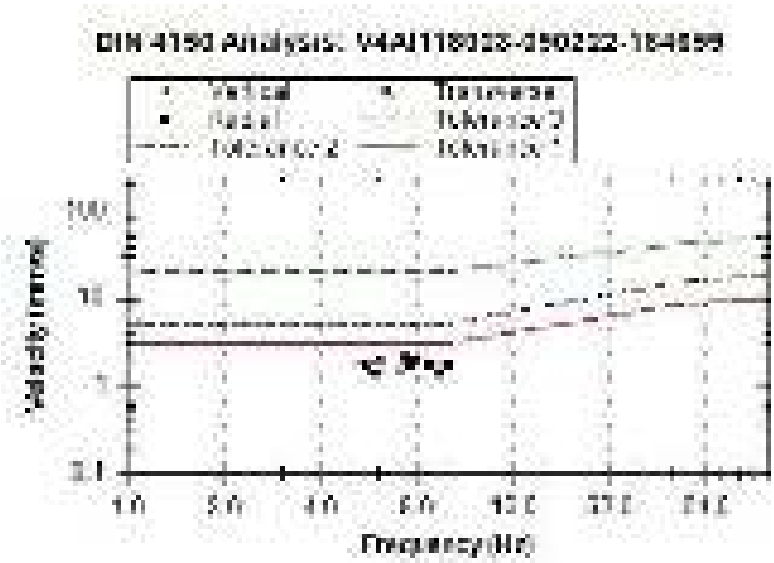
Vibration Report

EventName: V4AI118023-090222-164659
Recording Time: 16:46:59
Recording Date: 09-02-22

Project: NMUG to OC Mine, Majri Area,WCL
Location: OB HOE Face.
Operator: Blasting Officer, NMUG to OC Mine
Total Hole :- 55, Burden X Spacing :- 3.5m X 4.5m
Blast to Sensor Distance (m): 100m
Distance from Naglone Village :- 910m
Maximum Weight per Delay (Kg): 42.00 Kg
Hole Length :- 5.5m

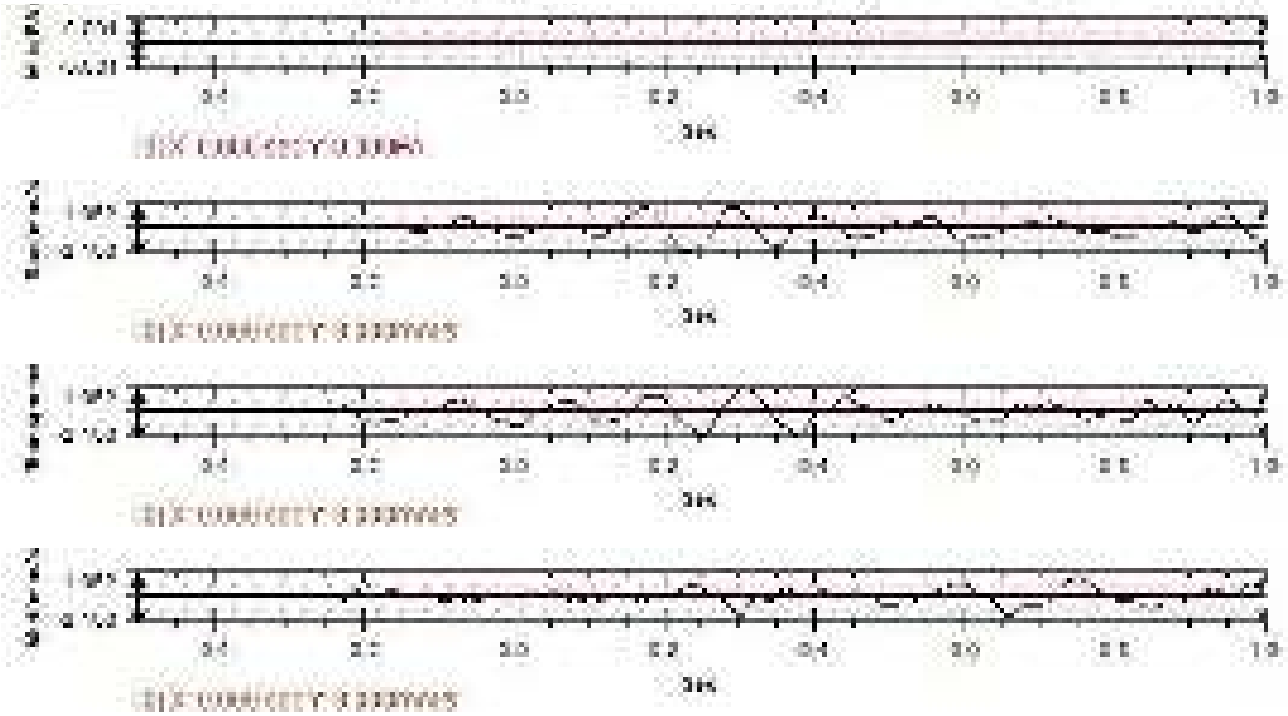
Peak Measurements

	Vertical	Transverse	Radial
PPV (mm/s)	1.691	2.096	2.103
Freq (Hz)	5.3	7.4	7.5
Time (ms)	660	250	230
PPA (g)	0.01	0.01	0.01
PPD (mm)	0.05078	0.04508	0.04463
PVS (mm/s)	2.943 @ 301.8ms		
PSPL (PA)	0.11 (74.942 dB) @ 296.9ms		
PSPL Freq	512.0Hz		
Sensor Test	Passed	Passed	Passed



System Configuration

Serial Number: V4AI118023
Calibration Date: December 21, 2021
Model: VMS-4000
Geo Trigger: 1.27 (mm/s)
Mic Trigger: Disabled
Manual Trigger: Disabled
Record Time: 1 seconds(s)
SeisWare Version Used For Download: 02.03.0000
Firmware Version: 1.00



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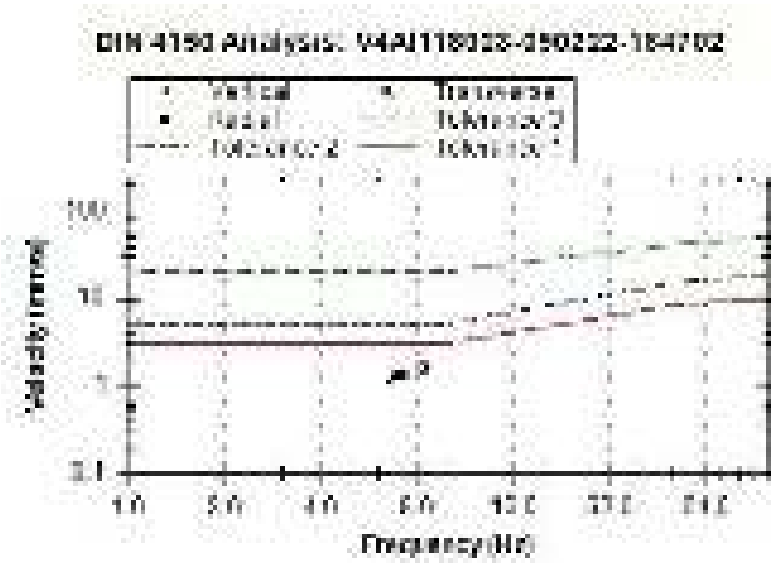
Vibration Report

EventName: V4AI118023-090222-164702
Recording Time: 16:47:02
Recording Date: 09-02-22

Project: NMUG to OC Mine, Majri Area, WCL
Location:Coal Face, Dept.
Operator: Blasting Officer, NMUG to OC Mine
Total Hole :- 18, Burden X Spacing :- 4.0m X 4.0m
Blast to Sensor Distance (m): 100m
Distance from Naglone village :- 920m
Maximum Weight per Delay (Kg): 31.25 Kg
Hole Length :- 5.0m

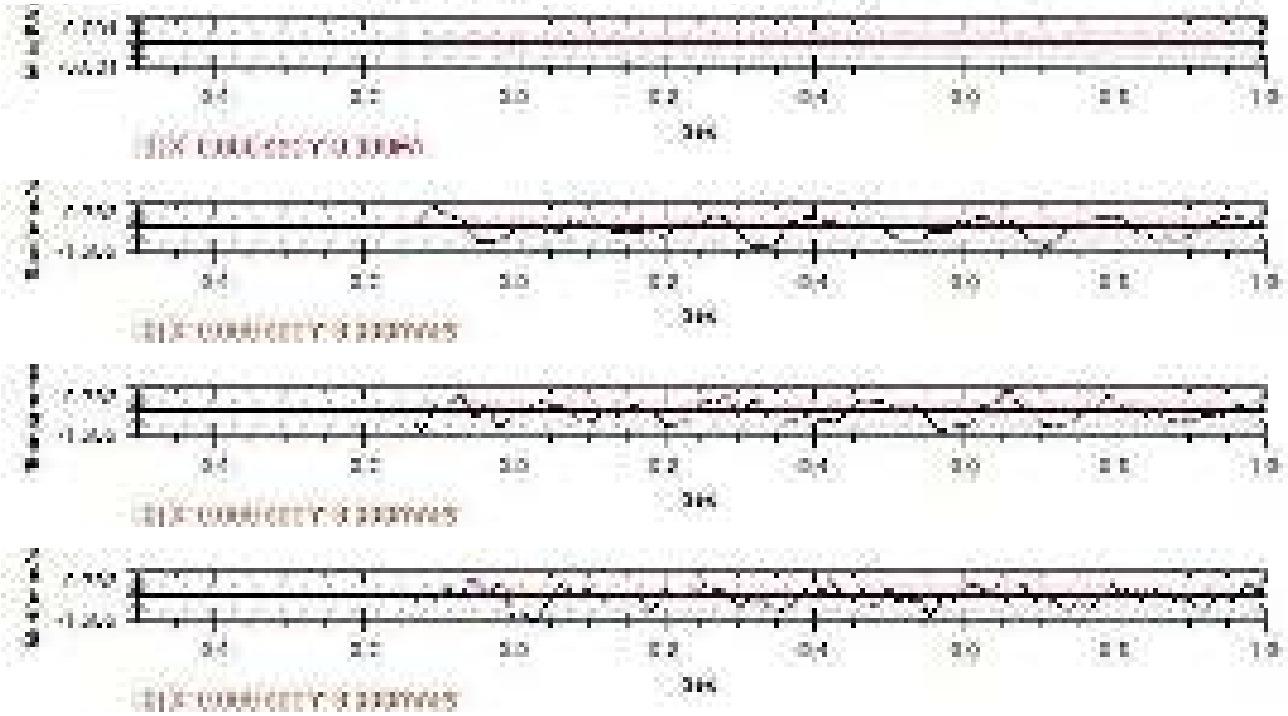
Peak Measurements

	Vertical	Transverse	Radial
PPV (mm/s)	1.565	1.293	1.300
Freq (Hz)	8.4	6.7	7.1
Time (ms)	26	657	322
PPA (g)	0.01	0.01	0.01
PPD (mm)	0.02965	0.03071	0.02914
PVS (mm/s)	1.632 @ 29.3ms		
PSPL (PA)	0.12 (75.412 dB) @ 506.8ms		
PSPL Freq	512.0Hz		
Sensor Test	Passed	Passed	Passed



System Configuration

Serial Number: V4AI118023
Calibration Date: December 21, 2021
Model: VMS-4000
Geo Trigger: 1.27 (mm/s)
Mic Trigger: Disabled
Manual Trigger: Disabled
Record Time: 1 seconds(s)
SeisWare Version Used For Download: 02.03.0000
Firmware Version: 1.00



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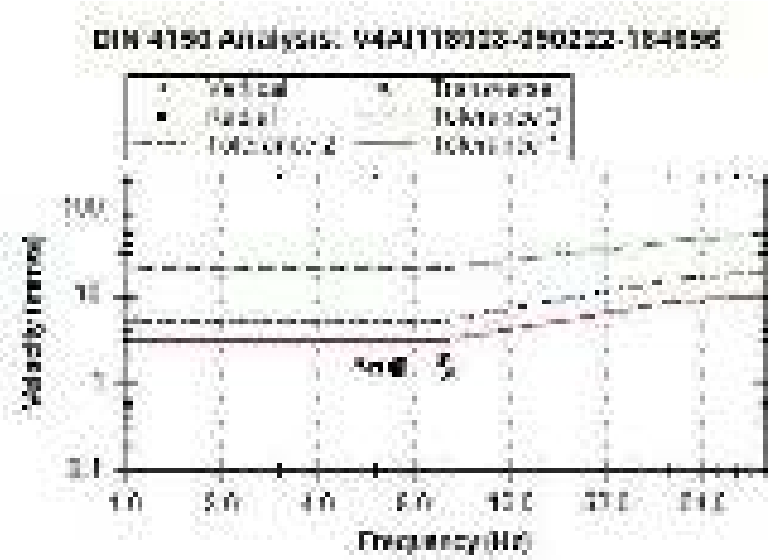
Vibration Report

EventName: V4AI118023-090222-164656
Recording Time: 16:46:56
Recording Date: 09-02-22

Project: NMUG to OC Mine,Majri Area,WCL
Location: OB HOE Face.
Operator: Blasting Officer, NMUG to OC Mine
Total Hole :- 55, Burden X Spacing :- 3.5 X 4.5
Blast to Sensor Distance (m): 100m
Distance from Patala Village :- 1430m
Maximum Weight per Delay (Kg): 42.00 Kg
Hole Length :- 5.5m

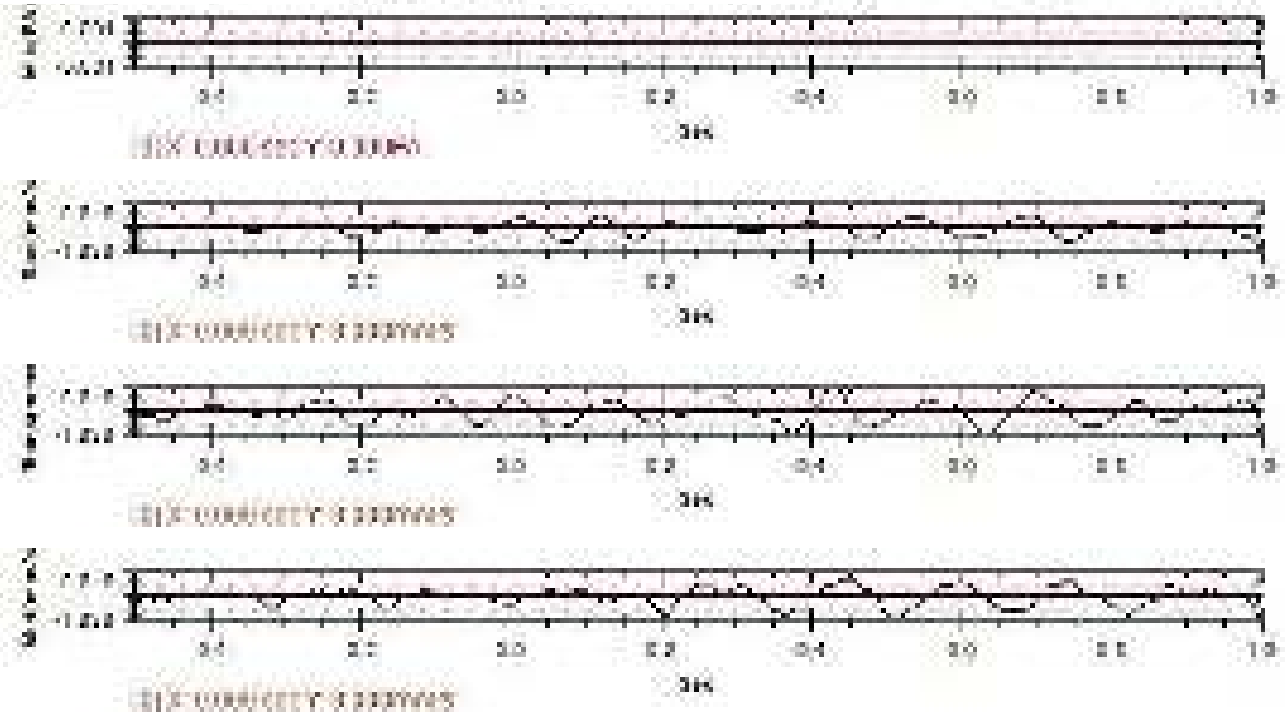
Peak Measurements

	Vertical	Transverse	Radial
PPV (mm/s)	1.670	1.838	1.188
Freq (Hz)	7.3	9.8	8.0
Time (ms)	510	430	72
PPA (g)	0.01	0.01	0.01
PPD (mm)	0.03641	0.02985	0.02363
PVS (mm/s)	2.106 @ 369.1ms		
PSPL (PA)	0.11 (74.942 dB) @ 67.4ms		
PSPL Freq	512.0Hz		
Sensor Test	Passed	Passed	Passed



System Configuration

Serial Number: V4AI118023
Calibration Date: December 21, 2021
Model: VMS-4000
Geo Trigger: 1.27 (mm/s)
Mic Trigger: Disabled
Manual Trigger: Disabled
Record Time: 1 seconds(s)
SeisWare Version Used For Download: 02.03.0000
Firmware Version: 1.00



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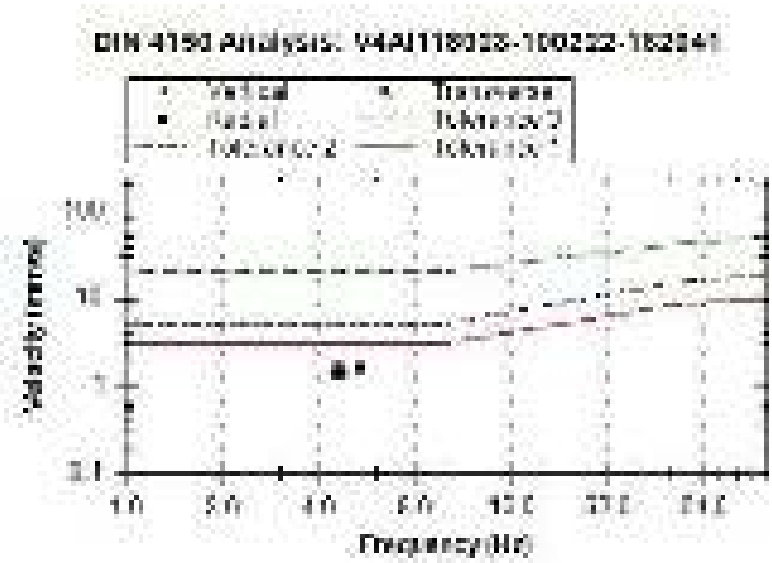
Vibration Report

EventName: V4AI118023-100222-162041
Recording Time: 16:20:41
Recording Date: 10-02-22

Project: NMUG to OC Mine,Majri Area,WCL
Location: OB HOE Face.
Operator: Blasting Officer, NMUG to OC Mine
Total Hole :- 50, Burden X Spacing :- 3.5m X 4.5m
Blast to Sensor Distance (m): 100m
Distance from Patala Village :- 1400m
Maximum Weight per Delay (Kg): 46.875 Kg
Hole Length :- 5.5m

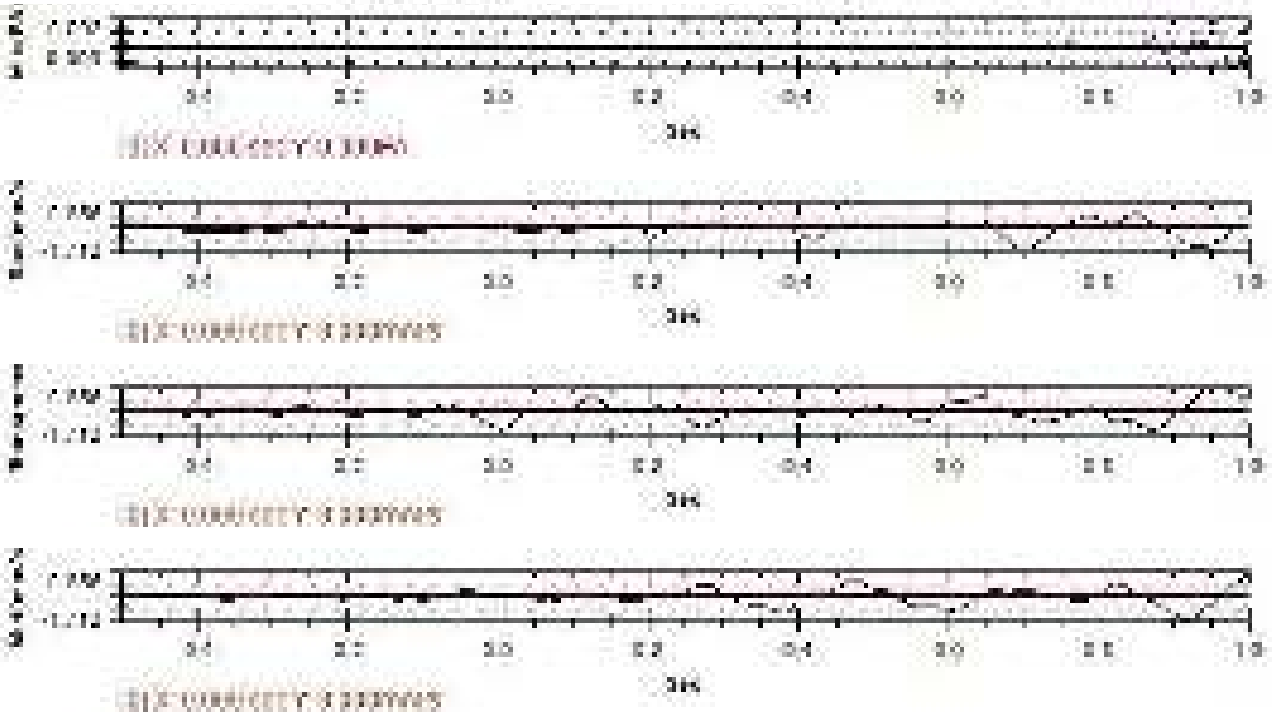
Peak Measurements

	Vertical	Transverse	Radial
PPV (mm/s)	1.614	1.712	1.558
Freq (Hz)	4.6	4.5	5.4
Time (ms)	917	953	700
PPA (g)	0.00	0.00	0.01
PPD (mm)	0.05584	0.06055	0.04592
PVS (mm/s)	2.242 @ 942.4ms		
PSPL (PA)	6.44 (110.161 dB) @ 956.1ms		
PSPL Freq	23.3Hz		
Sensor Test	Passed	Passed	Passed



System Configuration

Serial Number: V4AI118023
Calibration Date: December 21, 2021
Model: VMS-4000
Geo Trigger: 1.27 (mm/s)
Mic Trigger: Disabled
Manual Trigger: Disabled
Record Time: 1 seconds(s)
SeisWare Version Used For Download: 02.03.0000
Firmware Version: 1.00



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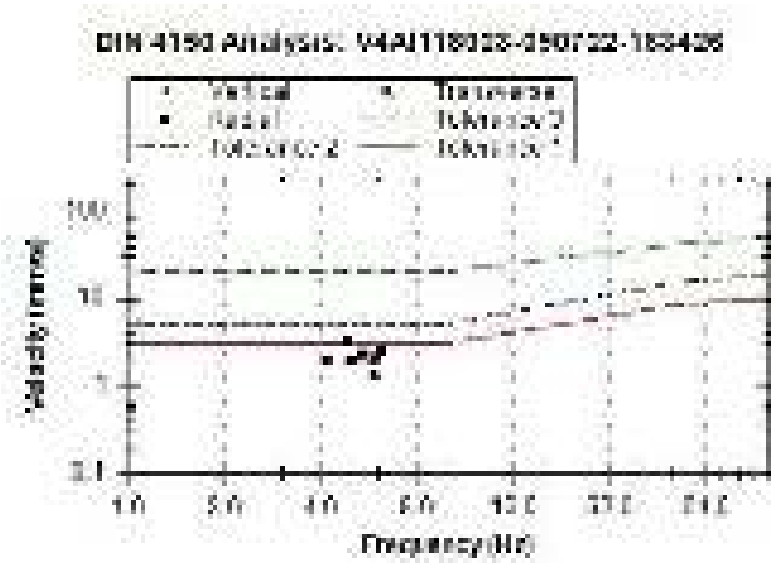
Vibration Report

EventName: V4AI118023-090722-163426
Recording Time: 16:34:26
Recording Date: 09-07-22

Project: NMUG to OC Mine,Majri Area,WCL
Location: OB HOE Face.
Operator: Blasting Officer, NMUG to OC Mine
Total Hole :- 39, Burden X Spacing :- 3.5m X 4.5m
Blast to Sensor Distance (m): 100m
Distance from Shivji Nagar :- 1100m
Maximum Weight per Delay (Kg): 48.00 Kg
Hole Length :- 5.5m

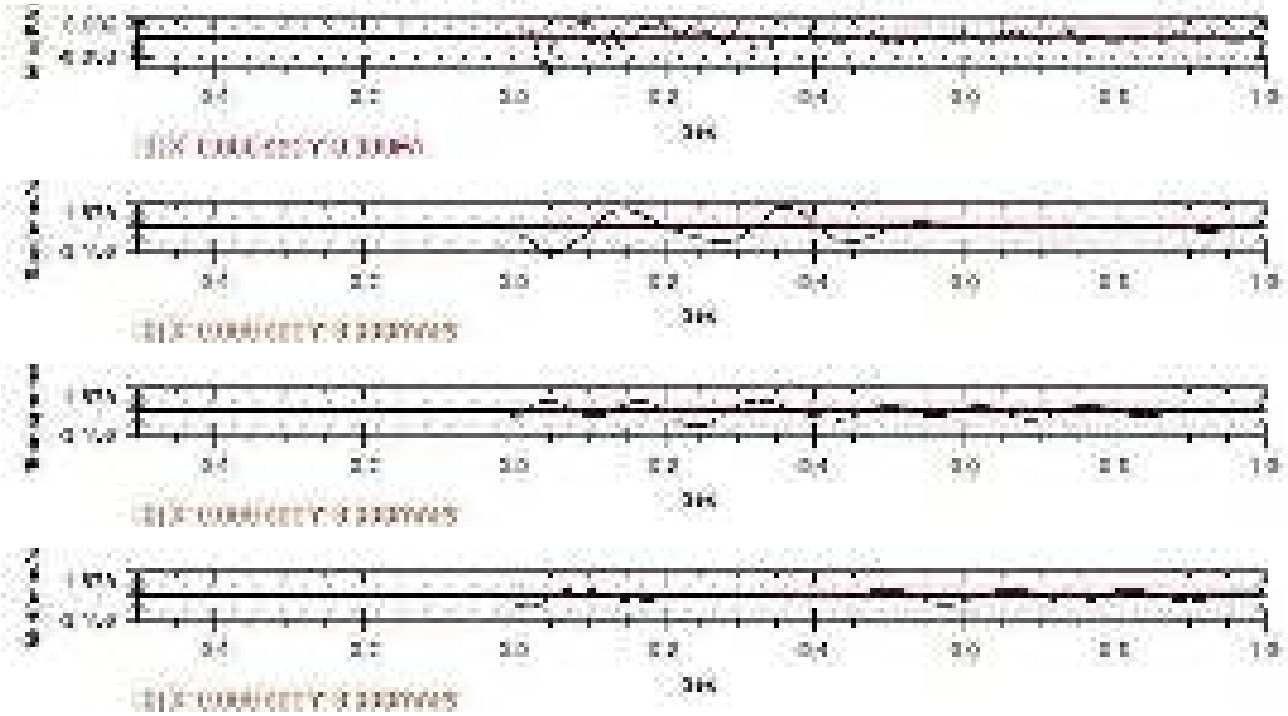
Peak Measurements

	Vertical	Transverse	Radial
PPV (mm/s)	1.384	2.103	3.159
Freq (Hz)	8.8	5.9	4.8
Time (ms)	18	244	52
PPA (g)	0.01	0.01	0.01
PPD (mm)	0.02503	0.05673	0.10474
PVS (mm/s)	3.411 @ 46.9ms		
PSPL (PA)	4.90 (107.778 dB) @ 39.1ms		
PSPL Freq	12.8Hz		
Sensor Test	Passed	Passed	Passed



System Configuration

Serial Number: V4AI118023
Calibration Date: December 21, 2021
Model: VMS-4000
Geo Trigger: 1.27 (mm/s)
Mic Trigger: Disabled
Manual Trigger: Disabled
Record Time: 1 seconds(s)
SeisWare Version Used For Download: 02.03.0000
Firmware Version: 1.00



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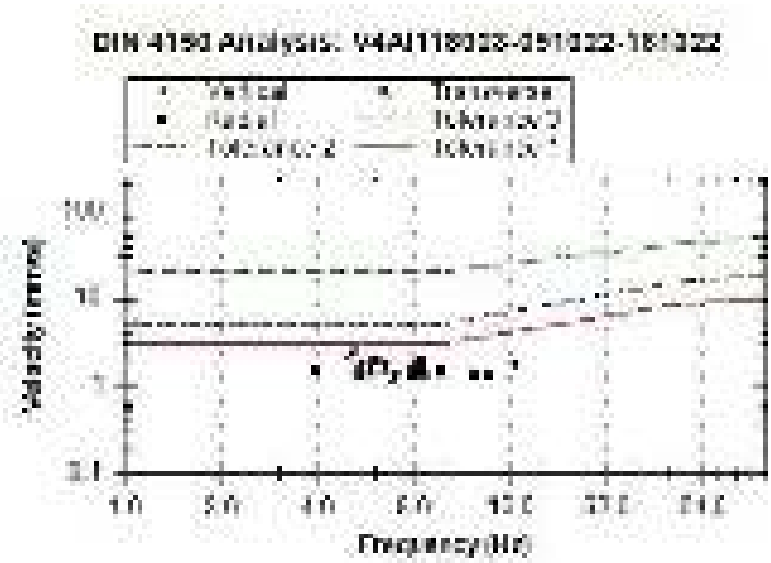
Vibration Report

EventName: V4AI118023-091022-161322
Recording Time: 16:13:22
Recording Date: 09-10-22

Project: NMUG to OC Mine,Majri Area,WCL
Location: OB HOE Face.
Operator: Blasting Officer, NMUG to OC Mine
Total Hole :- 67, Burden X Spacing :- 3.5m X 4.5m
Blast to Sensor Distance (m): 100m
Distance from Patala Village :- 1400m
Maximum Weight per Delay (Kg): 45.00 Kg
Hole Length :- 5.5m

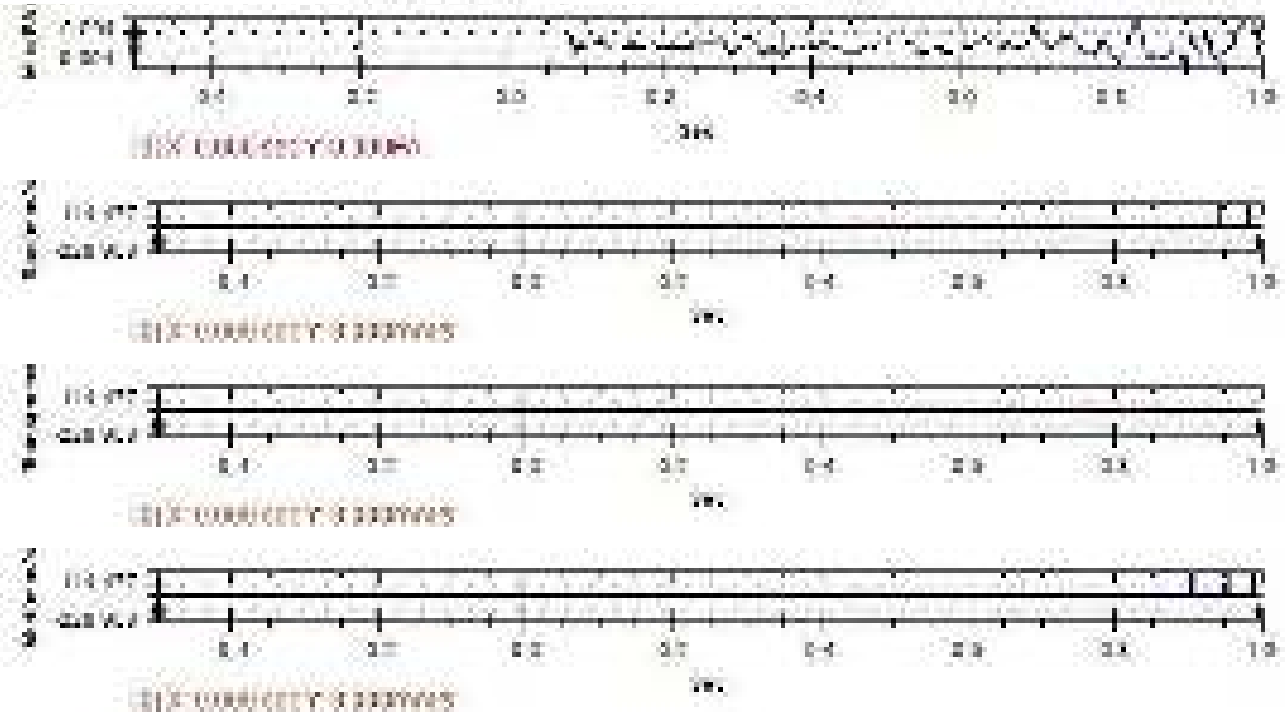
Peak Measurements

	Vertical	Transverse	Radial
PPV (mm/s)	1.335	2.390	1.964
Freq (Hz)	5.3	5.2	8.4
Time (ms)	457	361	743
PPA (g)	0.00	0.01	0.01
PPD (mm)	0.04009	0.07315	0.03721
PVS (mm/s)	2.505 @ 358.4ms		
PSPL (PA)	7.02 (110.914 dB) @ 977.5ms		
PSPL Freq	21.3Hz		
Sensor Test	Passed	Passed	Passed



System Configuration

Serial Number: V4AI118023
Calibration Date: December 21, 2021
Model: VMS-4000
Geo Trigger: 1.27 (mm/s)
Mic Trigger: Disabled
Manual Trigger: Disabled
Record Time: 1 seconds(s)
SeisWare Version Used For Download: 02.03.0000
Firmware Version: 1.00



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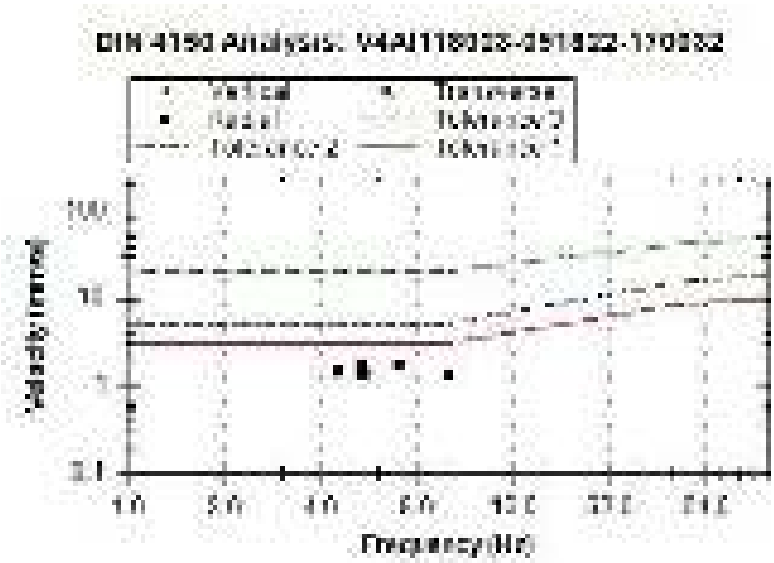
Vibration Report

EventName: V4AI118023-091822-170032
Recording Time: 17:00:32
Recording Date: 09-18-22

Project: NMUG to OC Mine,Majri Area,WCL
Location: Coal Face, Dept.
Operator: Blasting Officer, NMUG to OC Mine
Total Hole :- 24, Burden X Spacing :- 3.5m X 4.5m
Blast to Sensor Distance (m): 100m
Distance from Patala village :- 1420m
Maximum Weight per Delay (Kg): 46.875 Kg
Hole Length :- 5.0m

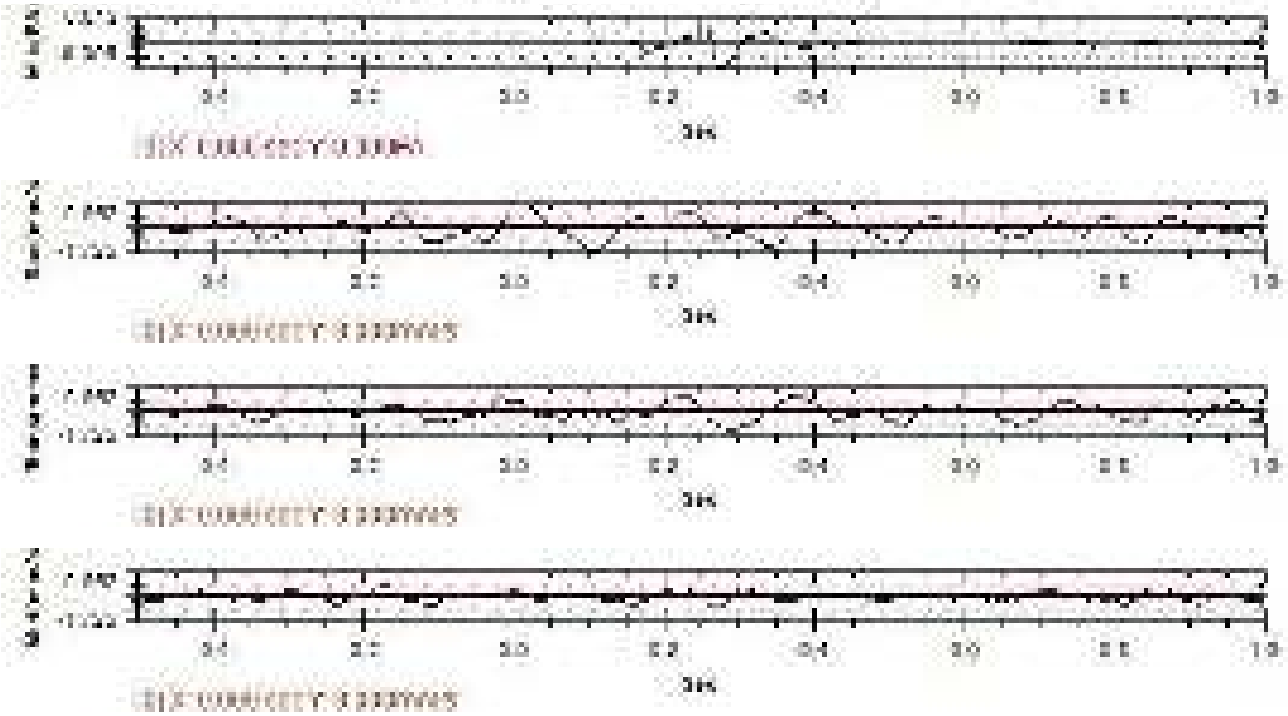
Peak Measurements

	Vertical	Transverse	Radial
PPV (mm/s)	0.783	1.335	1.726
Freq (Hz)	10.0	5.6	5.4
Time (ms)	270	291	107
PPA (g)	0.01	0.00	0.01
PPD (mm)	0.01246	0.03794	0.05087
PVS (mm/s)	1.802 @ 107.4ms		
PSPL (PA)	12.70 (116.059 dB) @ 253.9ms		
PSPL Freq	9.8Hz		
Sensor Test	Passed	Passed	Passed



System Configuration

Serial Number: V4AI118023
Calibration Date: December 21, 2021
Model: VMS-4000
Geo Trigger: 1.27 (mm/s)
Mic Trigger: Disabled
Manual Trigger: Disabled
Record Time: 1 seconds(s)
SeisWare Version Used For Download: 02.03.0000
Firmware Version: 1.00



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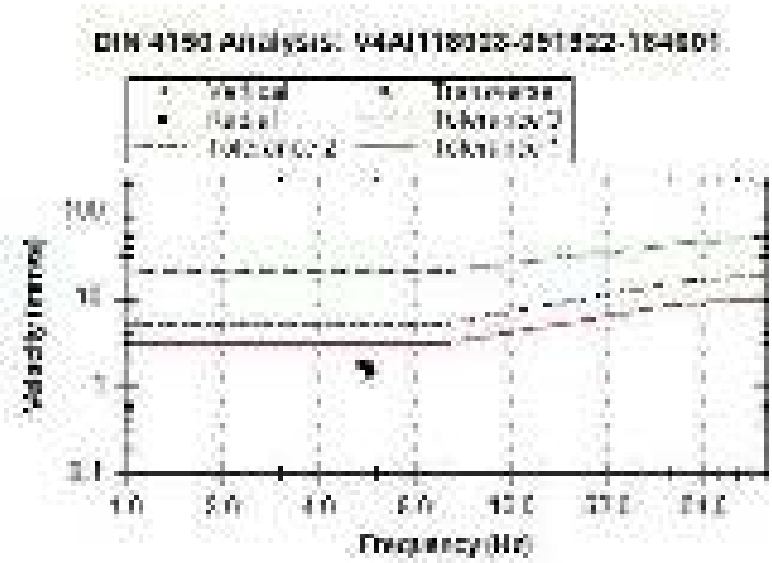
Vibration Report

EventName: V4AI118023-091922-164601
Recording Time: 16:46:01
Recording Date: 09-19-22

Project: NMUG to OC Mine, Majri Area,WCL
Location: OB HOE Face.
Operator: Blasting Officer, NMUG to OC Mine
Total Hole :- 43, Burden X Spacing :- 3.5m X 4.5m
Blast to Sensor Distance (m): 100m
Distance from Patala Village :- 1450m
Maximum Weight per Delay (Kg): 46.875 Kg
Hole Length :- 5.5m

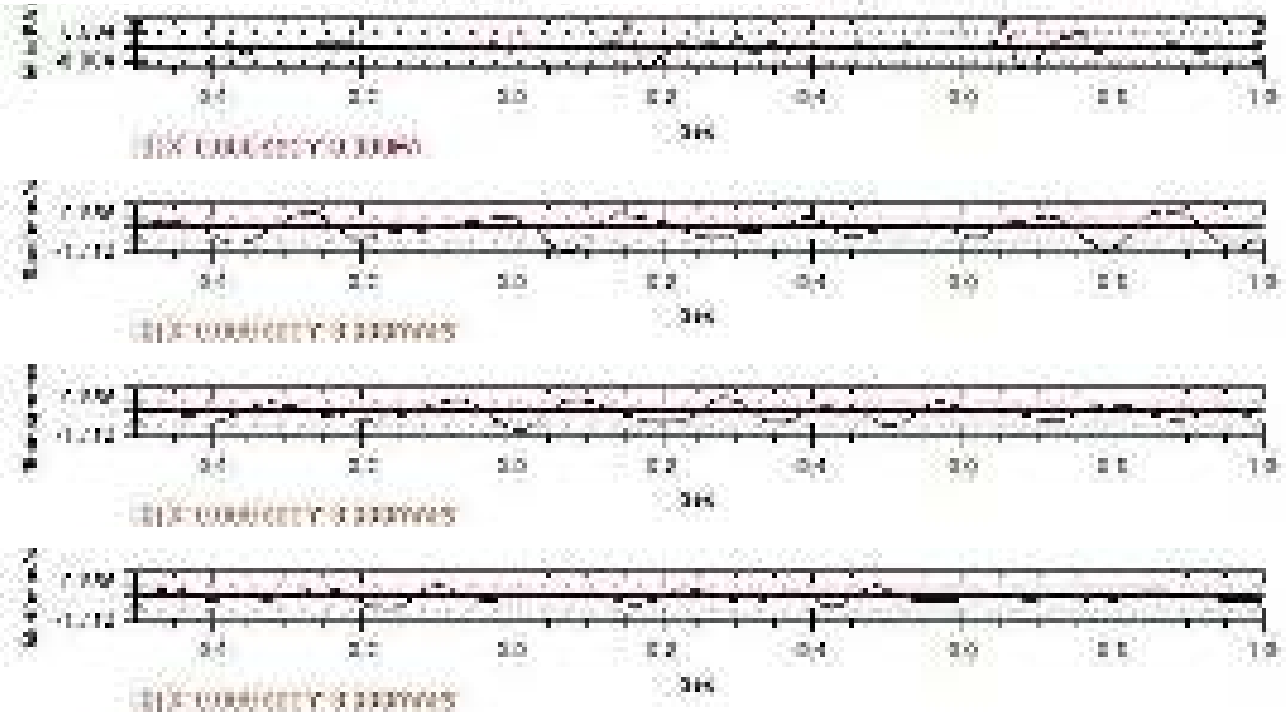
Peak Measurements

	Vertical	Transverse	Radial
PPV (mm/s)	0.755	1.377	1.712
Freq (Hz)	7.5	5.8	5.4
Time (ms)	423	10	74
PPA (g)	0.00	0.01	0.01
PPD (mm)	0.01602	0.03779	0.05046
PVS (mm/s)	1.895 @ 77.1ms		
PSPL (PA)	8.83 (112.901 dB) @ 653.3ms		
PSPL Freq	14.6Hz		
Sensor Test	Passed	Passed	Passed



System Configuration

Serial Number: V4AI118023
Calibration Date: December 21, 2021
Model: VMS-4000
Geo Trigger: 1.27 (mm/s)
Mic Trigger: Disabled
Manual Trigger: Disabled
Record Time: 1 seconds(s)
SeisWare Version Used For Download: 02.03.0000
Firmware Version: 1.00



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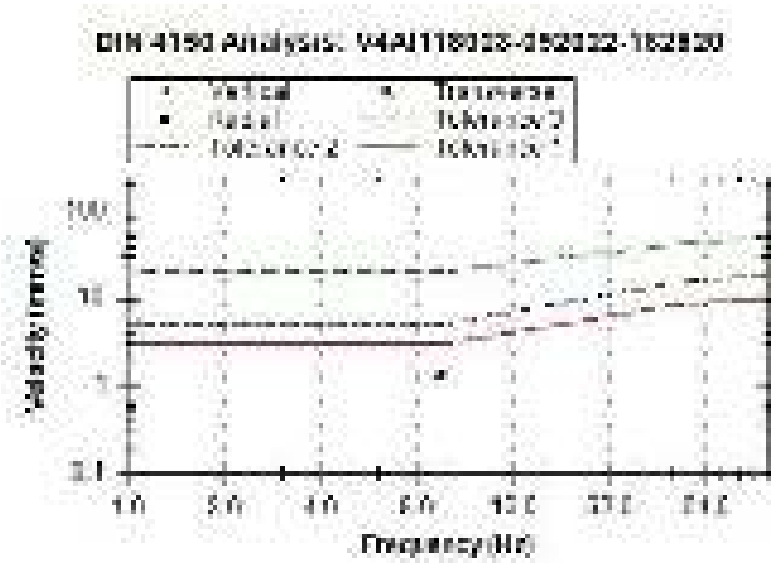
Vibration Report

EventName: V4AI118023-092022-162820
Recording Time: 16:28:20
Recording Date: 09-20-22

Project: NMUG to OC Mine,Majri Area, WCL
Location: OB HOE Face.
Operator: Blasting Officer, NMUG to OC Mine
Total Hole :- 50, Burden X Spacing :- 3.5m X 4.5m
Blast to Sensor Distance (m): 100m
Distance from Naglone Village :- 910m
Maximum Weight per Delay (Kg): 46.875 Kg
Hole Length :- 5.5m

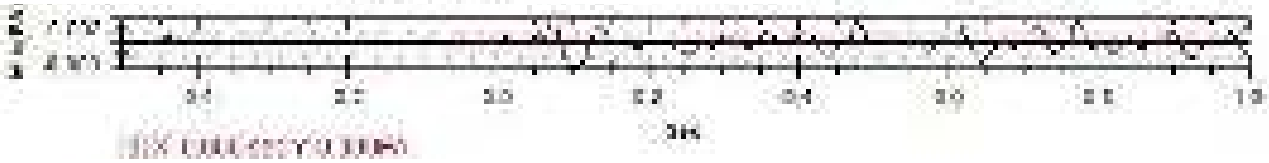
Peak Measurements

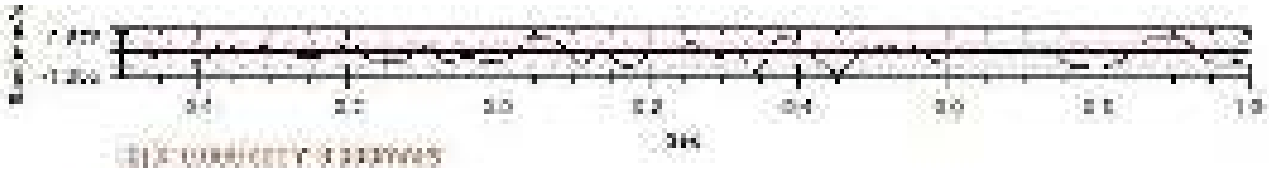
	Vertical	Transverse	Radial
PPV (mm/s)	1.230	1.356	1.195
Freq (Hz)	5.2	9.5	6.5
Time (ms)	175	4	452
PPA (g)	0.00	0.01	0.00
PPD (mm)	0.03765	0.02272	0.02926
PVS (mm/s)	1.807 @ 2.9ms		
PSPL (PA)	3.15 (103.954 dB) @ 101.6ms		
PSPL Freq	12.5Hz		
Sensor Test	Passed	Passed	Passed

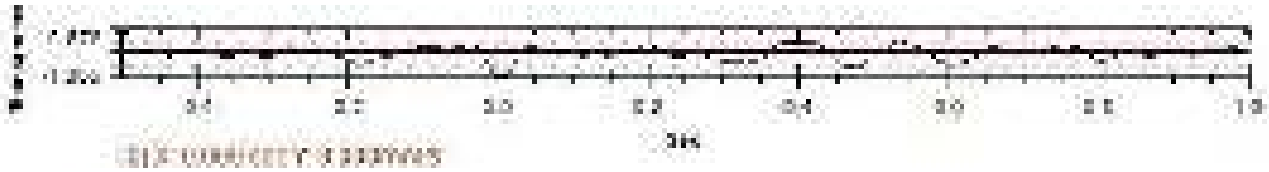


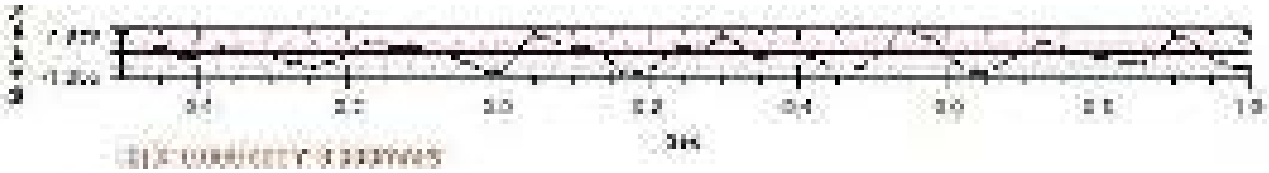
System Configuration

Serial Number: V4AI118023
Calibration Date: December 21, 2021
Model: VMS-4000
Geo Trigger: 1.27 (mm/s)
Mic Trigger: Disabled
Manual Trigger: Disabled
Record Time: 1 seconds(s)
SeisWare Version Used For Download: 02.03.0000
Firmware Version: 1.00









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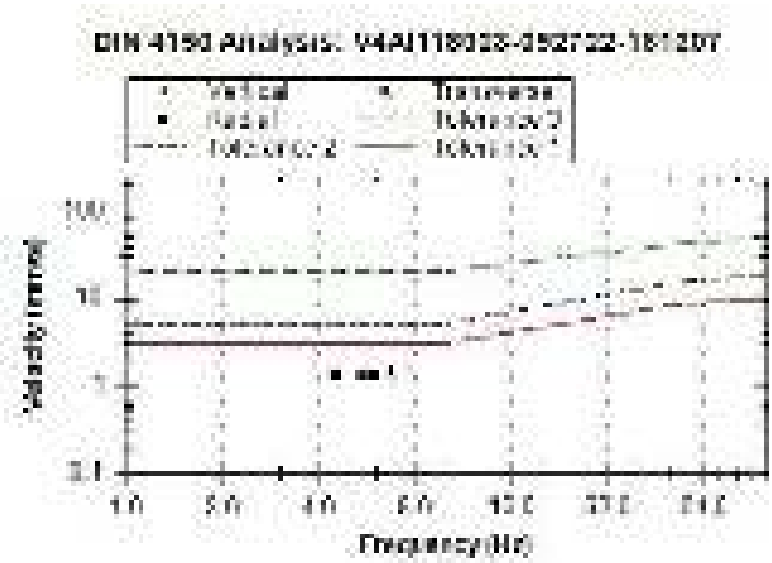
Vibration Report

EventName: V4AI118023-092722-161207
Recording Time: 16:12:07
Recording Date: 09-27-22

Project: NMUG to OC Mine,Majri Area,WCL
Location: OB HOE Face.
Operator: Blasting Officer, NMUG to OC Mine
Total Hole :- 60, Burden X Spacing :- 3.5 mX 4.5m
Blast to Sensor Distance (m): 100m
Distance from Naglone Village :- 920m
Maximum Weight per Delay (Kg): 50.00 Kg
Hole Length :- 5.5m

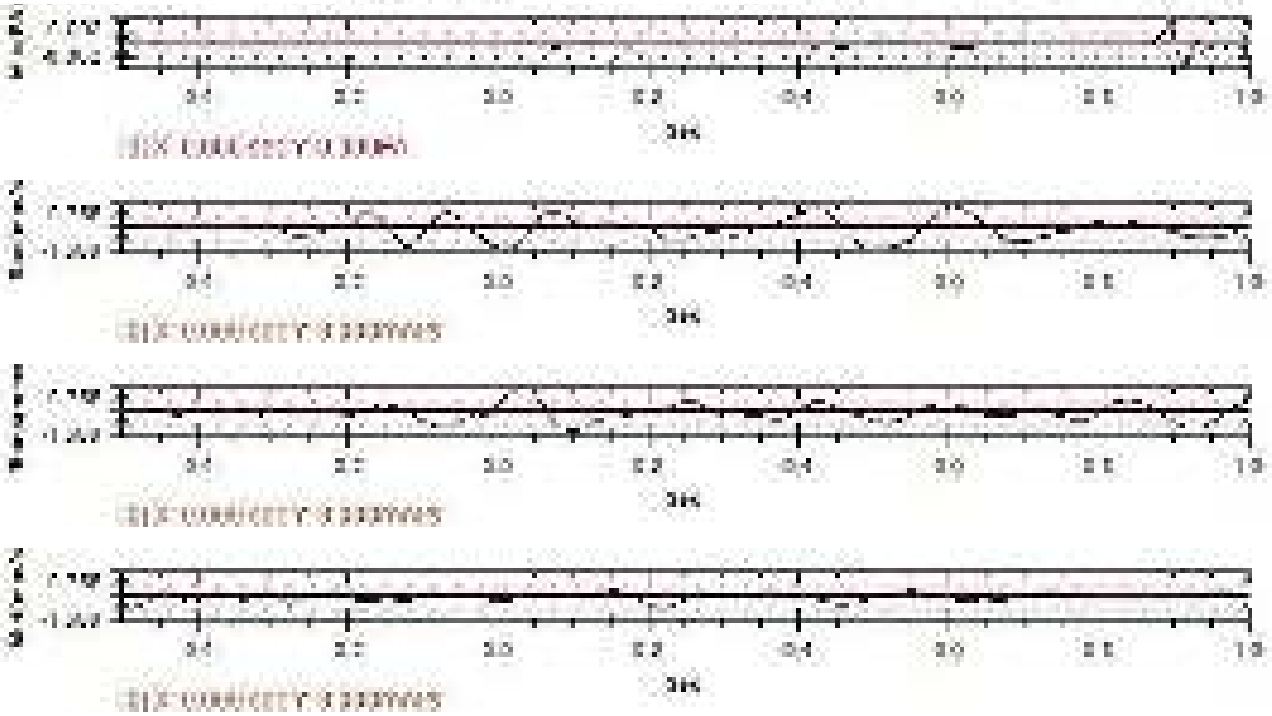
Peak Measurements

	Vertical	Transverse	Radial
PPV (mm/s)	0.783	1.509	1.349
Freq (Hz)	6.0	6.6	4.5
Time (ms)	217	34	498
PPA (g)	0.00	0.01	0.00
PPD (mm)	0.02077	0.03639	0.04771
PVS (mm/s)	1.814 @ 26.4ms		
PSPL (PA)	3.74 (105.429 dB) @ 894.5ms		
PSPL Freq	12.5Hz		
Sensor Test	Passed	Passed	Passed



System Configuration

Serial Number: V4AI118023
Calibration Date: December 21, 2021
Model: VMS-4000
Geo Trigger: 1.27 (mm/s)
Mic Trigger: Disabled
Manual Trigger: Disabled
Record Time: 1 seconds(s)
SeisWare Version Used For Download: 02.03.0000
Firmware Version: 1.00



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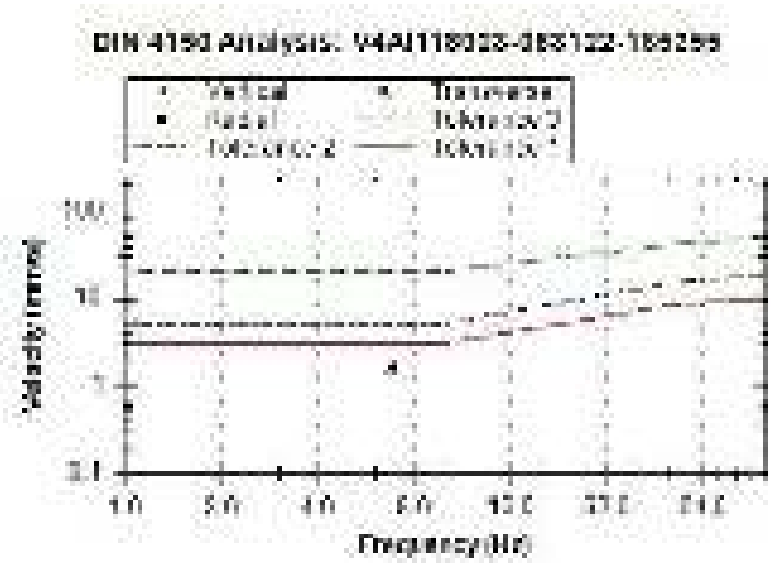
Vibration Report

EventName: V4AI118023-083122-165255
Recording Time: 16:52:55
Recording Date: 08-31-22

Project: NMUG to OC Mine, Majri Area, WCL
Location: OB HOE Face,
Operator: Blasting Officer, NMUG to OC Mine
Total Hole :- 50, Burden X Spacing :- 3.5m X 4.5m
Blast to Sensor Distance (m): 100m
Distance from Patala Village :- 1450m
Maximum Weight per Delay (Kg): 46.875 Kg
Hole Length :- 5.5m

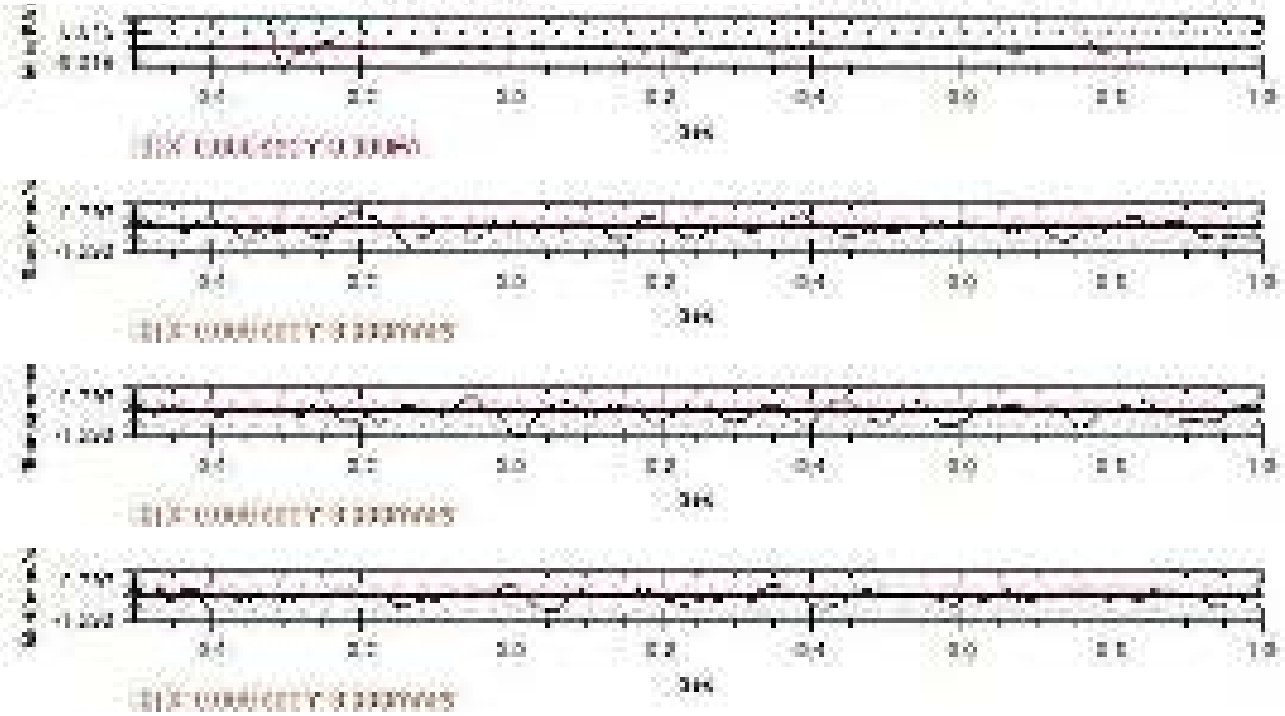
Peak Measurements

	Vertical	Transverse	Radial
PPV (mm/s)	1.027	1.593	0.999
Freq (Hz)	7.2	6.8	5.6
Time (ms)	56	15	737
PPA (g)	0.00	0.01	0.00
PPD (mm)	0.02270	0.03728	0.02839
PVS (mm/s)	1.596 @ 16.6ms		
PSPL (PA)	6.30 (109.966 dB) @ 769.5ms		
PSPL Freq	24.4Hz		
Sensor Test	Passed	Passed	Passed



System Configuration

Serial Number: V4AI118023
Calibration Date: December 21, 2021
Model: VMS-4000
Geo Trigger: 1.27 (mm/s)
Mic Trigger: Disabled
Manual Trigger: Disabled
Record Time: 1 seconds(s)
SeisWare Version Used For Download: 02.03.0000
Firmware Version: 1.00



P.O. BOX 50 ROUTE 9 SPOFFORD, NH 03462

Tel: (603)-363-4500 THOMAS INSTRUMENTS INC. Fax: (603)-363-4249

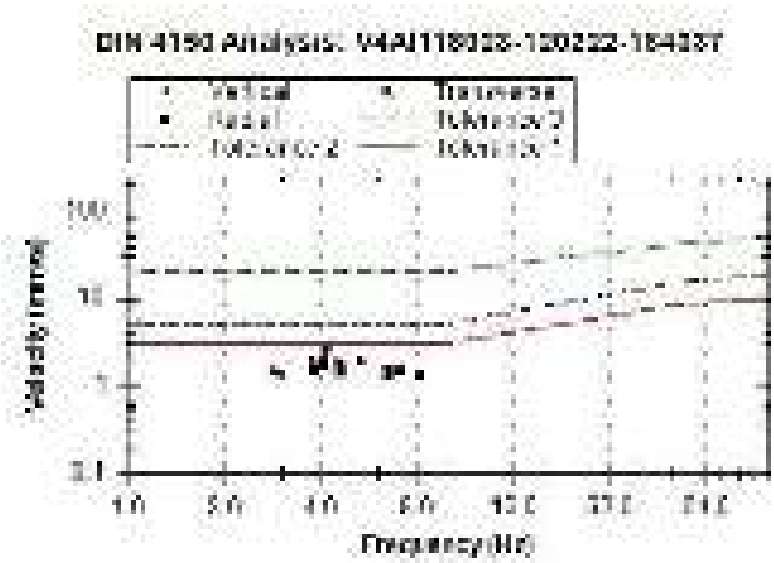
Vibration Report

EventName: V4AI118023-120222-164337
Recording Time: 16:43:37
Recording Date: 12-02-22

Project: NMUG to OC Mine,Majri Area,WCL
Location: OB HOE Face.
Operator: Blasting Officer, NMUG to OC Mine
Total Hole :- 60, Burden X Spacing :- 3.5m X 4.5m
Blast to Sensor Distance (m): 100m
Distance from Patala village :- 1400m
Maximum Weight per Delay (Kg): 50.00 Kg
Hole Length :- 5.5m

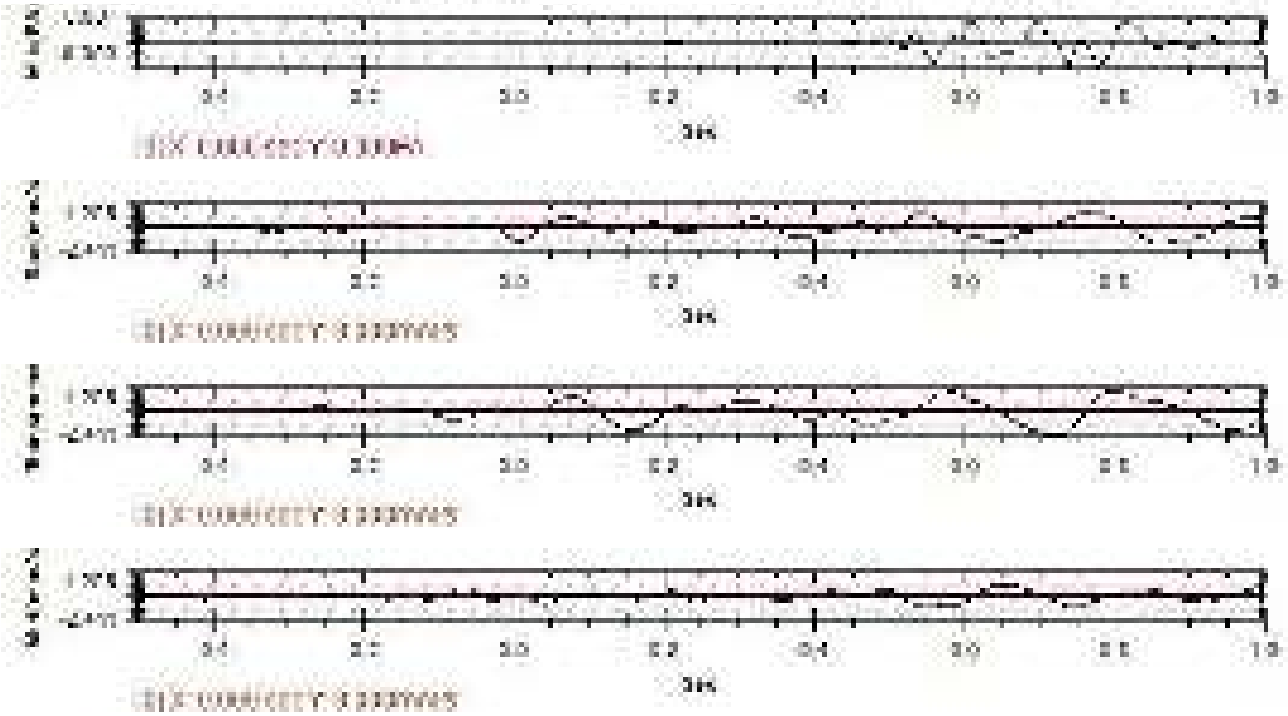
Peak Measurements

	Vertical	Transverse	Radial
PPV (mm/s)	1.160	2.411	1.726
Freq (Hz)	5.2	4.2	4.1
Time (ms)	747	724	863
PPA (g)	0.00	0.01	0.00
PPD (mm)	0.03550	0.09136	0.06700
PVS (mm/s)	2.587 @ 731.4ms		
PSPL (PA)	6.65 (110.433 dB) @ 699.2ms		
PSPL Freq	14.6Hz		
Sensor Test	Passed	Passed	Passed



System Configuration

Serial Number: V4AI118023
Calibration Date: December 21, 2021
Model: VMS-4000
Geo Trigger: 1.27 (mm/s)
Mic Trigger: Disabled
Manual Trigger: Disabled
Record Time: 1 seconds(s)
SeisWare Version Used For Download: 02.03.0000
Firmware Version: 1.00



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Tel: (603)-363-4500 THOMAS INSTRUMENTS INC. Fax: (603)-363-4249

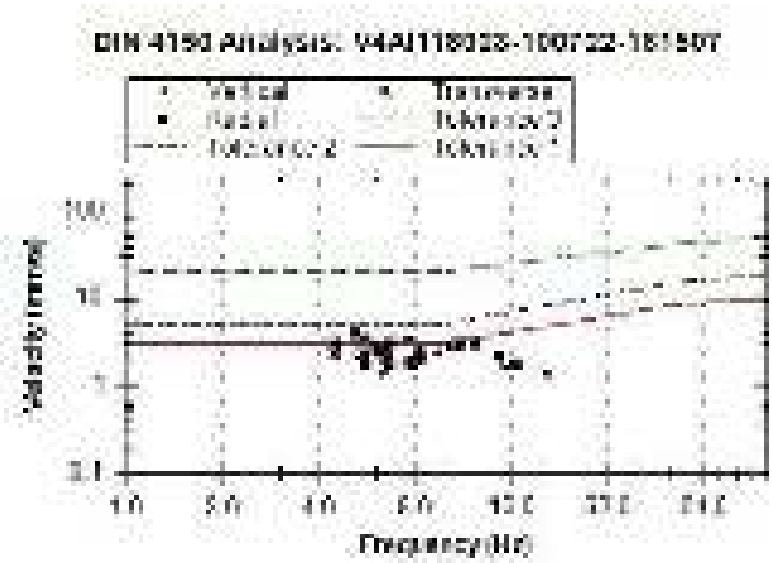
Vibration Report

EventName: V4AI118023-100722-161507
Recording Time: 16:15:07
Recording Date: 10-07-22

Project: NMUG to OC Mine,Majri Area,WCL
Location: OB HOE Face.
Operator: Blasting Officer, NMUG to OC Mine
Total Hole :- 49, Burden X Spacing :- 3.5m X 4.5m
Blast to Sensor Distance (m): 100m
Distance from Naglone village :- 900m
Maximum Weight per Delay (Kg): 50.00 Kg
Hole Length :- 5.5m

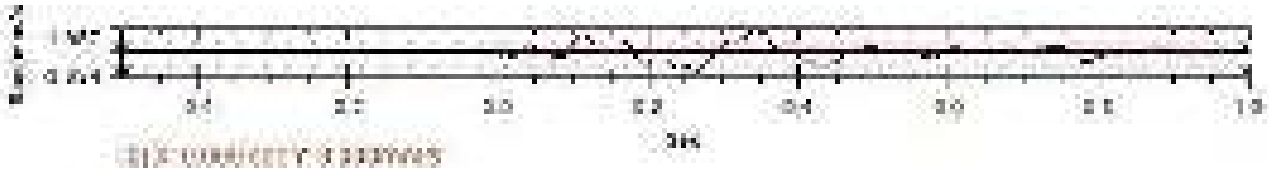
Peak Measurements

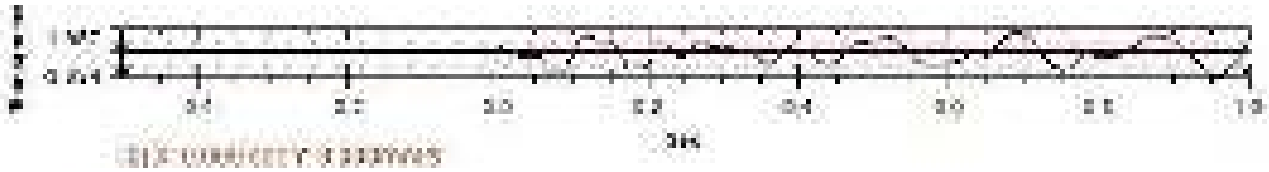
	Vertical	Transverse	Radial
PPV (mm/s)	3.704	3.934	3.829
Freq (Hz)	23.3	5.5	5.2
Time (ms)	3	956	344
PPA (g)	0.06	0.01	0.01
PPD (mm)	0.02530	0.11384	0.11719
PVS (mm/s)	4.084 @ 344.7ms		
PSPL (PA)	8.61 (112.678 dB) @ 168.9ms		
PSPL Freq	6.7Hz		
Sensor Test	Passed	Passed	Passed

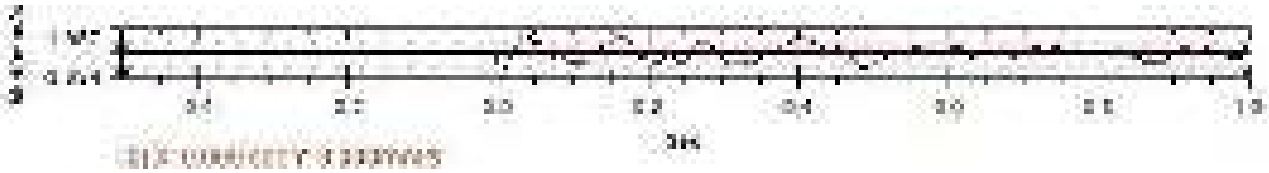


System Configuration

Serial Number: V4AI118023
Calibration Date: December 21, 2021
Model: VMS-4000
Geo Trigger: 1.27 (mm/s)
Mic Trigger: Disabled
Manual Trigger: Disabled
Record Time: 1 seconds(s)
SeisWare Version Used For Download: 02.03.0000
Firmware Version: 1.00







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Tel: (603)-363-4500 THOMAS INSTRUMENTS INC. Fax: (603)-363-4249

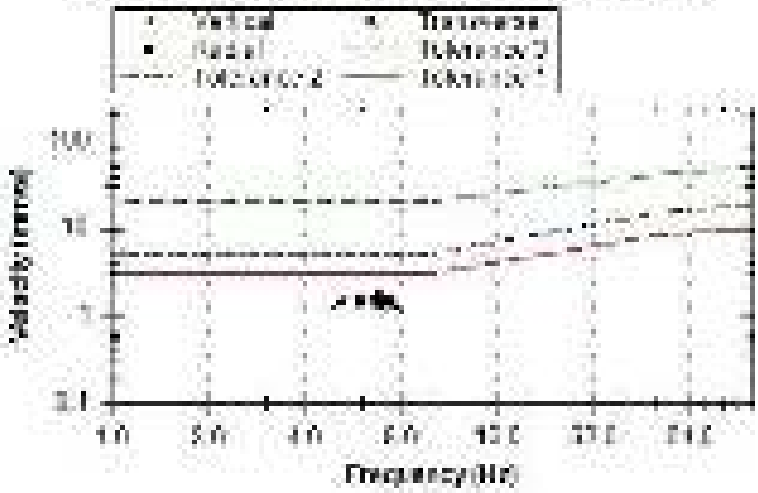
Vibration Report

EventName: V4AI118023-111322-164208
Recording Time: 16:42:08
Recording Date: 11-13-22

Project: NMUG to OC Mine,Majri Area,WCL
Location: OB HOE Face.
Operator: Blasting Officer, NMUG to OC Mine
Total Hole :- 54, Burden X Spacing :- 3.5m X 4.5m
Blast to Sensor Distance (m): 100m
Distance from Patala village :- 1400m
Maximum Weight per Delay (Kg): 47.00 Kg
Hole Length :- 5.5m

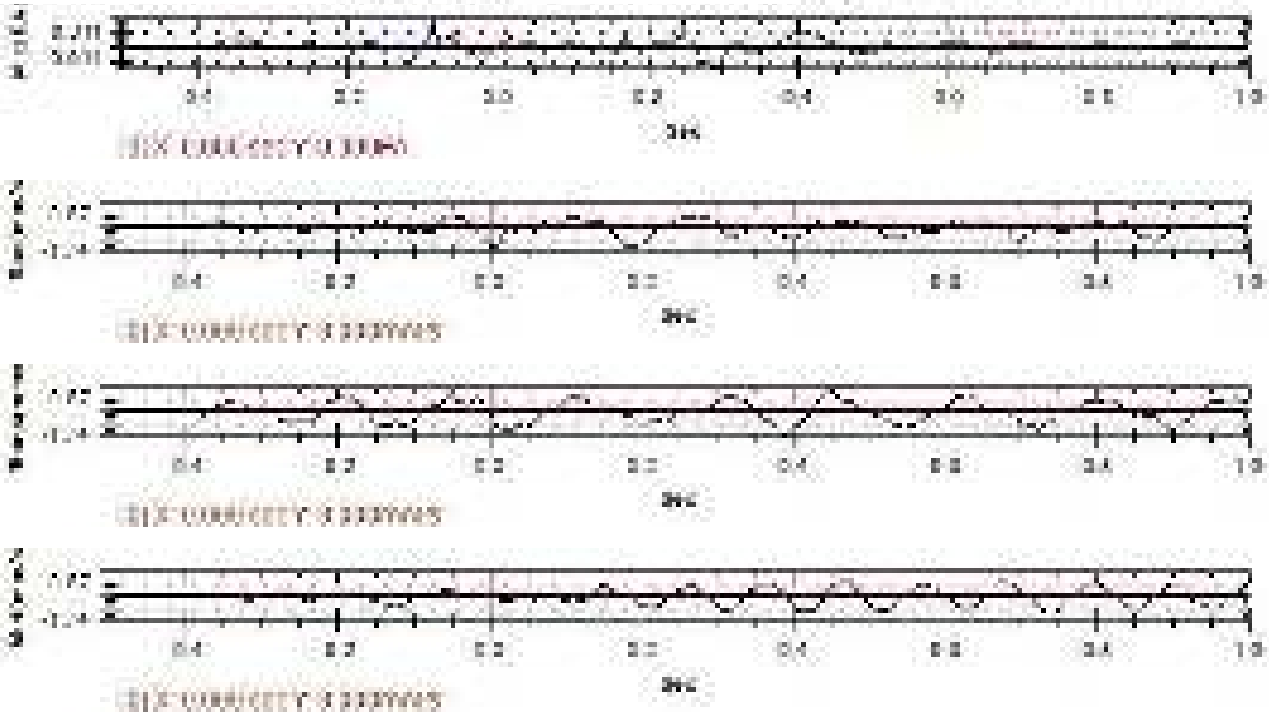
Peak Measurements

	Vertical	Transverse	Radial
PPV (mm/s)	1.216	1.740	1.440
Freq (Hz)	7.8	6.8	7.4
Time (ms)	734	387	185
PPA (g)	0.01	0.01	0.01
PPD (mm)	0.02481	0.04072	0.03097
PVS (mm/s)	1.898 @ 400.4ms		
PSPL (PA)	22.61 (121.066 dB) @ 245.1ms		
PSPL Freq	9.8Hz		
Sensor Test	Passed	Passed	Passed



System Configuration

Serial Number: V4AI118023
Calibration Date: December 21, 2021
Model: VMS-4000
Geo Trigger: 1.27 (mm/s)
Mic Trigger: Disabled
Manual Trigger: Disabled
Record Time: 1 seconds(s)
SeisWare Version Used For Download: 02.03.0000
Firmware Version: 1.00



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Tel: (603)-363-4500 THOMAS INSTRUMENTS INC. Fax: (603)-363-4249

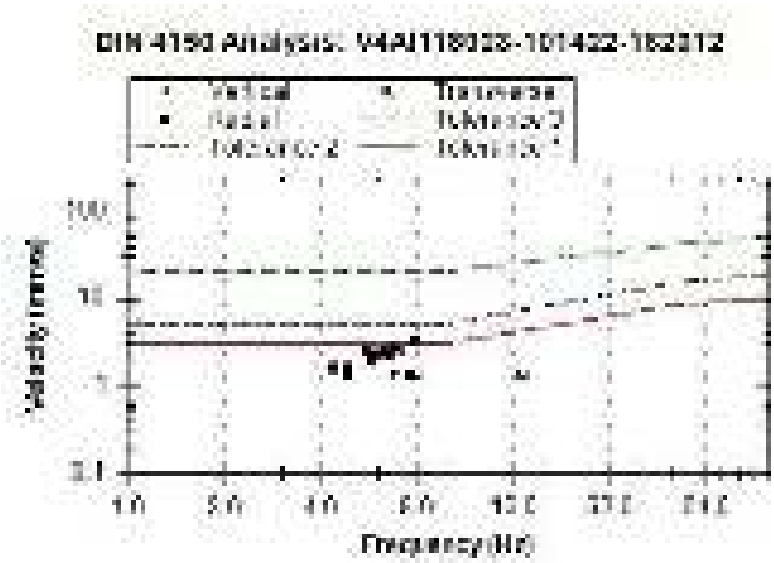
Vibration Report

EventName: V4AI118023-101422-162312
Recording Time: 16:23:12
Recording Date: 10-14-22

Project: NMUG to OC Mine, Majri Area
Location: OB HOE Face.
Operator: Blasting Officer, NMUG to OC Mine
Total Hole :- 48, Burden X Spacing :- 3.5m X 4.5m
Blast to Sensor Distance (m): 100m
Distance from Shivji Nagar village :- 1100m
Maximum Weight per Delay (Kg): 46.00 Kg
Hole Length :- 5.5m

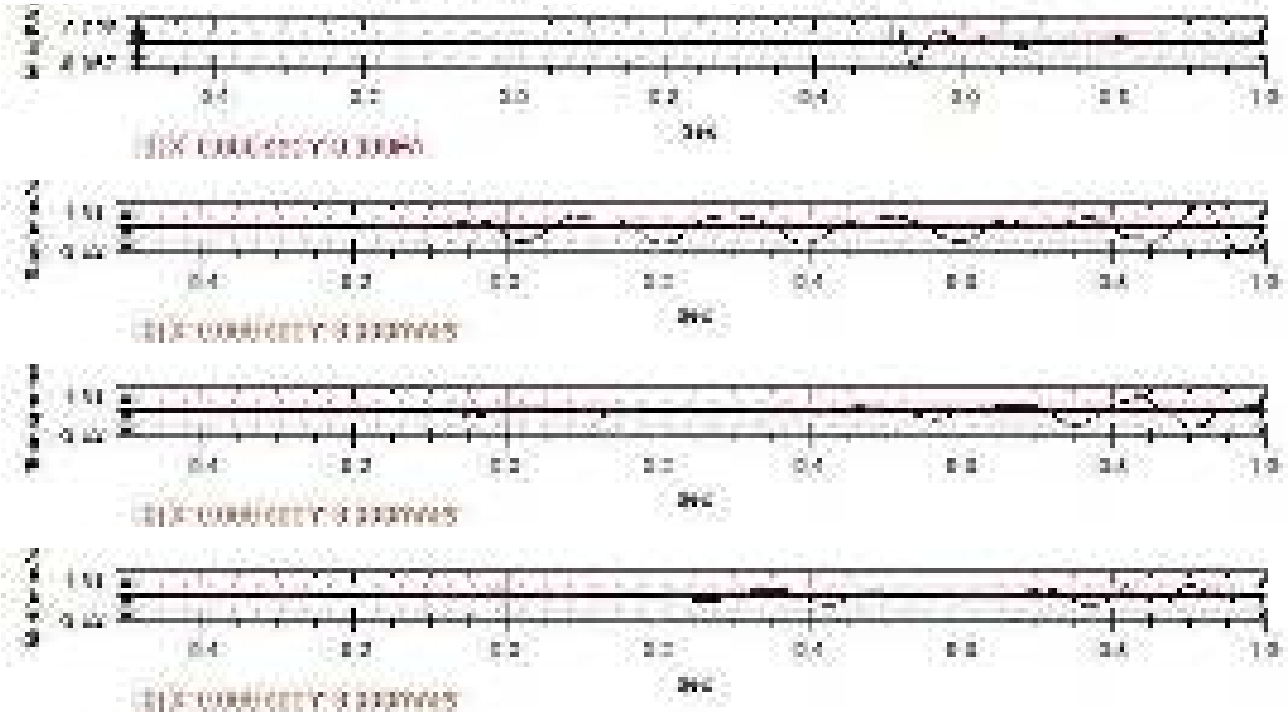
Peak Measurements

	Vertical	Transverse	Radial
PPV (mm/s)	1.384	2.634	3.620
Freq (Hz)	7.5	6.8	7.9
Time (ms)	767	905	971
PPA (g)	0.01	0.01	0.02
PPD (mm)	0.02937	0.06165	0.07293
PVS (mm/s)	4.176 @ 912.1ms		
PSPL (PA)	58.08 (129.261 dB) @ 533.2ms		
PSPL Freq	14.6Hz		
Sensor Test	Passed	Passed	Passed



System Configuration

Serial Number: V4AI118023
Calibration Date: December 21, 2021
Model: VMS-4000
Geo Trigger: 1.27 (mm/s)
Mic Trigger: Disabled
Manual Trigger: Disabled
Record Time: 1 seconds(s)
SeisWare Version Used For Download: 02.03.0000
Firmware Version: 1.00



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Tel: (603)-363-4500 THOMAS INSTRUMENTS INC. Fax: (603)-363-4249

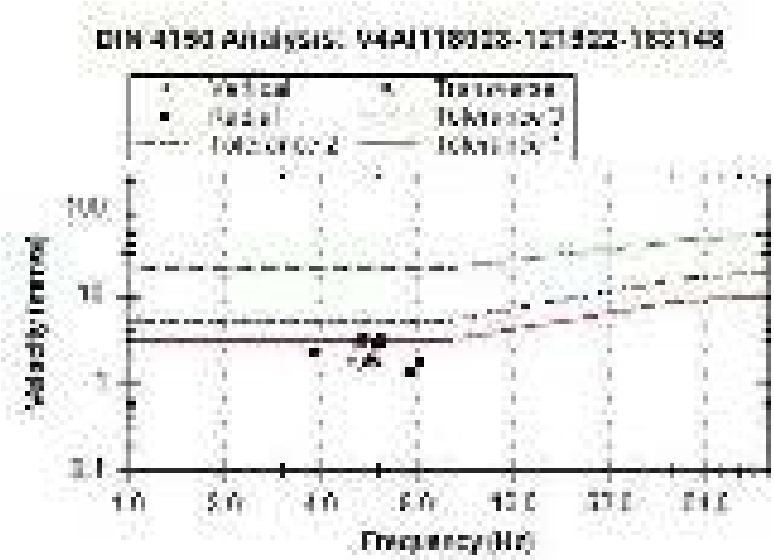
Vibration Report

EventName: V4AI118023-121922-163148
Recording Time: 16:31:48
Recording Date: 12-19-22

Project: NMUG to OC Mine,Majri Area,WCL
Location: OB HOE Face.
Operator: Blasting Officer, NMUG to OC Mine
Total Hole :- 62, Burden X Spacing :- 3.5m X 4.5m
Blast to Sensor Distance (m): 100m
Distance from Naglone village :- 900m
Maximum Weight per Delay (Kg): 46.00Kg
Hole Length :- 5.5m

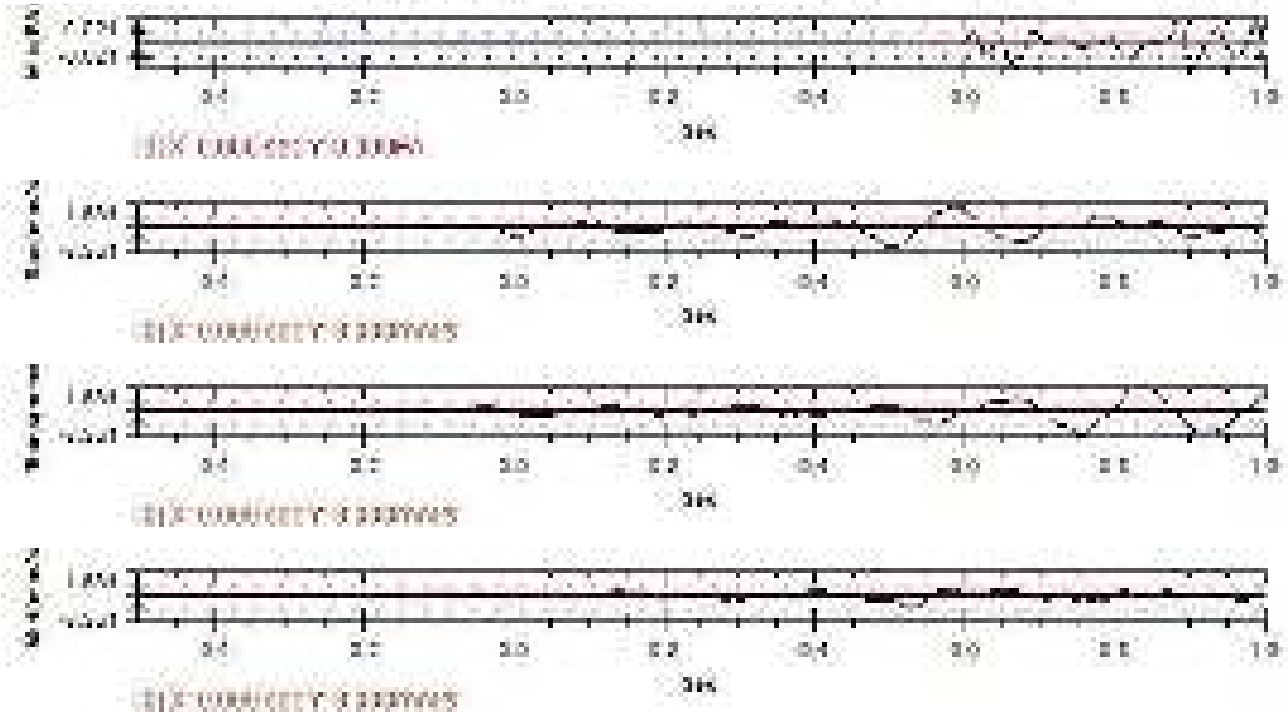
Peak Measurements

	Vertical	Transverse	Radial
PPV (mm/s)	1.712	3.361	2.851
Freq (Hz)	5.0	6.2	6.2
Time (ms)	524	841	589
PPA (g)	0.01	0.01	0.01
PPD (mm)	0.05449	0.08628	0.07319
PVS (mm/s)	3.383 @ 754.9ms		
PSPL (PA)	41.24 (126.288 dB) @ 883.8ms		
PSPL Freq	9.3Hz		
Sensor Test	Passed	Passed	Passed



System Configuration

Serial Number: V4AI118023
Calibration Date: December 21, 2021
Model: VMS-4000
Geo Trigger: 1.27 (mm/s)
Mic Trigger: Disabled
Manual Trigger: Disabled
Record Time: 1 seconds(s)
SeisWare Version Used For Download: 02.03.0000
Firmware Version: 1.00



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Tel: (603)-363-4500 THOMAS INSTRUMENTS INC. Fax: (603)-363-4249

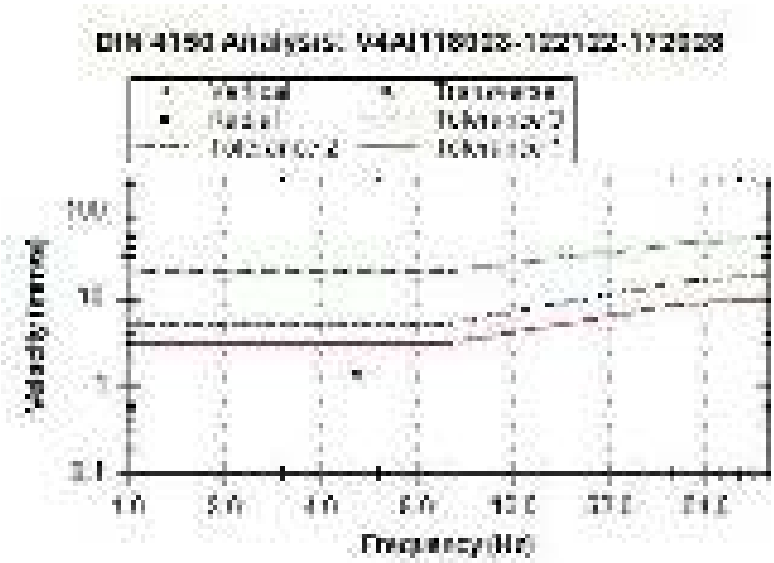
Vibration Report

EventName: V4AI118023-122122-172028
Recording Time: 17:20:28
Recording Date: 12-21-22

Project: NMUG to OC Mine,Majri Area,WCL
Location: OB HOE Face
Operator: Blasting Officer, NMUG to OC Mine
Total Hole :- 55, Burden X Spacing :- 3.5m X 4.5m
Blast to Sensor Distance (m): 100m
Distance from Naglone village :- 900m
Maximum Weight per Delay (Kg): 45.00 Kg
Hole Length :- 5.5m

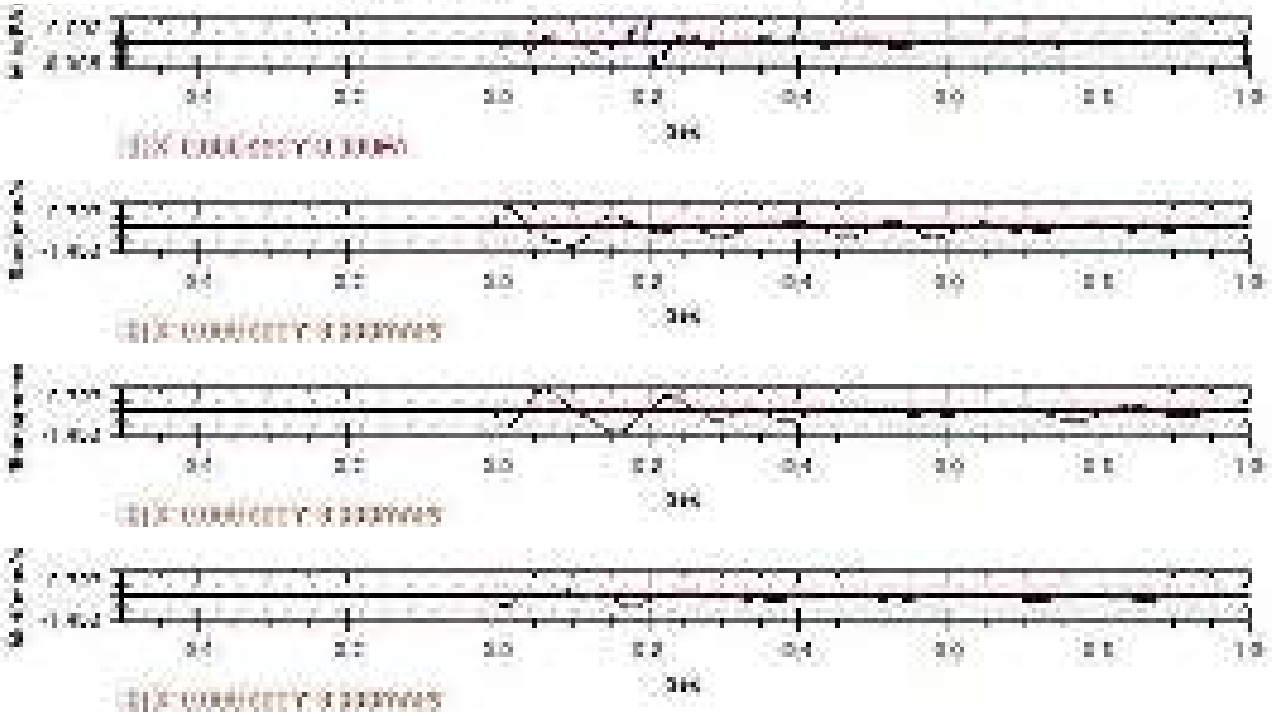
Peak Measurements

	Vertical	Transverse	Radial
PPV (mm/s)	0.671	1.328	1.453
Freq (Hz)	4.7	5.2	12.5
Time (ms)	173	158	0
PPA (g)	0.00	0.00	0.01
PPD (mm)	0.02272	0.04065	0.01850
PVS (mm/s)	1.739 @ 0.0ms		
PSPL (PA)	4.76 (107.533 dB) @ 217.8ms		
PSPL Freq	18.3Hz		
Sensor Test	Passed	Passed	Passed



System Configuration

Serial Number: V4AI118023
Calibration Date: December 21, 2021
Model: VMS-4000
Geo Trigger: 1.27 (mm/s)
Mic Trigger: Disabled
Manual Trigger: Disabled
Record Time: 1 seconds(s)
SeisWare Version Used For Download: 02.03.0000
Firmware Version: 1.00



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Tel: (603)-363-4500 THOMAS INSTRUMENTS INC. Fax: (603)-363-4249

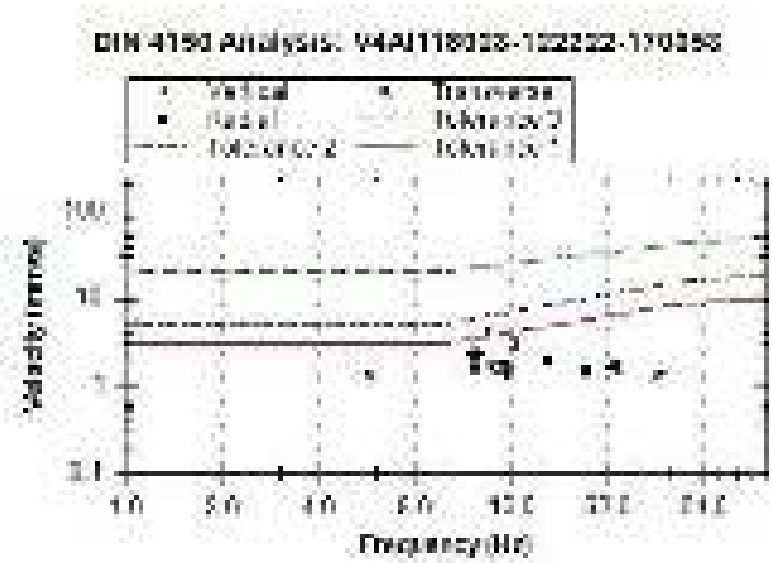
Vibration Report

EventName: V4AI118023-122222-170353
Recording Time: 17:03:53
Recording Date: 12-22-22

Project: NMUG to OC Mine,Majri Area,WCL
Location: OB HOE Face.
Operator: Blasting Officer, NMUG to OC Mine
Total Hole :- 60, Burden X Spacing :- 3.5m X 4.5m
Blast to Sensor Distance (m): 100m
Distance from Shivji Nagar Village :- 1100m
Maximum Weight per Delay (Kg): 50.00 Kg
Hole Length :- 5.5m

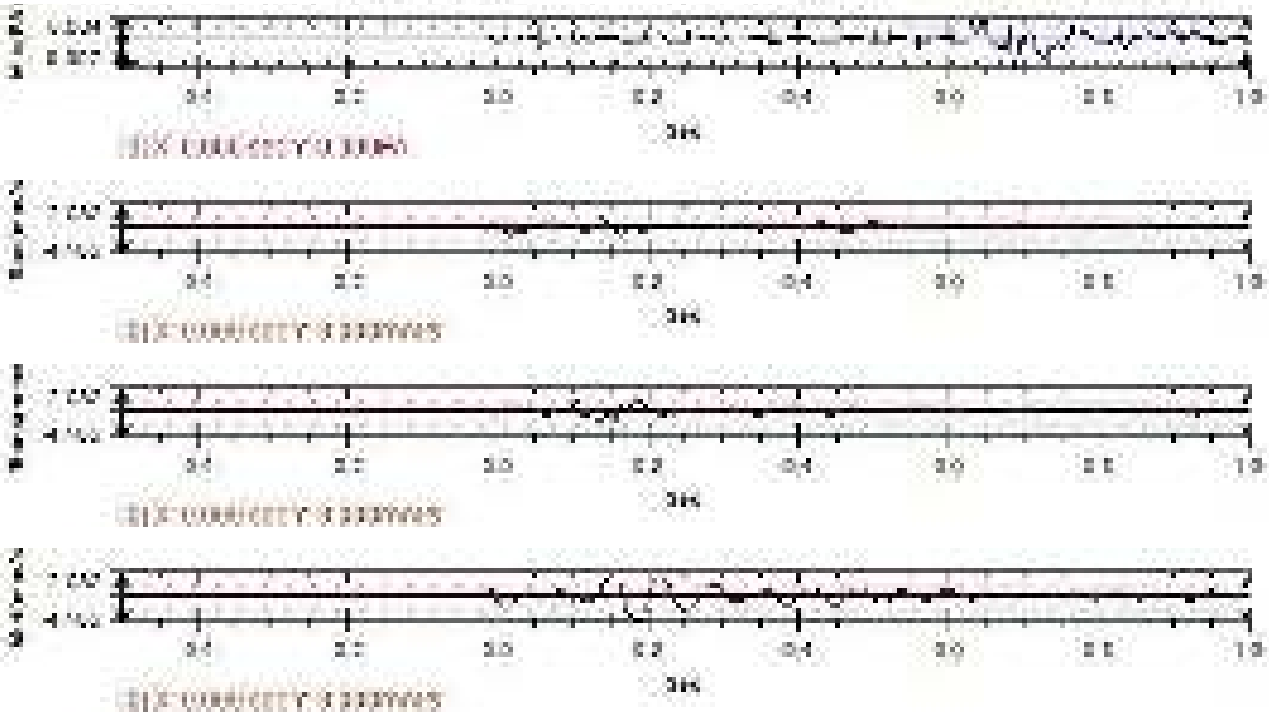
Peak Measurements

	Vertical	Transverse	Radial
PPV (mm/s)	4.165	2.243	1.992
Freq (Hz)	13.8	11.9	20.5
Time (ms)	156	186	165
PPA (g)	0.04	0.02	0.03
PPD (mm)	0.04803	0.03000	0.01547
PVS (mm/s)	4.693 @ 187.5ms		
PSPL (PA)	9.52 (113.553 dB) @ 689.5ms		
PSPL Freq	39.4Hz		
Sensor Test	Passed	Passed	Passed



System Configuration

Serial Number: V4AI118023
Calibration Date: December 21, 2021
Model: VMS-4000
Geo Trigger: 1.27 (mm/s)
Mic Trigger: Disabled
Manual Trigger: Disabled
Record Time: 1 seconds(s)
SeisWare Version Used For Download: 02.03.0000
Firmware Version: 1.00



P.O. BOX 50 ROUTE 9 SPOFFORD, NH 03462

Annexure 13

GROUP VOCATIONAL TRAINING CENTER, MAJRI AREA

TRAINING PERFORMANCE (CALADER YEAR) 2022

Year	Basic Training				Refresher Training				VT Rule Spl. Trai		Area Based Training			
	Dept		Contractor		Dept		Contractor		Dept		Dept		Contractor	
	T	A	T	A	T	A	T	A	T	A	T	A	T	A
2015	18	18	950	250	465	395	0	0	64	14	549	652	113	113
2016	333	333	623	623	471	547	2	2	45	10	360	361	0	0
2017	100	100	552	552	307	349	-	-	30	39	420	422	39	39
2018	43	43	214	214	270	333	0	0	21	36	445	313	49	49
2019	26	26	250	250	246	321	0	0	24	43	395	257	35	107
2020	16	16	347	347	250	250	200	0	0	20	0	450	505	0
2021	11	11	649	649	236	231	0	0	10	18	371	231	0	0
2021	44	44	544	544	210	221	1	1	16	16	306	290	79	100

SUMMARY OF SKILL DEVELOPMENT TRAINING CONDUCTED AT GVTC,NAJIN DURING FY -2016-2017

S.No	SKILL DEVELOPMENT TRAINING PROVIDER	Period of TRAINING (30 Days)	No. of PARTICIPANTS	EMOLUMENTS PAID (Rs.)	OTHER MISCELLENEOUS/COP (Rs.)	VILLAGES COVERED
1	COURSE: COMPUTER APPWORKING	01/10/2016 to 29/10/2016	30	60,000.00	16,700.00 (For faculty)	Patalia, Nagpuria, Paragora, Najin Khas, Kachna, Najin Colliery, Kachna Colliery
2	COURSE: DATA ENTRY OPERATOR & Sh. Rajiv Pande	—do—	30	60,000.00	30,000.00	
3	COURSE: MOBILE REPAIRING	—do—	30	60,000.00		
4	COURSE: BEAUTY PARLOUR & Smt. Kalpana	09/11/2016 to 03/12/2016	30	60,000.00	3,000.00	
5	COURSE: TAILORING & DESIGN & Smt. Kalpana	—do—	30	60,000.00	10,000.00	
6	COURSE: NURSING ASSISTANT	—do—	30	60,000.00		
7	COURSE: PARA MEDICAL	—do—	30	60,000.00		
		Total (A)	210	Rs.4,20,000.00	Rs.7,29,700.00	
8A	COURSE: UNARMED SECURITY GUARDS For Rural Youth & PAPS etc. Conducted by MSDC	09/02/2017 to 09/03/2017	40	Paid by WCL HQ	4,960.00 3,000.00 2,240.00	Patalia, Paragora, Najin Khas, Kawadi, Najin Colliery, Kachna
8B	COURSE: UNARMED SECURITY GUARDS For WCL's Newly Recruited Guards Conducted by NSDC	—do—	40	Paid by WCL HQ	700.00 8,530.00 2,000.00	
8C	Course Unarmed Security Guards Trg.for WCL's Newly Recruited Security Guards.	19/02/2017 to 17/04/2017	35	Paid by WCL HQ	1,750.00 1,34,500.00	
8D	COURSE Unarmed Security Guards Trg.for WCL's Newly Recruited Guards.	09/02/2017 to 06/05/2017	32	Paid by WCL HQ	28,000.00 18,000.00 1,840.00 8,030.00	
		Total (B)	148		2,11,545.00	
9	COURSE: ACCOUNTING WITH TALLY Conducted by MSME	20/02/2017 to 24/03/2017	35	Paid by WCL HQ	61,700.00	Patalia, Paragora, Najin Khas, Najin Colliery, Kachna
		Total (C)	35		61,700.00	
		TOTAL (A+B+C)	393	4,20,000.00	9,01,495.00	

Area Training Officer

Najin Area

SUNIL SHARMA
AREA TRAINING OFFICER
WCL

SUMMARY OF SKILL DEVELOPMENT TRAINING CONDUCTED AT GVTC MAJRI DURING FY 2018-2019

S.No.	SKILL DEVELOPMENT TRAINING IMPARTER	PERIOD OF TRAINING (Dy. Dt/s)	no. of PARTICIPANTS	ENROLMENTS PAID (Rs.)	OTHER MISCELLENOUSE EXPENSES(Rs)	VILLAGES COVERED
1	COURSE:BEAUTY PARLOUR a) Smt K.M. Kirtikar	FIRST BATCH 11/08/18 to 11/10/2018	25	75,000.00	2,750.00 500.00 30,500.00	Pulvale Nagkem Pisce ngem Pitrit Nawadi Kac hral Majri Colony Kuti n Colony
2	COURSE:TAILORINGS& DESIGN. a)Mrs.Kanta Sidam		25	75,000.00		
		TOTAL (A)	50	Rs 1,50,000.00	Rs 33,750.00	
3	COURSE: BEAUTY PARLOUR a)Smt K.M.Kirtikar b) Mangala M.Gonde	SECOND BATCH 28/10/2018 to 28/12/2018	30	24,750.00 60,000.00		
4	COURSE:TAILORINGS& DESIGN a)Smt.Kantabai Ian b) Kajal Bano c) Renuka Talande	—do—	30	24,750.00 12,750.00 37,500.00		
5	COURSE:DATA ENTRY OPERATOR a) Shri Vijay Phirke b) Shri Ashutosh Parbhkar	—do—	30	37,500.00 37,500.00		
		TOTAL (B)	60	Rs.2,25,000.00	Rs 2,25,000.00	
	GRAND TOTAL (A+B)			Rs. 6,34,500.00		

Area Training Officer
Majri Area

क्षेत्र प्रशिक्षण अधिकारी
AREA TRAINING OFFICER
माजरी क्षेत्र
MAJRI AREA

SUMMARY OF SKILL DEVELOPMENT TRAINING CONDUCTED AT DVTC, MAJURDERNI FY-2019-2020

S.No.	SKILL DEVELOPMENT TRAINING MINISTER/FACULTY	Period of TRAINING (05 Days)	No. of PARTICIPANTS	ENCAUMENTS PAID (Rs.)	OTHER MISCELLENOUS EXPENSES (Rs)	VILLAGES COVERED
1	Topic – Beauty Parlor A) Mrs. Kavita M Kalkar B) Sau. Swati N Valiya C) Sau. Shilpa B Deojadi	FIRST BATCH 12.12.19 to 04.01.20	30	30,000.00 15,000.00 30,000.00	2,13,750.00 3,150.00 3,150.00 150.00	Palala Nagbhir Pindapani Majri Kawadi Kuthni a Majri Colliery
2	Topic – Tailoring & Apparel Design A) Mrs. Kamla Solanki B) Sau. Chanda N Gondi C) Smt. Rinku Devi	FIRST BATCH 12.12.19 to 04.01.20	30	30,000.00 15,000.00 30,000.00	1,000.00 1,350.00 3,300.00 600.00 3,350.00	
3	Topic – data Entry Operator A) Shri Ashutosh D Pandekar B) Shri Mukesh D Meshram C) Shri Hemant M Kothe	FIRST BATCH 12.12.19 to 04.01.20	30	30,000.00 15,000.00 30,000.00		
		Total (A)	90	2,25,000.00	2,29,750.00	
4	Topic – Beauty Parlor D) Mrs. Kavita M Kalkar E) Sau. Swati M Valiya F) Sau. Sujata S Kalde	SECOND BATCH 24.02.20 to 21.03.20	30	30,000.00 15,000.00 30,000.00	2,13,750.00 3,300.00 1,850.00 1,000.00	Palala Nagbhir Pindapani Majri Kawadi Kuthni a Majri Colliery
5	Topic – Tailoring & Apparel Design D) Mrs. Kamla Solanki E) Sau. Chanda N Gondi F) Smt. Pooja A Dhoraw	SECOND BATCH 24.02.20 to 21.03.20	30	30,000.00 15,000.00 30,000.00	3,150.00 3,700.00 3,650.00	
6	Topic – data Entry Operator D) Shri Ashutosh D Pandekar E) Shri Uday K Bhoyar F) Shri Amit D Pandekar	SECOND BATCH 24.02.20 to 21.03.20	30	30,000.00 15,000.00 30,000.00		
		Total (B)	90	2,25,000.00	2,28,750.00	
		TOTAL (A+B)	180	Rs.4,50,000.00	Rs.4,57,500.00	
		GRAND TOTAL (A+B)		Rs. 9,07,500.00		

Nodal Training Officer
DVTC Ajni

SUMMARY OF SKILL DEVELOPMENT PROGRAMME

FOR FINAL MINE CLOSURE CLAIM OF NEW NAURIJIG MINE

Year	Type of Training	Name of Programme	No. of beneficiaries	Beneficiary villages	Amount Spent
2019-20	Skill Development Programmes	Beauty Parlour, Tailoring & Apparel designing, Data Entry Operator	180	Pataka/Kujkom Pada-ngaon Majji/Kawadi/Kusina/ Majji Colliery	1,07,800.00
2018-19		Beauty Parlour, Tailoring & Apparel designing, Data Entry Operator	140	Pataka/Kujkom/Pada-ngaon Majji/Kawadi/Kusina/Majji Colliery/Kuchna Colony	6,34,680.00
2016-17		Computer Networking, Mobile Repairing, Nursing assistance, Paramedical, Beauty Parlour, Tailoring & Apparel designing, Data Entry Operator, Unarmed Security Guard, Accounting with Tally	388	Pataka,Padangaon Majji Kawadi Majji Colliery,Kuchna	9,21,408.00
2015-16		Youths (Male)under "UDAAN", Women (Girls)under" SHAKTI" and farmer (BC) under" KISAN"	100	Command area of Majji Area	2,60,000.00
				Total	20,83,888.00

Area Training Officer
Majji Area

क्षेत्र प्रशिक्षण अधिकारी
AREA TRAINING OFFICER
मजिजी क्षेत्र
Majji Area

Email Letter

Annexure 14

Letter No
11115/WZ/Nagpur Region No II/Permit/2020/704/PLCamma_CMR2013p

भारत सरकार
Govt. of India
श्रम एवं रोजगार मंत्रालय
Ministry of Labour & Employment
खान सुरक्षा महानिदेशालय
Directorate-General of Mines Safety

NO: 11115/WZ/Nagpur Region No.II/Permit/2020/704

Date: 12/03/2021

अशोक कुमार एम आर,

खान सुरक्षा निदेशक,

नागपुर क्षेत्र संख्या II

सेवा में,

अभिकर्ता,

New Majri Ug to OC mine

मेसर्स वेस्टर्न कोलफील्ड्स लिमिटेड,

Chandrapur -442503

विषय:- Permission under regulation 196(3) of the Coal Mines Regulations, 2017 to conduct controlled deep hole blasting within 500m but beyond 100m of the dwellings/permanent buildings or structures of permanent nature not belonging to the owner in the area bounded by 1, 1A, 1B, 2, 2A, 2B, 2C, 2D, 5, 6, 7, 8, 9, 10, 11, 12, 13 and 1 at New Majri UG to OC Mine of M/s Western Coalfields Limited.

Please refer to your online application ID- 340137 dated 22/10/2019 and offline details submitted vide letter no. WCL/MA/NM/06 to OC/Agent/2023/ 715 dated 04.10.2023, enclosing therewith the plans and sections and scientific study report submitted by IIT Kharagpur, dated May 2019 on the subject mentioned above.

The matter has since been examined on the basis of the information furnished and shown on the plan(s) /section(s) submitted by you. By virtue of the power conferred on the Chief Inspector of Mines (also designated as Director-General of Mines Safety) under Regulation 196(3)of the Coal Mines Regulations, 2017 and by virtue of the authorization granted to me by the Chief Inspector of Mines (also designated as Director-General of Mines Safety) under Section 6(1) of the Mines Act, 1952, I hereby grant you permission under regulation 196(3) of the Coal Mines Regulations, 2017 to carry out controlled deep hole blasting within 500m but beyond 100m of surface structures in Shri Naga village, Pauni village, Nagpur village, 66KV overhead line of MSEB in a working area bounded by 1, 1A, 1B, 2, 2A, 2B, 2C, 2D, 5, 6, 7, 8, 9, 10, 11, 12, 13 and 1, as shown on plan no. No WCL/MA/NM/UG to OC/BO/2020/185 date: 04/10/2020 submitted with the application of New Majri UG to OC Mine of M/s Western Coalfields Limited. Subject to strict compliance of the following conditions:

1.0 No blasting shall be carried out in the mine within 100m of the surface structures, Sarji Nagar village, Pataia village, Naglone village, 66KV overhead line of MSEB and other surface structures not belonging to Owner. The blasting within 500m but beyond 100m of any building of Shivji Nagar village, Pataia village, Naglone village, 66KV overhead line of MSEB and other surface structures etc., shall be carried as per the blasting parameters fixed, patterns established and the precautions suggested by IIT Kharagpur in their report on Control Blasting study at New Majri UG to CC Mine dated May 2019.

2.0 The manager of the mine shall personally work out the pattern of holes to be drilled and conduct all blasting operations as recommended by IIT Kharagpur vide project No. : IIT-SRIC/MISNVG/2018-19-863 dated May 2019 so as to minimize ground vibration and avoid occurrence of fly rock to any dangerous extent.

3.0 The entire operations of transport of the explosive to the site of its use, drilling, stemming and blasting operations shall be carried out under direct personal supervision of an Assistant Manager having first class with specially trained supervisors and workers in accordance with the guidelines and directions of the Manager. The mine manager shall ensure that the recommendations of the controlled deephole blasting are strictly followed.

4.0 The aggregate charge of explosive in a series of shot holes connected to a particular delay detonator with the same number shall not exceed 37.00 kg and aggregate charge per round not exceed 428 kg. The peak particle velocity (PPV) shall not exceed 5mm per second at 100m distance from any of the blasted holes in a round.

5.0 Non- electric initiating device (such as shock tube initiation system) shall be used in blasting to limit the vibration and air pressure. Only 25 milli-seconds short delay detonators shall be used and jumping of delay detonators shall not be done.

6.0 The zone of 100m from the site of blasting shall be clearly demarcated in the opencast workings and on the statutory plans and sections. The statutory plans shall be kept up-to-date to a period of one (1) month.

7.0 No person including shot firer shall take shelter except in the zone beyond 100m of the quarry opening site of blasting and such shelter shall be adequately strong to protect the person from injuries by flying fragment.

8.0 The cartridge of explosive shall be lowered carefully to avoid sticking of cartridges. The length of the stemming hole shall be measured to ascertain that the cartridges are in close contact and there is no air space. In case, the length of remaining hole is not as per calculation, indicating the presence of air space, attempt shall be made to push down the charge in case of slurry cartridges. The remaining hole shall than be stemmed with moist sand.

9.0 The place where drilling is to be done, shall be thoroughly cleaned so that loose debris or loose rock lying over the area are removed.

10.0 Sand shall be used as stemming material and shall be tamped hard into the blast hole to restrict the fly of rocks.

11.0 A free face should always be maintained to achieve the existing levels of ground vibration and all loose stone pieces from blast site shall be cleared off before blasting to restrict the fly of rock.

12.0 Details of every blast giving blasting parameters, charge, delay, sequence, depth of hole, number of holes, aggregate charge per round, charge per delay, spacing, burden, type of explosives used, detonating system adopted, distance from the surface structures etc. shall be recorded in a bound paged book kept for the purpose and signed by the blaster and countersigned by the Manager.

13.0 Ground vibration of all the deep hole blasts shall be monitored, by a suitable and calibrated Vibrograph and record of the same shall be kept in a bound paged book kept for the purpose and be signed by the Blaster and Manager of the mine. A copy of the said record shall be submitted to this Directorate in every month.

.0 All blasting operations within 500m of surface structure not belonging to the owner shall be conducted by using muffling with old conveyor belt/wire mesh of 25mm in a grid of 1.2 x 1.8m in size overlain by 4.5 bags filled with sand.

15.0 In case of flying fragments due to blasting travelling for more than 50 m from site of blasting or in case of complaint of rattling of doors/windows during blasting is received, further blasting operations shall be suspended forthwith and intimation sent to the Director of Mines Safety, Nagpur Region-II and Blasting operations shall not be resumed without a fresh permission from this Directorate.

16.0 Blasting operation shall be done at fixed hours during day time only, preferably in mid-afternoon. The time of blasting shall be so arranged that there is no traffic movement on any public road during blasting operations.

17.0 The management shall indemnify the occupants of house(s), other houses, dwellings against damage to their property or injury to them or others present arising out of this blasting permission.

18.0 Controlled blasting shall be done in conjunction with Effective muffling of shots with old wire rope screen, sandbags and old conveyor belts shall be done for prevention of flying fragments to a distance not more than 100m.

19.0 The deep hole blasting in the mine shall be carried out complying with the stipulations of DGMS (Tech) Circular No. 7 of 1997, DGMS Circular No. 3 of 1985 and DGMS Circular No. 4 of 1985 and the conditions specified for Gazette notification GSR 985(E) dated 1st October 2018 under Regulation 199 of Coal Mines Regulations 2017.

20.1 The condition of blasting in fire areas in open cast mine, specified in the Gazette notification GSR 986 (E) dated 1st October 2018 under Regulation 202 of Coal Mines Regulations 2017 shall be strictly adhered to.

20.2 Conditions for transport of explosive in bulk in open cast mine, specified in the Gazette notification GSR 982 (E) dated 1st October 2018 under Regulation 188 of Coal Mines Regulations 2017 shall be strictly adhered to.

20.3 DGMS Circular No. 14 of 2020 regarding precaution against the premature blast at Site Mixed Emulsion/ Site Mixed Slurry explosives shall be strictly adhered to.

21.0 The place where drilling is to be done shall be thoroughly cleaned so that loose debris or loose rocks lying over the area are removed. No blasting shall be done in crushed, broken or sliced ground.

22.0 Please note that this permission is subject to the following additional conditions:

22.1 In the event of any change in the circumstances connected with this permission which is likely to endanger the life of the workmen employed in the mine or endanger the mine, the mining operations for which this permission has been granted shall be stopped forthwith and intimation thereof sent to this Directorate. The said mining operation shall not be resumed without an express and fresh permission in writing from this Directorate.

22.2 This permission is being issued specifically under the Regulation mentioned above and without prejudice to any other provision of law which may become applicable at any time.

22.3 If at any time any one of the conditions subject to which this permission has been granted is violated or not complied with, this permission shall be deemed to have been revoked with immediate effect.

22.4 The above permission may be amended or withdrawn at any time if considered necessary in the interest of safety.

22.5 This Directorate shall be informed as soon as mining operations are commenced in accordance with the above permission within seven days from the start of the operations. The intimation about completion of the

mining operations shall also be sent promptly and in any case not later than one month thereof.

22.6 This permission shall remain valid for a period of 5 (Five) years from the date of issue of this letter.

Yours Sincerely,

SAGHSH KUMAR M. R. (DIRECTOR - NAGPUR REGION NO.II)
THIS IS A SYSTEM GENERATED DOCUMENT, DOES NOT REQUIRE ANY SIGNATURE.

Annexure 15

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
और गंगा संरक्षण विभाग
केन्द्रीय भूमि जल प्राधिकरण
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Authority

(भूजल निकासी हेतु अनापत्ति प्रमाण पत्र)

NO OBJECTION CERTIFICATE (NOC) FOR GROUND WATER ABSTRACTION

Project Name:	M/s New Majri UG to OC Mine		
Project Address:	Near Majri Village, Wardha Valley Coalfield, Majri Area of WCL		
Village:	Majari	Block:	Bhadrawati
District:	Chandrapur	State:	Maharashtra
Pin Code:	442503		
Communication Address:	General Manager (env), Wcl (hq), , Nagpur, Nagpur, Maharashtra - 440001		
Address of CGWB Regional Office :	Central Ground Water Board Central Region, N.S. Building, Civil Lines, Nagpur, Maharashtra – 440001		

1.	**NOC No.:**	CGWA/NOC/MIN/ORIG/2020/7125			
2.	Application No.:	21-4/509/MH/MIN/2016	3.	Category:	Mining
4.	Project Status:	Existing Project	5.	NOC Type:	New
6.	**Valid from:**	09/01/2020	7.	**Valid up to:**	08/01/2022
8.	Ground Water Abstraction Permitted:				

Fresh Water		Saline Water		Dewatering		Total	
m³/day	m³/year	m³/day	m³/year	m³/day	m³/year	m³/day	m³/year
				4293.00	1566945.00	4293.00	1566945.00

9. Details of ground water abstraction /Dewatering structures

Total Existing No.:4						**Total Proposed No.:0**				
	DW	DCB	BW	TW	MP	DW	DCB	BW	TW	MP
Abstraction Structure*	0	0	0	0	4	0	0	0	0	0

*DW- Dug Well; DCB-Dug-cum-Bore Well; BW-Bore Well; TW-Tube Well; MP-Mine Pit

10.	Quantum of ground water recharge/harvesting(m³/year):	35493.00

11.	Number of Piezometers (Observation wells) to be constructed/ monitored & Monitoring mechanism.	No. of Piezometers	Monitoring Mechanism		
			Manual	DWLR**	DWLR With Telemetry
	**DWLR - Digital Water Level Recorder	2	0	1	1

(Compliance Conditions given overleaf)

Digitally signed by
NANDAKUMARAN P
Date: 2020.01.28 11:14:38 +05'30'

सदस्य (केन्द्रीय भूमि जल प्राधिकरण)
Member (CGWA)

18/11, जामनगर हाउस, मानसिंह रोड, नई दिल्ली - 110011 / 18/11, Jamnagar House, Mansingh Road, New Delhi-110011
Phone: (011) 23383561 Fax: 23382051, 23386743
Website: cgwa-noc.gov.in

Validity of this NOC shall be subject to compliance of the following mandatory conditions:

1. No additional ground water abstraction and/or de-watering structures shall be constructed for this purpose without prior approval of the Central Ground Water Authority (CGWA).
2. The proponent shall seek prior permission from CGWA for any increase in quantum of groundwater abstraction (more than that permitted in NOC for specific period).
3. All new as well as existing ground water abstraction/ de-watering structures shall be fitted with digital water flow meters by the firm at its own cost immediately on completion of their construction or grant of NOC as the case may be. In case of renewal of NOCs, all existing ground water abstraction structures shall continue to be fitted with digital water flow meters. Intimation of installation of flow meters shall be sent by the proponent to the Regional Director of CGWB within 6 months of grant of NOC. Daily ground water abstraction data shall be monitored / continue to be monitored (in case of renewal) by the firm and recorded in a log book. Details of month-wise ground water abstraction shall be submitted to the Regional Director, CGWB, once every year.
4. In case the ground water abstraction is more than 10 m^3/day, monthly water level monitoring data shall be maintained and submitted annually to the Regional Office of CGWB. Wherever groundwater withdrawal is more than 500 m^3/day, the firm shall install telemetry system in one of the piezometers and share USER ID and password of the telemetry system with the Regional Director, CGWB.
5. In case ground water abstraction is more than 10 m^3/day, ground water quality shall be monitored once in a year (during pre- monsoon period) and the report submitted to the Regional Office, CGWB. Wherever the extraction is less than 10 m^3/day, ground water quality report shall be submitted by the proponent at the time of submission of self-compliance report.
6. Ground water augmentation/harvesting measures, as stipulated in the NOC, shall be implemented (in new cases) / continue to be maintained (in case of renewal) in consultation with the concerned Regional Director, CGWB.
7. Proof of recharge/water harvesting structures constructed (photographs of structures) shall be submitted to the concerned Regional Director, CGWB within 6 months from the date of issue of NOC. The firm shall also undertake periodic maintenance of recharge/water harvesting structures at its own cost.
8. **The firm shall submit a report on the Impact of ground water withdrawal on the ground water regime in and around the project area within six months**.
9. The project proponent shall take all necessary measures to prevent contamination of ground water in the premises failing which the firm shall be responsible for any consequences arising thereupon.
10. In case of industries that are likely to contaminate the ground water, no recharge measures shall be taken up by the firm inside the plant premises. The runoff generated from the rooftop shall be stored and put to beneficial use by the firm.
11. The firm shall optimize water use through recycling/ reuse of waste water after proper treatment.
12. Wherever the NOC is for abstraction of saline water and the existing wells (s) is /are yielding fresh water, the same shall be sealed and new tubewell(s) tapping saline water zone shall be constructed within 3 months of the issuance of NOC. The firm shall also ensure safe disposal of saline residue, if any.
13. In case of mining projects, additional key wells shall be established in consultation with the Regional Director, CGWB for ground water level monitoring four (4) times a year (January, May, August and November) in core as well as buffer zones of the mine.
14. Unexpected variations in inflow of ground water into the mine pit, if any, shall be reported to the concerned Regional Director, Central Ground Water Board.
15. The firm shall report compliance of the NOC conditions online in the website (www.cgwa-noc.gov.in) within one year from the date of issue of this NOC.
16. This NOC is subject to prevailing Central/State Government rules/laws/norms or Court orders related to construction of tube well/ground water abstraction structure / recharge or conservation structure/discharge of effluents or any such matter as applicable.
17. This NOC does not absolve the proponents of their obligation / requirement to obtain other statutory and administrative clearances from appropriate authorities.
18. The issue of this NOC does not imply that other statutory / administrative clearances shall be granted to the project by the concerned authorities. Such authorities would consider the project on merits and take decisions independently of the NOC.
19. This NOC is being issued without any prejudice to the directions of the Hon'ble NGT/court orders in cases related to ground water or any other related matters.
20. Application for renewal can be submitted online from 90 days before the expiry of NOC. Ground water withdrawal, if any, after expiry of NOC shall be illegal & liable for legal action as per provisions of Environment(Protection)Act,1986.
21. **In case of any violation of NOC conditions or illegal extraction of Ground water the firm shall be liable to pay "Environmental Compensation"/ "Penalty", if any under Sec 15 of EPA 1986 as and when decided by statutory authorities.**

(Non-compliance of the conditions mentioned above is likely to result in the cancellation of NOC and legal action against the proponent.)

Government of India
Ministry of Jal Shakti
Department of Water Resources, River Development and Ganga Rejuvenation
Central Ground Water Authority (CGWA)
Application for Issue of NOC to Abstract Ground Water (NOCAP)

Application for Renewal of NOC to Dewater Ground Water for Mining Industry (Save As Draft Application for Renewal of NOC)

Application Number : 21-4/509/MH/MIN/2016

Applied For Renewal : 1st

(Scanned copy of this page after signature and seal should be attached at "Application with Signature and Seal" in attachment section before submission of application)

	Name of Industry:	NEW MAJRI UG TO OC MINE	
	Location Details of the Industrial Unit		
	Address Line 1 :	NEAR MAJRI VILLAGE, WARDHA VALLEY COALFIELD	
	Address Line 2 :	MAJRI AREA OF WCL	
	Address Line 3 :		
	State:	MAHARASHTRA	
	District:	CHANDRAPUR	
	Sub-District:	BHADRAWATI	
	Village/Town:	Majari	
	Net Ground Water:	**m3/day**	**m3/year**
		5551.00	2026115.00
	Area Type :	Non-Notified	
	Area Type Category :	Safe	

INDUSTRIAL USE- Self Declaration

I hereby certify that the data and information furnished above are true to the best of my knowledge and belief and I am aware that if any part of the data / information submitted is found to be false or misleading at any stage, the application will be rejected outright.

I hereby declare that all the mandatory documents prescribed in the application form have been uploaded and no blank /irrelevant documents have been uploaded. I am also aware that any false/ wrong submission /uploading of document will lead to rejection of my application without any notice.

It is to certify that no case related to ground water withdrawal/ contamination is pending against the industry/ project/ unit as on date. Any such case filed against the company/ project/ unit in respect of ground water withdrawal/ contamination during the pendency of this application shall be immediately brought to the notice of CGWA.

I hereby undertake that in case any environmental compensation/ penalty is imposed on the firm by any statutory authority, I shall comply with the decision of such authority.
/
मैं यह प्रमाणित करता हूं कि ऊपर प्रस्तुत किये गऐ आँकड़े और जानकारी मेरे ज्ञान और विश्वास के अनुसार सही हैं और मुझे पता है कि यदि प्रस्तुत आँकड़े / सूचना का कोई भी भाग किसी भी स्तर पर गलत या भ्रामक पाया जाता है, तो आवेदन बिना किसी पूर्व सूचना के निरस्त कर दिया जाएगा।
मैं इसके द्वारा घोषित करता हूं कि आवेदन पत्र में निर्धारित सभी अनिवार्य दस्तावेजों को अपलोड किया गया है और कोई रिक्त / अप्रासंगिक दस्तावेज अपलोड नहीं किया गया है। मुझे यह भी पता है कि कोई भी गलत दस्तावेज अपलोड करने पर मेरे आवेदन को बिना किसी सूचना के निरस्त कर दिया जाएगा।
यह प्रमाणित करता हूँ कि उद्योग / परियोजना / इकाई के खिलाफ आज तक भूजल निकासी / प्रदूषण से संबंधित कोई भी मामला किसी भी न्यायालय में लंबित नहीं है। इस आवेदन की प्रक्रिया के दौरान भूजल निकासी / प्रदूषण के संबंध में कंपनी / परियोजना / इकाई के खिलाफ दायर किसी भी मामले को तुरंत के. भू. ज. प्राधिकरण के ध्यान में लाउंगा।
मैं इस बात का वचन देता हूं कि यदि किसी भी वैधानिक प्राधिकरण द्वारा फर्म पर कोई पर्यावरणीय क्षतिपूर्ति / जुर्माना लगाया जाता है,तो मैं प्राधिकरण के उस निर्णय का पालन करूंगा।

Date : Name & Signature of the applicant

Place : (With official seal)

Associated User : gmwcl

* In case signed by any authorized signatory, the details of the signatory with the authorization shall be enclosed.

Third party Assessment of EC compliance Expansion of New Majri UG to OC Mine

Sponsor

WESTERN COALFIELDS LIMITED
MAJRI AREA

CSIR-National Environmental Engineering Research Institute, Nagpur-440020

WESTERN COALFIELDS LIMITED

ENVIRONMENTAL CLEARANCE COMPLIANCE REPORT

Clearance letter No.: J-11015/25/2008-IA.II(M)

Date : 1st January 2021

SR.NO.	Condition	Compliance Status	NEERI Remarks
4(i)	The project proponent shall obtain consent to Establish/operate from the state pollution control boards for the proposed capacity of MTPA prior to commencement.	Consent to Operate has been obtained vide letter no. Format1.0/CAC/UAN No.0000101444 /CO-2102000370 dated 05.02.2021 for capacity 3 MTY valid upto 31.03.2022	Verified from document
(ii)	Third party monitoring (by NEERI/CIMFR/IIT/NITs) for air quality shall be carried out at identified locations. Both ambient and the process area, to arrive at impact of the proposed expansion at regular interval of 3 years.	Noted. Third party monitoring (by NEERI/CIMFR/IIT/NITs) for air quality will be done within the 3 yrs of grant of EC i.e. before 01.01.2024 and same will be repeated thereafter every 3 years	No remark
(iii)	Top soil should be stored separately at marked area and necessary vegetation shall be maintained to avoid any entrainment of dust.	Top soil is being stored at designated Top Soil dump with an area of 23.50 Ha & height of 40 mtrs. Grass seeding is being done to avoid fugitive dust from dump	Verified during site visit
(iv)	PP shall construct embankment leaving 100 mtrs away from HFL of Wardha river and the same shall be taken prior approval from DGMS	Noted. However, Embankment is constructed along the diverted Koradi Nala (Length: 6.40 kms, Height: 10 mtrs, Width at top: 30 mtrs and width at bottom: 50 mtrs)	No remark
(v)	Transportation of coal from coal handling plant shall be through mechanized covered trucks for 3 years. No transportation by trucks after 3 years and proposed railway siding/pipe conveyor system.	Mechanically closed trucks are not provided by any truck maker for coal in India. However, tarpaulin covering is being ensured for all the coal transportation trucks.	Tarpaulin covered trucks are observed during site visit.
(vi)	All the villages coming under the zone of influence as in hydrology study shall be provided with suitable water supply along with sanitation	Water supply arrangements will be made for all the villages coming under zone of influence, if there is any water scarcity reported in any of the village	Verified

	facility		
(vii)	Commitment made during public consultation process shall be adhere to. As proposed, Rs.299.46 Lakhs is earmarked shall be considered as part of Environment Management Plan, which shall be accomplished within period of 5 years.	Noted. The work of Rs 7.48 Lakhs for providing tubewell at Palasgaon village is completed as per the commitment made during public hearing	Verified
(viii)	Water quality and bioassay test of Wardha River shall be monitored quarterly and submitted to State Pollution Control Board. No water shall be discharged in river. Any deviation from limits as stipulated in norms by CPCB for quality shall be informed and necessary action shall be taken.	Water quality and bioassay test of Wardha River is being monitored quarterly. (copy of reports of the month July 2021, Oct 2021 & Jan 2022 enclosed) Report of same is being submitted to MPCB, MOEF Regional offices along with six monthly EC Compliance report.	Verified

(ix)	Quarterly monitoring of quality of water from bore hole used for drinking purpose shall be conducted and report thereof shall be submitted to SPCB. Any deviation from limits as stipulated in norms by CPCB for quality shall be informed and necessary action shall be taken	Drinking water monitoring is being done on quarterly basis through CMPDIL. (copy of reports of the sampling of July 2021 & Jan 2022 enclosed) Report of same is being submitted to MPCB, MOEF Regional offices along with six monthly EC Compliance report.	Verified from report
(x)	Progressive backfilling of mine and progressive reclamation of dump shall be done	Noted and same is being done as per mining plan	No remark
(xi)	To control the production of dust at source, the crusher and in-pit belt conveyors shall be provided with mist type sprinklers. Permanent water sprinkler shall be installed instead to water sprinkling by water tankers on the haul road.	Mobile crushers are being provided with Mist Nozzles for dust suppression at source. Also, fixed sprinklers are provided at coal stockyards. Supply Order of Mist Cannon of 100 mtrs throw is issued and same are installed at near mobile crushers.	Verified during site visit
(xii)	Mitigating measures shall be undertaken to control dust and other fugitive emissions all along the roads by providing sufficient	30 nos. fixed sprinklers at coal transportation road (work in progress)	Verified during site visit

<table>
<tr>
<td></td>
<td>fixed type water sprinklers. Adequate corrective measures shall be undertaken to control dust emissions, which would include mechanized sweeping, water sprinkling/mist spraying on haul roads and loading sites, long range misting/fogging arrangement, wind barrier wall and vertical greenery system, green belt, dust suppression arrangement at loading and unloading points, etc.</td>
<td>12 nos. fixed sprinklers installed & operational at coal stockyard.

2 nos. mist cannon of 100 mtrs throw with 320 deg rotation

Mist spray arrangement in all mobile crushers

1 no. mechanised road sweeping machine (Supply Order issued)

85,000 nos. trees planted with more than 90 % survival rate as wind barrier and green belt between mine and Naglone & Palasgaon village and 15,000 nos. planted on dump.
<table>
<tr><td>FY</td><td>Nos.</td><td>Area (</td></tr>
<tr><td>2016-17</td><td>20,000 Nos.</td><td>8 Ha</td></tr>
<tr><td>2018-19</td><td>15,000 Nos.</td><td>6 Ha</td></tr>
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<tr><td>2021-22</td><td>50,000 Nos.</td><td>20 Ha</td></tr>
</table>
</td>
<td></td>
</tr>
<tr>
<td>(xiii)</td>
<td>Continuous monitoring of occupational safety and other health hazards, and the corrective actions need to be ensured.</td>
<td>Regular PME of departmental as well as contractual worker is being done for Occupational and other health hazards.

PME during Year 2020 of 217 Deptt. Worker and IME during Year 2020 of 58 Contractual worker</td>
<td>Verified from record</td>
</tr>
<tr>
<td>(xiv)</td>
<td>The total industrial water demand (peak) in operation phase shall be met by utilizing treated mine discharge water. If require, necessary arrangement shall be made to reuse treated water from STP&ETP to nearby TPP or coal washery /or future coal washery by entering suitable agreement. No wastewater (treated or untreated) shall be discharged into the river or any other water body.</td>
<td>Water demand for fire-fighting, dust suppression etc is met through mine discharge only.

ETP effluent is being recycled for washing of HEMM & STP effluent is being used for gardening purpose.

Modular STP (MBBR based) of 5 KLD capacity is provided for mine premises/ canteen and same is in acclimatization stage</td>
<td>ETP is constructed and use as an when required due lack of wastewater. The vehicles used in the mining process are outsourced. Treated water is being recycled and used for washing of HEMM.

5KLD MBBR based STP installed to treat the canteen sewage. Presently, STP under microbial cultural acclimatization stage with generated sewage as organic load.</td>
</tr>
</table>

(xv)	Blasting effect on patala village should minimised by using latest technology and quarterly health survey shall be conducted by project proponent.	Controlled blasting is being done to minimise the effect of blasting on patala village. Health survey will also be conducted once the COVID -19 pandemic will be over (as per GoM guidelines, industry is not allowed to conduct health camps etc.). Moreover, no such complaint is received from any of nearby village.	Verified
(xvi)	PP shall take permission of state public works Department before the proposed diversion of Road. Road shall be considered as per PWD requirement and plantation of trees and street light shall be provided by project proponent.	Noted. PWD Permission will be sought before the diversion of road.	No remark
(xvii)	STP for proposed colony shall be constructed within one year of implementation of colony	Noted. Modular STP of 5 KLD is provided for mine premises & same is in acclimatization stage. However, there is no colony for this mine, STP for colony will be provided whenever the colony will be constructed	No remark
(xviii)	Toe wall of atleast 15 mts height should be constructed along the OB dump.	Toe wall of adequate height wherever necessary will be constructed along OB dump	No remark
(xix)	5 Fog canon shall be installed to reduce the impact of air pollution for nearby villages.	Mist cannon of 100 mtrs throw with 320 deg rotation are provided near mobile crushers	Verified during site visit
(xx)	Water storage ponds shall be constructed of appropriate depth in nearby villages in collaboration with Gram Panchayats.	Noted. Water storage pond will be constructed if any nearby village demand for the same.	No remark
(xxi)	Peripheral tree plantation of local species in nearby village in collaboration with Gram Panchayats. 3-tier plantation with atleast 50000 trees along the patala village and nearby villages wherein no R &R is proposed shall be done within 3 years.	85,000 nos. trees of native species over an area of 34 Ha as green belt/ wind barrier between mine and nearby villages (Palasgaon, naglone) is done till October 2021. 15,000 nos. trees planted over an area of 6 Ha on Top Soil dump	Verified during site visit

<table>
<tr>
<td>(xxii)</td>
<td>3-tier Green belt along the boundary should be developed on priority basis preferably within first 3 years.</td>
<td>85,000 nos. trees of native species over an area of 34 Ha as green belt/ wind barrier between mine and nearby villages (Palasgaon, Naglone) are planted as on date on plain land. 15,000 nos. over an area of 6 Ha is planted on Top Soil dump in FY 2021-22
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</table>
</td>
<td>Plantation done over an area of 6 Ha is observed during site visit.</td>
</tr>
<tr>
<td>(xxiii)</td>
<td>Persons of nearby villages shall be given training on livelihood and skill development to make them employable.</td>
<td>Skill Development training is being organised regularly (such as Tailoring, Beauty Parlour, Computer education, Security Guard etc.) for persons living in nearby villages</td>
<td>Verified from records</td>
</tr>
<tr>
<td>(xxiv)</td>
<td>Drinking water supply shall be given to all villages coming under zone of influence by extraction of ground water.</td>
<td>Drinking water facility will be provided in nearby village wherever the water scarcity/ drinking water requirement problem noted.</td>
<td>No remark</td>
</tr>
<tr>
<td>(xxv)</td>
<td>Active OB Dump should not be kept barren/open and should be covered by Temporary grass to avoid air born of particles.</td>
<td>Noted

Grass seeding is done over embankment, Top Soil dump & OB Dump</td>
<td>No remark

Grass seeding is observed during site visit</td>
</tr>
<tr>
<td>(xxvi)</td>
<td>Project proponent to plant 150,000 nos .of native trees with broad leaves along the transportation route in three years to prevent the effect of air pollution. After completion of tree plantation. Number of trees shall be duly endorsed from District Forest Officer.</td>
<td>85,000 nos. trees of native species over an area of 34 Ha as green belt/ wind barrier between mine and nearby villages (Palasgaon, Naglone) are planted as on date on plain land. 15,000 nos. over an area of 6 Ha is planted on Top Soil dump in FY 2021-22
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</table>
</td>
<td>Plantation done over an area of 6 Ha is observed during site visit.</td>
</tr>
</table>

		Nos. Tree Plantation work is being undertaken by Madhya Pradesh Rajya Van Vikas Nigam Ltd.	
(xxvii)	Project Proponent shall obtain blasting permission from DGMS for conducting mining operation near villages and also explore development of rock breakers of suitable capacity in the project to avoid blasting very near to villages. There shall be no damages caused to habitation/structures due to blasting activity.	Blasting permission is obtained from DGMS vide letter no. 11115/WZ/Nagpur Region No. II/Perm/2020/7041 dated 12.01.2021.	Verified
(xxviii)	The project proponent shall complies with all the statutory requirements and judgment of Hon'ble Supreme Court dated the 2nd August 2017 in Writ petition (Civil) No.114 of 2014 in the matter of Common Cause versus Union of India and Ors. State Government shall ensure that the entire compensation levied. If any, for illegal mining paid by the project proponent through their respective Department in strict compliance of judgment of Hon'ble Supreme Court dated the 2nd August 2017 in writ petition (Civil) No. 114 of 2014 in the matter of common Cause versus Union of India and Ors.	Noted.	No remark
(xxix)	Project Proponent shall obtain the necessary prior permission from the Central Ground Water Authority (CGWA) in case of intersecting the Ground water table.	CGWA NOC Obtained vide NOC no. CGWA/NOC/MIN/ORIG/2020/7125 dtd 09.01.2020 valid upto 08.01.2022 and renewal of same is also applied	Verified from document
(xxx)	Proponent shall appoint an Occupational Health Specialist for Regular and Periodical medical examination of the workers engaged in the Project and maintain records accordingly; also, Occupational health check-ups for workers having some ailments like BP, diabetes, habitual smoking, etc. shall be undertaken once in six	Complied Regular and Periodical medical examination (IME and PME) of the workers (Departmental as well as contractual workers) has been undertaken at Majri Area Hospital of WCL. Area Hospiital is headed by Chief Medical Officer. There is 1 No. PME incharge and	Verified from record

	months and necessary remedial/ preventive measures taken accordingly. The Recommendations of National Institute for ensuring good occupational environment for mine workers shall be implemented; The prevention measure for burns, malaria and provision of anti-snake venom including all other paramedical safeguards may be ensured before initiating the mining activities	1 No. PME co-in charge with appropriate medical qualifications. There are five assisting Doctors. In addition, there is 1 No. PME Clerk and 2 Nos assisting category workers.	
(xxxi)	Project Proponent shall follow the mitigation measures provided in office memorandum No.Z-11013/57/2014-IA.II (M), dated 29october, 2014, titled "Impact of mining activities on Habitations-Issues related to the mining Projects wherein Habitations and villages are the part of mine lease areas or Habitations and villages are surrounded by the mine lease area".	Noted and is being complied	No remark
(xxxii)	The illumination and sound at night at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Habitations have a right for darkness and minimal noise levels at night. PPs must ensure that the biological clock of the villages is not disturbed; by orienting the floodlights/ masks away from the villagers and keeping the noise levels well within the prescribed limits for day light/ night hours.	Noted Illumination and sound survey of nearby habitation at night was done during the period 20.10.2019 to 10.11.2019 It is ensured that the biological clock of the villages is not disturbed; by orienting the floodlights/ masks away from the villagers and keeping the noise levels well within the prescribed limits for day light/night hours	Verified report
(xxxiii)	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna, spotted in the study area. Action plan for conservation of flora and fauna shall be implemented in consultation with the State Forest and Wildlife Department. A copy	There is no endangered fauna & flora species observed during the Biodiversity study in the study area	Report verified

	of action plan shall be submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office.		
(xxxiv)	Hon'ble Supreme Court in an writ petition (s) Civil No. 114/2014,Common Cause vs Union on India & Ors vide its judgement dated 8th January, 2020 has directed the union of India to impose a condition in the mining lease and a similar condition in the environmental clearance and the mining plan to the effect that the mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturb due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc. Compliance of this condition after the mining activity is over at the cost of the mining lease holders/Project Proponent". The implementation report of the above said condition shall be sent to the Regional Office of the MoEFCC.	Noted. Grass seeding of embankment is already been done. Also, grass seeding of top soil dump and OB dump will be done once dump become inactive.	No remark Grass seeding is observed during site visit
(xxxv)	PP shall submit mine closure report/activity of Telwasa OC (2.00 MTPA) and Dhorwasa OC (2.00 MTPA) and status to ministry regional office within six months.	Progressive mine closure claim is audited by NEERI (as third party auditing agency) and CCO team during 2020-21	Verified report

Specific condition with respect area being in CPAs

(i)	CTE/CTO for the project shall be obtained from the SPCB as required under the Air(Prevention and control of pollution) Act,1981 and the water (Prevention of control of Pollution) Act,1974, and the SPCB shall follow the mechanism/protocol issued by the Ministry vide letter no.Q-16017/38/2018-CPA dated 24october,2019 while issuing the CTE/CTO for the project, for improvement of environment of environmental quality in the area.	Consent to Operate for capacity 3 MTY has been obtained vide letter no. Format1.0/CAC/UAN No.0000101444 /CO-2102000370 dated 05.02.2021 valid upto 31.03.2022.	Verified from document
(ii)	The green belt of at least 5-10 m width shall be developed in more than 40% of the total project area, mainly along the periphery of mine boundary, in downward wind direction, and along road sides etc. Selection of plant species shall be as per the CPCB guidelines in consultation with the State Forest Department.	Green belt of more than 10 mtrs has been developed on Western boundary of mine between Mine and Naglone & Palasgaon village. As on date 85,000 nos. trees of native species planted over an area of 34 Ha on plain land and 15,000 nos. over an area of 6 Ha on Top Soil Dump.	Verified during site visit
(iii)	In addition, the project proponent shall develop greenbelt outside the plant premises such as avenue plantation, plantation in vacant areas, social forestry etc.	Noted Avenue/ Road side plantation is being done Plants distribution to nearby villages (such as Majri, Vislon, Naglone, Patala etc) as steps towards collaboration with nearby villages and increasing green cover in nearby village area	No remark
(iv)	Monitoring of compliance of EC condition may be submitted with third party audit every year.	Noted and Work for same is awarded to NEERI, Nagpur vide award letter no. WCL/HQ/ENV/16-J/73-81 dated 26.10.2021 and NEERI team visited the mines for inspection on 29.03.2022	This is report for the same
(v)	Fund allocation for Corporate Environment Responsibility (CER) which is atleast 2 times as per OM of 1st May,2014 may now be considered as 2 time of fund	Noted and same will be spent over the coming years	No remark

	allocated on commitment made during public consultation process for incorporating in EIA-EMP for deliberation of EAC and item-wise details along with time bound action plan shall be prepared and submitted to the Ministry's Regional Office.		
(vi)	Effective fugitive emission control measures should be imposed in the process, transportation, packing etc.	Complied. 12 nos. fixed sprinklers are provided to control fugitive emission from Coal stockyard 30 nos. fixed sprinklers to control fugitive emission on coal transportation road (work in progress) 2 nos. 28 KL and 2 nos. 15 KL Mobile water tankers are deployed on Coal transportation road and haul road 2 nos. mist cannon of 100 mtrs throw with 320 deg rotation Mist spray arrangement in all mobile crushers 1 no. mechanised road sweeping machine (Supply Order issued) Grass seeding over embankment, green belt between mine OB dumps and mine boundary	Verified during site visit
(vii)	Transportation of materials by rail/ conveyor belt to be implemented with the implementation of stipulation given in EC.	Noted and is being complied All the coal from mine is dispatched through Rail mode as per Coal Supply Agreement with Thermal power plants	No remark
(viii)	A detailed water harvesting plan may be submitted by the project proponent	Rain Water Harvesting Pond of dimension 88 mtr x 18 mtr x 1.20 m costing Rs 7.62 Lakhs has been constructed by considering the long term benefits. It helps in augmenting ground water resources.	Verified during site visit

		Moreover, the galleries of old abandoned Underground mine (New Majri UG mine no. III) acts as a ground water recharge structure also.	
(ix)	In case, domestic waste water generation is more than 10 KLD, the industry may install STP.	Modular STP for mine premises of 5 KLD Capacity is provided for canteen and other domestic waste and same is in acclimatization stage.	5KLD MBBR based STP installed to treat the canteen sewage. Presently, STP under microbial cultural acclimatization stage with generated sewage as organic load.
(x)	Monitoring of compliance of EC conditions may be submitted with third party audit every year	Noted and is being complied. Inspection of NEERI team held on 29.03.2022	This is report for the same

4.1 The grant of environmental clearance is further subject to compliance of the Standard EC conditions as under:

(A) Statutory Compliance

4(i)	The project proponent shall obtain forest clearance under the provisions of forest (Conservation) Act,1986,in case of the diversion of forest land for non-forest purpose involved in the project.	Not Applicable	No remark
(ii)	The project proponent shall obtain clearance from the National Board Wildlife, if applicable.	Not Applicable	No remark
(iii)	The project proponent shall prepare a site-specific conservation plan/ wildlife management plan and approved by the chief wildlife warden. The recommendation of the approved site-specific conservation plan/wildlife management plan shall be implemented in consultation with the state forest department. The implementation report shall be furnished along with the six monthly compliance report (in	Not Applicable as the mine and its surrounding area does not have any schedule-I species	No remark

	case of the presence of schedule-1 species in the study area).		
(iv)	The project proponent shall obtain consent to establish/operate under the provisions of Air (Prevention &Control of Pollution) Act,1981 and the water (Prevention& Control of Pollution) Act,1974 from the concerned State pollution Control Board/Committee.	Consent to Operate for capacity 3 MTY has been obtained vide letter no. Format1.0/CAC/UAN No.0000101444 /CO-2102000370 dated 05.02.2021 valid upto 31.03.2022.	Verified renewal application
(v)	The project proponent shall obtain the necessary permission from the Central Ground Water Authority.	CGWA NOC Obtained vide NOC no. CGWA/NOC/MIN/ORIG/2020 /7125 dtd 09.01.2020 valid upto 08.01.2022 and renewal of same is also applied	Verified renewal application
(vi)	Solid/hazardous waste generated in the mines needs to addressed to the solid waste management rules,2016/hazardous & other waste management rules,2016.	Noted and is being complied. Hazardous waste such as Oil filter/ hose pipes, ETP Sludge and Burnt Oil is being disposed off as per Hazardous waste Management rules	Verified

(B) Air Quality Monitoring And Preservation

(i)	Continuous ambient air quality monitoring stations as prescribed in the statue be established in the core zone as well as in the buffer zone for monitoring of pollutants, namely PM10, PM2.5, SO2, and NOx. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the state pollution control board. Online ambient air quality monitoring stations may also be installed in addition to the regular monitoring stations as per the requirement and/ or in consultation with the SPCB. Monitoring of heavy metals such as hg. As, Ni, Cd ,Cr ,etc	1 no. CAAQMS along with MET station is operational in mine core zone and same was installed in consultation with MPCB. Apart from this 4 nos. AAQ monitoring stations are also set up for AAQ monitoring on fortnightly basis. Heavy Metal monitoring is being monitored on half yearly basis through CMPDIL (NABL accredited lab)	Verified during site visit

	to be carried out at least once in six months.		
(ii)	The Ambient Air Quality monitoring in the core zone shall be carried out to ensure the Coal Industry Standards notified vide GSR 742 € dated 25th September, 2000 and as amended from time to time by the Central Pollution Control Board. Data on ambient air quality and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring data shall be regularly reported to the Ministry/ Regional Office and to the CPCB/SPCB.	Monitoring of Ambient Air Quality is being carried out as per GSR 742 (E) dated 25.09.2000. Data on ambient air quality is being monitored on fortnightly basis and heavy metals such as Hg, As, Ni, Cd, Cr is being monitored on half yearly basis and same is being reported to the Ministry/ Regional Office and to the MPCB along with six monthly EC Compliance report The ambient air quality monitoring stations are established in consultation with officials of Maharashtra Pollution Control Board, Chandrapur. Monitoring reports for the period from April 2021 to September 2021 is enclosed. It can be seen that all the parameters are within the prescribed standards. Monitoring of Heavy metals has also been carried out by CMPDIL in the month of May & Nov 2021	Verified during site visit

(PM10) Values of µg/m³

Date	Contractor camp	Patala Magazine	Manager office	
APR 21 (1st FN)	109	105	102	
APR 21 (2nd FN)	118	120	117	
MAY 21 (1st FN)	105	115	91	
MAY 21 (2nd FN)	110	125	106	
JUNE 21 (1st FN)	127	150	106	
JUNE 21 (2nd FN)	120	135	115	
JULY 21 (1st FN)	100	110	133	
JULY 21 (2nd FN)	107	123	142	
AUG 21 (1st FN)	147	121	127	
AUG 21 (2nd FN)	131	133	155	
SEPT 21 (1st FN)	137	115	133	
SEPT 21 (2nd FN)	120	103	117	
Std	**250**	**250**	**250**	

(PM2.5) Values of µg/m³

Date	Contractor camp	Patala Magazine	Manager office	
APR 21 (1st FN)	32	34	28	
APR 21 (2nd FN)	36	36	33	
MAY 21 (1st FN)	28	31	24	
MAY 21 (2nd FN)	33	38	30	
JUNE 21 (1st FN)	32	40	26	
JUNE 21 (2nd FN)	30	36	28	
JULY 21 (1st FN)	30	36	40	

		JULY 21 (2nd FN)	35	30	44	
		AUG 21 (1st FN)	40	32	36	
		AUG 21 (2nd FN)	33	38	39	
		SEPT 21 (1st FN)	32	34	40	
		SEPT 21 (2nd FN)	28	30	36	
		Std	**60**	**60**	**60**	

(iii)	Transportation of coal, to the extent permitted by road, shall be carried out by covered trucks/conveyors. Effective control measures such as regular water/ mist sprinkling/ rain gun etc shall be carried out in critical areas prone to air pollution (with higher values of PM10/PM2.5) such as haul road, loading/ unloading and transfer points. Fugitive dust emissions from all sources shall be controlled regularly. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central/ State Pollution Control Board.	Coal transportation through road is being done only from mine to common Railway Siding (which comes under mine boundary of adjacent mine) and same is being done through tarpaulin covered coal transportation trucks. 10 nos. fixed sprinklers of 30 mtrs throw are installed at common Railway Siding Dust suppression arrangement on Coal transportation route through mobile tankers is being done. And work of installation of 30 nos. fixed sprinklers for coal transportation road in progress 1 no. Mobile sweeping machine for removal of accumulated dust from Coal transportation road (Supply order issued). 12 nos. fixed sprinklers are provided to control fugitive emission from Coal stockyard All the mobile crushers are provided with Mist sprayers 2 nos. 28 KL and 2 nos. 15 KL Mobile water tankers are deployed on Coal transportation road and haul road 2 nos. Mist cannon of 100 mtrs throw with 320 deg rotation	Verified during site visit
(iv)	The transportation of coal shall be carried out as per the provisions and route envisaged in the approved Mining Plan or environment monitoring plan. Transportation of the coal through the existing road passing through any village shall be avoided. In case, it is proposed to construct the by-pass road, it should be	Noted and is being complied	No remark

	constructed so that the impact of sound, dust and accidents could be appropriately mitigated.		
(v)	Vehicular emissions shall be kept under control and regularly monitored. All the vehicles engaged in mining and allied activities shall operate only after obtaining 'PUC' certificate from the authorized pollution testing centres.	All the light vehicles namely jeep & trucks etc. having valid PUC certificate for vehicular emission through RTO approved agency are used.	Verified from record
(vi)	Coal stock pile/ crusher/ feeder and breaker material transfer points shall invariable be provided with dust suppression system. Belt-conveyor shall be fully covered to avoid air borne dust. Side cladding all along the conveyor gantry should be made to avoid air borne dust. Drills shall be wet operated or fitted with dust extractors.	12 nos. fixed sprinklers are provided to control fugitive emission from Coal stockyard & work of installation of 30 nos. fixed sprinklers for coal transportation road in progress All the mobile crushers are provided with Mist sprayers 2 nos. 28 KL and 2 nos. 15 KL Mobile water tankers are deployed on Coal transportation road and haul road 2 nos. Mist cannon of 100 mtrs throw with 360 deg rotation are provided near Mobile crushers Drills are wet operated	Verified during site visit
(vii)	Coal handling plant shall be operated with effective control , measures w .r. t. various environmental parameters. Environmental friendly sustainable technology should be implemented for mitigating such parameters.	Mobile crushers are provided with Mist sprayers. This will help in controlling localised dust emission. Fixed sprinklers at common CHP Premises (CHP of adjacent mine) with mist and water spray nozzles at transfer points, feeder breaker, crushers, on conveyor belts etc. Conveyors are completely covered with side cladding. 2 nos. Mist cannon of 100 mtrs throw with 320 deg rotation are provided near Mobile crushers & 1 no. mist cannon with 100 mtr throw and 320 deg rotation provided near railway Siding	Verified during site visit

(C) Water Quality Monitoring And Preservation

<table>
<tr><td>(i)</td><td>The effluent discharge (mine waste water, workshop effluent) shall be monitored in terms of the parameters notified under the water Act, 1974 Coal Industry Standards vide GSR 742 € dated 25th September, 2000 and as amended from time to time by the Central Pollution Control Board.</td><td>Mine Water discharge, Workshop ETP effluent is being monitored vide GSR 742 E dated 25th September, 2000.

MINE WATER DISCHARGE

<table>
<tr><td>Date</td><td>pH</td><td>COD</td><td>TSS</td><td>O&G</td></tr>
<tr><td>APR 21 (1st FN)</td><td>7.32</td><td>24</td><td>32</td><td>BDL</td></tr>
<tr><td>APR 21 (2nd FN)</td><td>7.56</td><td>26</td><td>28</td><td>BDL</td></tr>
<tr><td>MAY 21 (1st FN)</td><td>7.30</td><td>20</td><td>36</td><td>BDL</td></tr>
<tr><td>MAY 21 (2nd FN)</td><td>7.25</td><td>18</td><td>40</td><td>BDL</td></tr>
<tr><td>JUNE 21 (1st FN)</td><td>8.10</td><td>30</td><td>48</td><td>BDL</td></tr>
<tr><td>JUNE 21 (2nd F)</td><td>8.05</td><td>34</td><td>40</td><td>BDL</td></tr>
<tr><td>JULY 21 (1st FN)</td><td>7.44</td><td>36</td><td>20</td><td><2</td></tr>
<tr><td>JULY 21 (2nd FN)</td><td>7.59</td><td>40</td><td>24</td><td><2</td></tr>
<tr><td>AUG 21 (1st FN)</td><td>7.32</td><td>36</td><td>22</td><td>BDL</td></tr>
<tr><td>AUG 21 (2nd FN)</td><td>7.56</td><td>40</td><td>28</td><td>BDL</td></tr>
<tr><td>SEPT 21 (1st FN)</td><td>7.73</td><td>24</td><td>20</td><td>BDL</td></tr>
<tr><td>SEPT 21 (2nd FN)</td><td>7.94</td><td>36</td><td>26</td><td>BDL</td></tr>
</table>
WORKSHOP ETP EFFLUENT

<table>
<tr><td>Date</td><td>pH</td><td>COD</td><td>TSS</td><td>O&G</td></tr>
<tr><td>APR 21 (1st FN)</td><td>7.66</td><td>28</td><td>40</td><td>BDL</td></tr>
<tr><td>APR 21 (2nd FN)</td><td>7.54</td><td>30</td><td>44</td><td>BDL</td></tr>
<tr><td>MAY 21 (1st FN)</td><td>7.44</td><td>20</td><td>24</td><td>BDL</td></tr>
<tr><td>MAY 21 (2nd FN)</td><td>7.30</td><td>22</td><td>32</td><td>BDL</td></tr>
<tr><td>JUNE 21 (1st FN)</td><td>7.77</td><td>20</td><td>44</td><td>BDL</td></tr>
<tr><td>JUNE 21 (2nd F)</td><td>7.90</td><td>22</td><td>40</td><td>BDL</td></tr>
<tr><td>JULY 21 (1st FN)</td><td>7.72</td><td>32</td><td>26</td><td><2</td></tr>
<tr><td>JULY 21 (2nd FN)</td><td>7.90</td><td>28</td><td>20</td><td><2</td></tr>
<tr><td>AUG 21 (1st FN)</td><td>7.45</td><td>32</td><td>20</td><td>BDL</td></tr>
<tr><td>AUG 21 (2nd FN)</td><td>7.69</td><td>28</td><td>18</td><td>BDL</td></tr>
<tr><td>SEPT 21 (1st FN)</td><td>7.56</td><td>48</td><td>32</td><td>BDL</td></tr>
<tr><td>SEPT 21 (2nd FN)</td><td>7.70</td><td>40</td><td>30</td><td>BDL</td></tr>
</table>
</td><td>Verified report</td></tr>
<tr><td>(ii)</td><td>The monitoring data shall be uploaded on the company's website and displayed at the project site at a suitable location. The circular No.J-20012/1/2006-IA.11 (M) dated 27th May, 2009 issued by Ministry of Environment, Forest and Climate Change shall also be referred in this regard for its compliance.</td><td>Noted and is being complied</td><td>No remark</td></tr>
<tr><td>(iii)</td><td>Regular monitoring of ground water level and quality shall be carried out in and around the</td><td>Regular monitoring of ground water level and quality is being carried out in</td><td>Verified report</td></tr>
</table>

	mine lease area by establishing a network of existing wells constructing new piezometers during the mining operations. The monitoring of ground water levels shall be carried out four times a year i.e. pre-monsoon, monsoon, post-monsoon and winter. The ground water quality shall be monitored once a year, and the data thus collected shall be sent regularly to MOEFCC/ RO.	and around the mine lease. The monitoring is carried out four times in a year pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January) and the data thus collected is being sent regularly to Ministry of Environment, Forest and Climate Change and its Regional Office, Central Ground Water Authority and Regional Director, Central Ground Water Board Report of the monitoring (December 2019 to July 2021) has been submitted to CGWB and MoEF vide e.mail dated 18.11.2021	
(iv)	Monitoring of water quality upstream and downstream of water bodies shall be carried out once in six months and record of monitoring data shall be maintained and submitted to the Ministry of Environment, Forest and Climate Change/ Regional Office.	Monitoring of water quality upstream and downstream of water bodies is being carried out regularly and report of same is also submitted to MPCB & MoEF on regular basis. Copy of latest report (Jan 2022) enclosed	Verified from report
(v)	Ground water, excluding mine water, shall not be used for mining operations. Rainwater harvesting shall be implemented for conservation and augmentation of ground water resources.	Complied Ground water excluding mine water is not being used for mining operations. Rain Water Harvesting Pond of dimension 88 mtr x 18 mtr x 1.20 m has been constructed by considering the long term benefits. It helps in augmenting ground water resources.	Verified during site visit
(vi)	Catch and/ or garland drains and siltation ponds in adequate numbers and appropriate size shall be constructed around the mine working, coal helps & OB dumps to prevent run off of water and flow of sediments directly into the river and water bodies, further, dump material shall be properly consolidated/	Garland drains of dimension (Length: 3000 mtr, Avg. width: 2.50 mtr, Avg. Depth: 2.00 mtr) is provided around the mine. Catch drain of dimension (Length: 1000 mtr, Avg. width: 2.50 mtr, Avg. Depth: 2.00 mtr) provided around OB dumps.	Verified during site visit

	compacted and accumulation of water over dumps shall be avoided by providing adequate channels for flow of sit into the drains. The drains/ ponds so constructed shall by regularly de-silted particularly before onset of monsoon and maintained properly. Sump capacity should provide adequate retention period to allow proper settling of silt material. The water so collected in the sump shall be utilised for dust suppression and green belt development and other industrial use. Dimension of the retaining wall constructed, if any, at the toe of the OB dumps within the mine to check run-off and siltation should be based on the rainfall data. The plantation of native species to be made between toe of the dump and adjacent field/ habitation/ water bodies.	Desilting of catch drains and garland drains is done every year before onset of monsoon departmentally. The catch drains provided all around the OB Dump acts as an arrestor against any flow of silt and sediments into the nearby fields/ nalla. As such specifically, at present there is no requirement of retaining wall at the toe of the dump. Moreover, grass seeding has been placed over the slopes which further protects the flow of silts and sediments.	
(vii)	Adequate groundwater recharge measures shall be taken up for augmentation of ground water. The project authorities shall meet water requirements of nearby village(s) after due treatment conforming to the specific requirements(standards).	Rain Water Harvesting Pond of dimension 88 mtr x 18 mtr x 1.20 m has been constructed by considering the long term benefits. It helps in augmenting ground water resources. If any water requirement issue at nearby village come to the notice, project authority will take all necessary measures to fulfil the requirement.	Verified during site visit
(viii)	Industrial waste water generated from CHP, workshop and other waste water, shall be properly collected and treated so as to conform to the standards prescribed under the standards prescribed under water Act, 1974 and Environment (Protection) Act,1986 and the rules made there under, and as amended from time to time. Adequate	ETP of 100 KLD capacity with Oil Skimmer is provided for treating the effluent generated from washing of HEMM ETP Effluent	Verified during site visit

Date	pH	COD	TSS	O&G	
APR 21 (1st FN)	7.66	28	40	BDL	
APR 21 (2nd FN)	7.54	30	44	BDL	
MAY 21 (1st FN)	7.44	20	24	BDL	
MAY 21 (2nd FN)	7.30	22	32	BDL	
JUNE 21 (1st FN)	7.77	20	44	BDL	
JUNE 21 (2nd F)	7.90	22	40	BDL	
JULY 21 (1st FN)	7.72	32	26	<2	
JULY 21 (2nd FN)	7.90	28	20	<2	

	ETP/STP needs to be provided.	AUG 21 (1st FN)	7.45	32	20	BDL	
		AUG 21 (2nd FN)	7.69	28	18	BDL	
		SEPT 21 (1st FN)	7.56	48	32	BDL	
		SEPT 21 (2nd FN)	7.70	40	30	BDL	
		At present all the workers of this mine are residing at old colony of erstwhile New Majri UG Mine no. III wherein the sewage generated is treated through Septic tank & Soak Pits. STP of suitable capacity will be constructed along with the construction of new quarters for the workers of New Majri UG to OC mine. 1 no. Modular STP for mine premises/ canteen is also constructed & same is in acclimatization stage					
(ix)	The water pumped out from the mine, after siltation, shall be utilised for industrial purpose viz. watering the mine area, roads, green belt development etc. The drains shall be regularly desilted particularly after monsoon and maintained properly.	Water pumped out of mine galleries after siltation is being used for dust suppression, fire fighting etc.					Verified during site visit
(x)	The surface drainage plan including surface water conservation plan for the area of influence affected by the said mining operations, considering the presence of rive/ rivulet/pond/lake etc, shall be prepared and implemented by the project proponent. The surface drainage plan and/or any diversion of natural water courses shall be as per the approved Mining Plan/EIA/EMP report and with due approval of the concerned State/GoI Authority. The construction of embankment to prevent any danger against inrush of surface water into the mine should be as per the approved Mining Plan and as per the permission of DGMS or any other authority as prescribed by the law.	Noted and A detailed report on riverine eco- system has been prepared. Copy of same enclosed The Mining activity is strictly carried out as per the approved Mining Plan and with due permission of DGMS. The same will continue to be operated as per the above. There is no such diversion of any nullah. The plan as prepared and will be implemented.					Report verified

(xi)	The project proponent shall take all precautionary measures to ensure riverine/riparian ecosystem in and around the coal mine up to a distance od 5 km. A rivarine/riparian ecosystem conservation and management plan should be prepared and implemented in consultation with the irrigation/water resources department in the state government.	Noted. Rivarine/ riparian ecosystem conservation and management plan is prepared and same will be implemented in consultation with the irrigation/water resources department in the state government. Copy of same is enclosed	Report verified

(D) Noise And Vibration Monitoring And Prevention

(i)	Adequate measures shall be taken for control of noise levels as per Noise Pollution Rules, 2016 in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with personal protective equipments (PPE) like ear plugs/muffs in conformity with the prescribed norms and guidelines in this regard, Adequate awareness programme for users to be conducted. Progress in usage of such accessories to be monitored.	Adequate measures namely proper maintenance of HEMM and controlled blasting is being done so as to control noise levels below 85 dB(A). The workers engaged in noisy environment are provided with ear plugs/muffs. Noise Monitoring stations are established for monitoring the noise level data and regularly monitored.	Verified from report

Noise levels in dB (A)

Date	Pit Office		Colony	
	Day	Night	Day	Night
APR 21 (1st FN)	54.50	54.20	44.70	43.70
APR 21 (2nd FN)	53.50	52.70	43.40	42.70
MAY 21 (1st FN)	65.40	64.20	48.20	47.90
MAY 21 (2nd FN)	48.20	47.90	47.30	46.80
JUNE 21 (1st FN)	63.40	62.10	45.90	44.30
JUNE 21 (2nd F)	62.40	61.90	44.80	43.20
JULY 21 (1st FN)	48.70	45.40	46.50	44.70
JULY 21 (2nd FN)	45.40	42.70	46.70	43.80
AUG 21 (1st FN)	52.60	49.80	45.20	44.40
AUG 21 (2nd FN)	48.90	47.40	43.60	42.40
SEPT 21 (1st FN)	50.70	49.60	44.50	43.20
SEPT 21 (2nd FN)	52.70	50.50	44.30	42.30
STD	**75**	**70**	**55**	**45**

(ii)	Controlled blasting techniques shall be practised in order to mitigate ground vibrations, fly rocks, noise and air blast etc., as per the guidelines prescribed by the DGMS.	Controlled blasting is being done as per DGMS guidelines with cord relay and shock tubes.	Verified from report

(iii)	The noise level survey shall be carried out as per the prescribed guidelines to access noise exposure of the workman at vulnerable points in the mine premises, and report in this regard shall be submitted to the ministry/ RO on six-monthly basis.	Noise level survey shall be carried out as per the DGMS guidelines to access noise exposure of the workman at vulnerable points in the mine premises	Verified

(E) Mining Plan

(i)	Mining shall be carried out under strict adherence to provisions of the Mines Act 1952 and subordinate legislations made there-under as applicable.	Noted and is being complied	No remark
(ii)	Mining shall be carried out as per the approved mining plan(including Mine Closure Plan) abiding by mining laws related to coal mining and the relevant circulars issued by Directorate General Mines Safety (DGMS).	Noted and is being complied	No remark
(iii)	No mining shall be carried out in forest land without obtaining Forestry Clearance as per Forest (Conservation) Act,1980.	Noted and complied There is no forest land involved in this project	No remark
(iv)	Efforts should be made to reduce energy and consumption by conservation, efficiency improvements and use of renewable energy.	Noted. Steps of energy conservation such as energy efficient lighting are being taken in mines	No remark

(F) Land Reclamation

(i)	Digital survey if entire lease hold area/ core zone using Satellite Remote Sensing survey shall be carried out at least once in three years for monitoring land use pattern and report in 1;50,000 scale or as notified by Ministry of Environment, Forest and Climate Change (MOEFCC) from time to time shall be	Land use pattern of the mine is studied every 3 year through Satellite imagery. Monitoring of same has been done by CMPDIL in 2021. Report of same is uploaded on WCL Website (http://www.westerncoal.in/?q=node/270).	Verified from website

<table>
<tr><td></td><td>submitted to MOEFCC/Regional Office (RO).</td><td></td><td></td></tr>
<tr><td>(ii)</td><td>The final mine void depth should preferably be as per the approved Mine Closure Plan, and in case it exceeds 40 m, adequate engineering interventions shall be provided for sustenance of aquatic life therein. The remaining area shall be backfilled and covered with thick and alive top soil. Post-mining land be rendered usable for agricultural/ forestry purposes and shall be diverted. Further action will be treated as specified in the guidelines for preparation of Mine Closure Plan issued by the Ministry of coal dated 27th August,2009 and subsequent amendments.</td><td>Noted

Adequate care will be taken to sustain aquatic life as the void depth will be more than 40 mtr as per mine closure plan once the mine is closed.

Backfilled area will be reclaimed by plantation or other useful purposes.

Mine closure plan/ guidelines will be followed.</td><td>No remark</td></tr>
<tr><td>(iii)</td><td>The entire excavated area, backfilling, external OB dumping (including top soil) and afforestation plan shall be in conformity with the “during mining”/”post mining” land-use pattern, which is an integral part of the approved Mining Plan and the EIA/ EMP submitted to this Ministry. Progressive compliance status vis-à-vis the post mining land use pattern shall be submitted to the MOEFCC/RO.</td><td>PLANTATION PROG. AS PER EMP
<table><tr><td rowspan="2">Year</td><td colspan="2">Dumps</td><td colspan="2">Backfilled</td><td colspan="2">Others</td></tr><tr><td>Area (Ha)</td><td>Nos.</td><td>Area (Ha)</td><td>Nos.</td><td>Area (Ha)</td><td>Nos.</td></tr><tr><td>1st yr</td><td>0</td><td>0</td><td>0</td><td>0</td><td>20</td><td>500000</td></tr><tr><td>5th yr</td><td>0</td><td>0</td><td>0</td><td>0</td><td>50.2</td><td>125500</td></tr><tr><td>10th yr</td><td>60</td><td>150000</td><td>0</td><td>0</td><td>70.2</td><td>175500</td></tr><tr><td>15th yr</td><td>84.6</td><td>211500</td><td>0</td><td>0</td><td>90.2</td><td>225500</td></tr><tr><td>End of life</td><td>84.6</td><td>211500</td><td>0</td><td>0</td><td>150.2</td><td>375500</td></tr></table>
ACTUAL PLANTATION AS ON DATE

2016-17 = 20,000 Nos. over an area of 8 Ha (PLAIN)

2018-19 = 15,000 Nos. over</td><td></td></tr>
</table>

		an area of 6 Ha (PLAIN) 2019-20 = 15,000 Nos. over an area of 6 Ha (PLAIN) 2021-22 = 35,000 Nos. over an area of 14 Ha (PLAIN) & 15,000 Nos. over an area of 6 Ha (TOP SOIL DUMP)	
(iv)	Fly ash shall be used for external dump of overburden, backfilling or stowing of mine as per provisions contained in clause (i) and (ii) of subparagraph (8) of fly ash notification issued vide SO 2804 (E) dated 3rd November,2009 as amended from time to time. Efforts shall be made to utilize gypsum generated from Flue Gas Desulfurization (FGD),if any, along with fly ash for external dump of overburden, backfilling of mines. Compliance report shall be submitted to Regional Office of MoEFCC, CPCB and SPCB.	Noted As per the notification, fly ash backfilling is to be done in abandoned coal mines. Fly ash for backfilling will be utilised as per notification at the end of mine life when the mine gets abandoned.	No remark
(v)	Further, it may be ensured that as per the time schedule specified in mine closure plan it should remain live till the point of utilization. The topsoil shall temporarily be stored at earmarked site (s) only and shall not be kept unutilized. The topsoil shall be used for land reclamation and plantation purposes. Active OB dumps shall be stabilised with native grass species to prevent erosion and surface run off. The other overburden dumps shall be vegetated with native flora species. The excavated area shall be backfilled and afforested in line with the approved Mine Closure Plan. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the ministry of Environment, Forest and Climate Change/ Regional	6.573 Mm^3 Top soil has been excavated till 30.09.2021 and is being stored in the earmarked site and will be utilized as per the plantation programme. 18.066 Mm^3 OB (excl. top soil) has been excavated till 30.09.2021 and is being stacked at the earmarked dump site only. However, as per the approved mining plan & Mine closure plan, the entire de-coaled area will be converted into water body as no backfilling is proposed for excavated area of NMUG to OC mine quarry. Backfilling of adjacent mine will be done from OB of this mine. Regarding Monitoring and management of	Verified

	Office.	rehabilitated areas, it is submitted that, the same in respect of external OB dump is yet to start as the dump is active. But after vegetation / plantation, the monitoring and management will be continued till it becomes self-sustaining. Compliance against this condition is a part of Six monthly EC Compliance report which is submitted to RO, MoEF&CC regularly and will continue to be submitted.	
(vi)	The project proponent shall make necessary alternative arrangements, if grazing land is involved on core zone, in consultation with the State government to provide alternate areas for livestock grazing, if any. In this context, the project proponent shall implemented the directions of Hon'ble Supreme Court with regard to acquiring grazing land.	Not Applicable, as no separate land is acquired for grazing land.	No remark

(G) Green Belt

(i)	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered/endemic flora/fauna, if any, spotted/reported in the study area. The Action plan in this regard, if any, shall be prepared and implemented in consultation with the State Forest and Wildlife Department.	Not Applicable	No remark
(ii)	Greenbelt consisting of 3-tier plantation of width not less than 7.5 m shall be developed all along the mine lease area as soon as possible. The green belt comprising a mix of native species (endemic species should be given priority) shall be developed all	Noted and is being complied 85,000 trees planted over an area of 34 Ha over plain land between mine and adjacent villages along	No remark

	along the major approach/ coal transportation roads.	western boundary of mine and 15,000 nos. over an area of 6 Ha on Top Soil dump	

(H) Public Hearing and Human Health Issues

(i)	Adequate illumination shall be ensured in all mine locations (as per DGMS standards) and monitored weekly. The report on the same shall be submitted to this ministry & it's RO on six-monthly basis.	Noted and same is being complied	No remark
(ii)	The project proponent shall undertake occupational health survey for initial and periodical medical examination of the personnel engaged in the project and maintain records accordingly as per the provisions of the Mines Rules, 1995 and DGMS circulars. Besides regular periodic health check-up,20% of the personnel identified from workforce engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment time to time.	Complied Regular and Periodical medical examination (IME and PME) of the workers (Departmental as well as contractual workers) has been undertaken at Majri Area Hospital of WCL. Area Hospital is headed by Chief Medical Officer. Health check-up to detect for occupational diseases and hearing impairment is also being done	Verified
(iii)	Personnel (including outsourced employees) working in core zone shall wear protective respiratory devices and shall also be provided with adequate training and information on safety and health aspects.	Personnel (including outsourced employees) working in mine is provided with protective respiratory devices and adequate training and information on safety and health aspects is also provided at GVTC Majri on inducting in mining activity as well as on regular basis till they work in mines of WCL MAJRI AREA.	Verified from records
(iv)	Implementation of the action plan on the issues raised during the public hearing shall be ensured. The project proponent shall undertake all the tasks/measures as per the action plan submitted with budgetary provisions during the public hearing. Land oustees shall be compensated as per the norms laid down in the R&R policy of the company/State Government/Central	Noted and is being complied	No remark

	Government, as applicable.		
(v)	The project proponent shall follow the mitigation measures provided in this Ministry's OM No.Z-11013/5712014-IA.II (M) dated 29th October, 2014 titled 'Impact of mining activities on habitations-issues related to the mining projects wherein habitations and villages are the part of mine lease areas or habitations and villages are surrounded by the mine lease area.	Noted and is being complied	No remark

(I) Corporate Environment Responsibility

(i)	The project proponent shall comply with the provisions contained in this Ministry's OM vide F.No.22-65/2017-IA.III dated 1st May 2018, as applicable, regarding Corporate Environment Responsibility.	Noted and is being complied	No remark
(ii)	The company shall have a well laid down environmental policy duly approve by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/ deviation/ violation of the environmental/ forest/ wildlife norms/ conditions. The company shall have defined system of reporting infringements/ deviation/ violation of the environmental/ forest/ wildlife norms/ conditions and/ or shareholders/ stake holders.	Coal India Limited has its well laid down environmental policy duly approve by the CIL Board. The Environment Policy prescribes for standard operating process/ procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions. The company has a well laid down system of reporting of non-compliances/ violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.	Verified
(iii)	A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization.	Environment Cell exists at HQ, Area, & project level. GM (Environment) directly reports to the head of the Organization. GM (ENVIRONMENT) Area Nodal Officer (ENV)/ Asstt. Mgr. (Env)	Verified

		Nodal Officer (ENV)/ Asst. Mgr (C)	
(iv)	Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the Six Monthly Report.	Noted and is being complied	No remark
(v)	Self environmental audit shall be conducted annually. Every three years third party environmental audit shall be carried out.	Environmental Audit Cell has been formulated to ensure implementation of all the EC Conditions vide letter no. WCL/HQ/ENV/20-B & 25-I/71-81 dated 18.02.2017.	System exists in WCL

(J) Miscellaneous

(i)	The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the project proponent's website permanently.	Complied. Advertisement given in following 2 Newspapers :- 1) Chandrapur Samachar (Marathi) dated 06.01.2021 2) Mahavidharbha (Hindi) dated 06.01.2021	Verified
(ii)	The copies of the environmental clearance shall be submitted by the project proponent to the heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.	Copies of the environmental clearance is submitted to the heads of local bodies, Panchayats and Municipal Bodies and relevant offices of the Government between 02.01.21 to 05.01.21	Verified
(iii)	The project proponent shall upload the status of compliance of the stipulated environment clearance	Compliance of the stipulated environment clearance conditions,	Verified from website

	conditions, including result of monitored data on their website and update the same on half-yearly basis.	including result of monitored data are uploaded on WCL website regularly (http://www.westerncoal.in/?q=node/270).	
(iv)	The project proponent shall monitor the criteria, pollutants level namely; PM10, SO2, NOx (ambient levels) or critical sectoral parameters, indicated for the projects and display the same at a convenient location for disclosure to the public and put on the website of the company.	Noted and is being complied	No remark
(v)	The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the ministry of environment, Forest and Climate Change at environment clearance portal.	Six-monthly EC Compliance reports are uploaded on MoEF Website/ portal regularly	Verified
(vi)	The project proponent shall follow the mitigation measures provided in this Ministry's OM No. Z-11013/5712014-IA. II (M) dated 29th Ocober,2014, titled 'Impact of mining activities on habitations-issues related to the mining projects wherein habitations and villages are the part of mine lease areas or habitations and villages are surrounded by the mine lease area'.	Noted and is being complied	No remark
(vii)	The project proponent shall submit the environmental statement for each financial year in Form-v to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.	Environment Statement for 2020-21 has been submitted to MPCB vide UAN No. 34463 on dated 28.08.2021 as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently. Same is also been uploaded on the Company's website along with the status of compliance of EC conditions (http://www.westerncoal.in/?q=node/270).	Verified
(viii)	The project authorities shall inform to the Regional Office of the MOEFCC	Information to the Regional Office of the MOEF&CC	Verified

	regarding commencement of mining operations.	regarding commencement of mining operations has been given via e.mail dated 31.01.2021	
(ix)	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.	Noted and is being complied	No remark
(x)	The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during Public Hearing and also that during their presentation to the Expert Appraisal Committee.	Noted and is being complied	No remark
(xi)	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change.	Noted	No remark
(xii)	Concealing factual data or submission of false/ fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act,1986.	Noted	No remark
(xiii)	The ministry may revoke or suspend the clearance, if implementation of any of the above condition is not satisfactory.	Noted	No remark
(xiv)	The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.	Noted	No remark
(xv)	The regional office of this ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data/ information/ monitoring reports.	Noted	No remark
(xvi)	The above conditions shall be enforced. Inter-alia under the provisions of the water (Prevention & Control of pollution) Act,1974, the Air	Noted	No remark

	(Prevention & Control of pollution) Act, 1981, the Environment (Protection) Act,1986, Hazardous and Other Wastes (Management and Trans-boundary Movement) Rules, 2016 and the public liability insurance Act, 1991 along with their amendments and rules and any other orders passed by the Hon'ble supreme court of india/ High courts and any other court of law relating to the subject matter.		
5.	The proponent shall abide by all the commitment and recommendations made in the EIA/ EMP report and also that during presentation to the EAC. All the commitments made on the issues raised during public hearing shall also be implemented in letter and spirit.	Noted	No remark
6.	The proponent shall obtain all necessary clearances/ approvals that may be required before the start of the project. The Ministry or any other competent authority may stipulate any further condition for environmental protection. The Ministry or any other competent authority may stipulate any further condition for environmental protection.	Noted and complied	No remark
7.	Any appeal against this environmental clearance shall lie with the National Green Tribunal. If preferred, within a period of 30 days as prescribed under section 16 of the National Green Tribunal Act,2010.	Noted	No remark
8.	The coal company/ project proponent shall be liable to pay the compensation against the illegal mining, if any, and as raised by the respective State Governments at any point of time. In terms of the orders dated 2nd August, 2017 of Hon'ble Supreme Court in WP(Civil) No.114/2014 in the matter of 'Common Cause Vs Union of india & other.	Noted	No remark
9.	The concerned State Government shall ensure no mining operations to commence till the entire	Noted	No remark

	compensation for illegal mining, if any, is paid by the project proponent through their respective Department of mining & Geology, in strict compliance of the judgment of Hon'ble Supreme Court.		
10.	This environmental compliance shall not be operational till such time the project proponent complies with the above said judgment of Hon'ble Supreme Court, as applicable, and other statutory requirements.	Noted	No remark

STATUS OF RAIN WATER HARVESTING SYSTEMS

Sl. No.	Location	Type	Dimension	Area (m2)	No. of recharge pit	Depth of Bore	Dia of Bore	Depth of Recharge Pit	Dia / width of Recharge Pit
NEW MAJRI SUB AREA									
1	Rain Water harvesting Pond	Pond type	88m x 18m x 1.2m	1584 m^2	--	--	--	--	--
2	AREA HOSPITAL	Roof Top		2250 m^2	3 nos.	10 m	150 mm	1.5 m	2 m
3	VTC BUILDING	Roof Top		200 m^2	1 no.	10 m	150 mm	1.5 m	2 m
4	AUDITORIUM	Roof Top				10 m	150 mm	1.5 m	2 m
5	COAL TESTING LAB	Roof Top		150 m^2	1 no.	10 m	150 mm	1.5 m	2 m
6	FILTER PLANT	Roof Top		91 m^2		10 m	150 mm	1.5 m	2 m
7	RESCUE ROOM	Roof Top		177 m^2		10 m	150 mm	1.5 m	2 m

ROOF TOP RAIN WATER HARVESTING

COAL TESTING LAB

GM OFFICE

GM OFFICE

CENTRAL SCHOOL KUCHNA

RAIN WATER HARVESTING POND

NEW MAJRI UG TO OC MINE
POND DIMENSION : 88m x 18m x 1.20m

MAJRI RESCUE ROOM

MAJRI FILTER PLANT

Maharashtra Pollution Control Board

महाराष्ट्र प्रदूषण नियंत्रण मंडळ

Form 4

See rules 6(5),13(8),16(6) and 20(2) of Hazardous and other wastes 2016

FORM FOR FILING ANNUAL RETURNS

[To be submitted to state pollution control board/pollution control committee by 30th June of every year for the preceeding period April to march]

Unique Application Number:	***Submitted On:***	***Industry Type :***
MPCB-HW_ANNUAL_RETURN-0000039951	29-06-2023	Generator

Submitted for Year:

April 2022 to March 2023

1. Name of the generator/operator of facility	***Address of the unit/facility***
New Majri UG to OC Mine	Office of Sub Area Manager, PO: Shivjinagar, Tahsil: Bhadrawati,District: Chandrapur

1b. Authorization Number	***Date of issue***	***Date of validity of consent***
format1.0/CAC/UAN No. MPCB-CONSENT-0000160648/CR/2305000846	May 12, 2023	Mar 31, 2024

2. Name of the authorised person	***Full address of authorised person***
R.B. Verma	Office of Sub Area Manager, PO: Shivjinagar, Tahsil: Bhadrawati,District: Chandrapur

Telephone	***Fax***	***Email***
07175285086	07175285088	newmajriugtooc@gmail.com

3.Production during the year (product wise), wherever applicable

Product Type *	***Product Name ****	***Consented Quantity***	***Actual Quantity***	***UOM***
Mining	Coal	3.0000	1.864	MT/A

PART A: To be filled by hazardous waste generators

1. Total Quantity of waste generated category wise

Type of hazardous waste	***Wate Name***	***Consented Quantity***	***Quantity***	***UOM***
5.1 Used or spent oil	Used Oil	90.000	56.266	KL/Anum
5.2 Wastes or residues containing oil	Oil filter, hose pipe, oil contaminated waste	2.000	1	MTA
2.2 Sludge containing oil	ETP Sludge	9.000	4	MTA

2. Quantity dispatched category wise.

Type of Waste	***Quantity of waste***	***UOM***	***Dispatched to***	***Facility Name***
5.1 Used or spent oil	77.58	KL/Anum	Recycler or Actual user	Ranjana Group o Industries Nagpur Maharashtra
5.2 Wastes or residues containing oil	0	MTA	Disposal Facility	CHWTSDF Butibori
2.2 Sludge containing oil	0	MTA	Disposal Facility	CHWTSDF Butibori

3. Quantity Utilised in-house,If any

Type of Waste	***Name of Waste***	***Quantity of Waste***	***UOM***

	NA	0	KL/Anum

4. Quantity in storage at the end of the year

Type of Waste	***Name of Waste***	***Quantity of Waste***	***UOM***
2.2 Sludge containing oil	ETP Sludge	4	KL/Anum
5.2 Wastes or residues containing oil	Oil filter hose pipe	1	MTA

5. Quantity disposed in landfills as such and after treatment

Type	***Quantity***	***UOM***
Direct landfilling	NA	KL/Anum
Landfill after treatment	NA	KL/Anum

6. Quantity incinerated (if applicable)	***UOM***
NA	KL/Anum

PART B: To be filled bt Treatment,storage, and disposal facility operators

1.Total Quantity received	***UOM***	***State Name***
NA	KL/Anum	Maharashtra

2. Quantity in stock at the beginning of the year	***UOM***
NA	KL/Anum

3. Quantity treated	***UOM***
NA	KL/Anum

4. Quantity disposed in landfills as such and after treatment

Type	***Quantity***	***UOM***
Direct landfilling	NA	KL/Anum
Landfill after treatment	NA	KL/Anum

5. Quantity incinerated (if applicable)	***UOM***
NA	KL/Anum

6. Quantiry processed other than specified above	***UOM***
NA	KL/Anum

7. Quantity in storage at the end of the year.	***UOM***
NA	KL/Anum

PART C: To be filled by recyclers or co-processors or other users

1. Quantity of waste received during the year

Waste Name/Category	***Country Name***	***State Name***	***Quantity of waste received from domestic sources***	***Quantity of waste imported(If any)***	***Units***
NA	NULL	Other	NA	NA	KL/Anum

2. Quantity in stock at the beginning of the year

Waste Name/Category	***Quantity***	***UOM***
NA	NA	KL/Anum

3. Quantity of waste recycled or co-procesed or used

Name of Waste	***Type of Waste***	***Quantity***	***UOM***
NA	NA	NA	KL/Anum

4. Quantity of products dispatched (wherever applicable)

Name of product	***Quantity***	***UOM***

NA	NA	KL/Anum

5. Total quantity of waste generated

Waste name/category	***quantity***	***UOM***
NA	NA	KL/Anum

6. Total quantity of waste disposed

Waste name/category	***quantity***	***UOM***
NA	NA	KL/Anum

7. Total quantity of waste re-exported (If Applicable)

Waste name/category	***quantity***	***UOM***
NA	NA	KL/Anum

8. Quantity in storage at the end of the year

Waste name/category	***quantity***	***UOM***
NA	NA	KL/Anum

9. Quantity disposed in landfills as such and after treatment

Type	***Quantity***	***UOM***
Direct landfilling	NA	KL/Anum
Landfill after treatment	NA	KL/Anum

10. Quantity incinerated (if applicable)	***UOM***
NA	KL/Anum

Personal Details

Place	***Date***	***Designation***
Majri	2023-06-29	Sub Area Manager

Annexure 19

MAHARASHTRA POLLUTION CONTROL BOARD

Phone : [illegible]
Fax : [illegible]
Website: [illegible]
E-Mail: [illegible]@mpcb.gov.in

Kalpataru Point, 3rd Floor,
Sion Matunga Scheme Rd. No.8,
Opp. Sion Circle, Sion (East),
Mumbai-400 022

No: [illegible]

Date: [illegible]

URGENT/IMPORTANT

To,
M/s. [illegible]
[illegible]
[illegible] Dist. Chandrapur

Sub: Finalization of location for installation of CAAQMS [illegible] station

Ref: 1. Consent to operate granted by Board vide letter No. [illegible] dtd. [illegible]
2. Industry's proposal letter dtd. [illegible]
3. Consultation report submitted by RO Chandrapur dtd. [illegible]

With reference to your proposal letter dated [illegible] for finalization of location of installation of CAAQMS & micrometeorological station, Board's [illegible] visited the site of your industry and finalized the following location for installation of CAAQMS & micrometeorological station.

Station No.	Name of the Station	Latitude	Longitude	Environmental Setting
1	[illegible] premises	[illegible]	[illegible]	[illegible]

1. You are hereby directed to install & commission the CAAQMS & micrometeorological station [illegible]
2. [illegible]
3. Further directed to submit proposal for [illegible] within 15 days, failing to which Board will [illegible]

(Dr. [illegible])
Jt. Director (Air Pollution Control)

Copy to:
Regional Officer, MPCB, Chandrapur / Sub-Regional Officer, MPCB, Chandrapur
They are requested to follow up the matter and submit the report about completion of installation and commissioning of the station at [illegible] premises.

ENVIRONMENTAL MONITORING REPORT w.r.t. HEAVY METALS IN AMBIENT AIR

MAJRI AREA

WESTERN COALFIELDS LTD.

APRIL 2023 TO JUNE 2023

Environment Laboratory

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report Ambient Air quality monitoring data for heavy metals

TEST REPORT NO.	RIN/TR/JUNE /HM99		DATE OF ISSUE
NAME OF CUSTOMER	GM(ENV.),WCL(HQ), NAGPUR		SAMPLE DESCRIPTION
TEST REQUIRED	Heavy metals (As, Pb, Ni, Cr & Cd) in air samples (ASTM D 4185)		
NAME OF AREA	MAJRI		SAMPLING METHOD : LSOP 4
NAME OF PROJECT	NEW MAJRI UG TO OC		SAMPLING PLAN : LQR 47
No. of Pages	1		

Sl No.	Name of location	Location Code	Date of sampling
1	PATALA MAGAZINE	MMUA-1	06-04-2023
2	UG TO OC MANGER OFFICE	MMUA-2	06-04-2023
3	CONTRACTER CAMP	MMUA-3	06-04-2023
4	PRIMARY SCHOOL SAWARLI VILLAGE	MMUA-4	07-04-2023

Sl. No.	Parameter	Method of analysis	Detection limit	Observed Value			
				MMUA-1	MMUA-2	MMUA-3	MMUA-4
1	Arsenic, $\mu g/m^3$	ASTM D 4185	0.0007 $\mu g/m^3$	BDL	BDL	BDL	BDL
2	Lead, µg/m3	IS 5182 PART 22	7.0 $\mu g/m^3$	BDL	BDL	BDL	BDL
3	Nickle, $\mu g/m^3$	ASTM D 4185	0.007 $\mu g/m^3$	BDL	BDL	BDL	BDL
4	Total Chromium, $\mu g/m^3$	ASTM D 4185	0.0045 $\mu g/m^3$	BDL	BDL	BDL	BDL
5	Cadmium, $\mu g/m^3$	ASTM D 4185	0.0015 $\mu g/m^3$	BDL	BDL	BDL	BDL
6	Mercury, µg/m3	ASTM D 4185	0.0007 $\mu g/m^3$	BDL	BDL	BDL	BDL

BDL: BELOW DETECTIO

SCIENTIFIC ASSISTANT

DEEPANS
AUTHORIZED

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Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report Ambient Air quality monitoring data for heavy metals

TEST REPORT NO.	RIN/TR/JUNE /HM108		DATE OF ISSUE
NAME OF CUSTOMER	GM(ENV.),WCL(HQ), NAGPUR		SAMPLE DESCRIPTION
TEST REQUIRED	Heavy metals (As, Pb, Ni, Cr & Cd) in air samples (ASTM D 4185)		
NAME OF AREA	MAJRI		SAMPLING METHOD : LSOP 4
NAME OF PROJECT	YEKONA I & II OC		SAMPLING PLAN : LQR 47
No. of Pages	1		

Sl No.	Name of location	Location Code	Date of sampling
1	COAL STOCK YARD	MYOF-1	23-04-2023

Sl. No.	Parameter	Method of analysis	Detection limit	Observed Value
				MYOF-1
1	Arsenic, µg/m^3	ASTM D 4185	0.0007 µg/m^3	BDL
2	Lead, µg/m3	IS 5182 PART 22	7.0 µg/m^3	BDL
3	Nickle, µg/m^3	ASTM D 4185	0.007 µg/m^3	0.0077
4	Total Chromium, µg/m^3	ASTM D 4185	0.0045 µg/m^3	0.0046
5	Cadmium, µg/m^3	ASTM D 4185	0.0015 µg/m^3	BDL
6	Mercury, µg/m3	ASTM D 4185	0.0007 µg/m^3	BDL

BDL: BELOW DETECTIO

SCIENTIFIC ASSISTANT

DEEPANS
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ENVIRONMENTAL MONITORING REPORT

NEW MAJRI UG TO OC

MAJRI AREA

WESTERN COALFIELDS LTD.

JOB NO. 4094423068

APRIL 2023

Environment Laboratory
NABL Accredited vide Cert. No. TC-7102
CMPDI
REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

TEST REPORT NO.	RIN/TR/APRIL-23/50	DATE OF ISSUE	30-05-23
NAME OF CUSTOMER	GM(ENV.), WCL(HQ), NAGPUR		
TEST REQUIRED	SPM: IS 5182 Part-4:1999(RA 2019), PM-10: IS-5182 Part 23:2006(RA 2017), PM2.5: USEPA Quality Assurance guidance document volume-II (part-II)-2.12:2016, NO2: IS 5182 Part-06:2006(2017), SO2:IS 5182 Part-2:2001(RA 2017)		
SAMPLE DESCRIPTION	AIR SAMPLE	SAMPLING PLAN :	LQR 47
SAMPLING METHOD : LSOP 4	PERIOD OF PERFORMANCE OF LAB ACTIVITIES:		13-04-23 TO 15-05-23

PATALA MAGAZINE		MMOA2					
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)					ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	5	2	6	10	
06-04-23	07-04-23	230	150	58	15	12	Clear sky / Calm
21-04-23	22-04-23	234	152	62	16	11	Clear sky / Calm
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

MANAGER OFFICE UG TO OC		MMUA2					
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)					ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	5	2	6	10	
06-04-23	07-04-23	290	180	74	15	BDL	Clear sky / Calm
21-04-23	22-04-23	268	176	70	14	BDL	Clear sky / Calm
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

CONTRACTOR CAMP		MMUA3					
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)					ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	5	2	6	10	
06-04-23	07-04-23	245	149	54	18	13	Clear sky / Calm
21-04-23	22-04-23	289	173	60	16	BDL	Clear sky / Calm
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

SAWARLA VILLAGE		MMUA4					
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)					ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	5	2	6	10	
07-04-23	08-04-23	114	52	30	14	BDL	Clear sky / Calm
22-04-23	23-04-23	116	64	36	14	BDL	Clear sky / Calm
NAAQS, 2009		**-**	**100**	**60**	**80**	**80**	

Analysed by

Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

FUGITIVE DUST MONITORING

TEST REQUIRED	SPM: IS 5182 Part-4:1999(RA 2019), PM-10: IS-5182 Part 23:2006(RA 2017) & PM2.5: USEPA Quality Assurance guidance		
SAMPLE DESCRIPTION	Air sample(Fugitive)		
SAMPLING METHOD : LSOP 4	PERIOD OF PERFORMANCE OF LAB ACTIVITIES:		13-04-23 TO 15-05-23

Railway Siding		MJUF1		
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)		ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	
FROM	TO	5	5	
22-04-23	23-04-23	520	380	Clear Sky / Lightbreeze

Analysed by

Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

SAMPLE DESCRIPTION	Water sample	
Test Required	pH: IS 3025 -Part 11:1983(RA 2017),TSS: IS 3025-Part 17:1984(RA 2017),COD: APHA (23rd Edition) 5220 C :2017,O &G: IS 3025-Part 39:1991(RA 2019) & BOD: IS 3025 (Part 44): 1993 (RA 2019)	
SAMPLING METHOD	LSOP 5	PERIOD OF PERFORMANCE OF LAB ACTIVITIES : 13-04-23 TO 15-05-23

MINE WATER DISCHARGE:	MMUW1			
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS			
	pH	TSS (in mg/l)	COD(in mg/l)	O & G(in mg/l)
DETECTION LIMIT	2	10	4	2
06-04-23	7.72	20	32	BDL
21-04-23	7.54	32	20	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

ETP:	MMUW2			
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS			
	pH	TSS (in mg/l)	COD(in mg/l)	O & G(in mg/l)
DETECTION LIMIT	2	10	4	2
06-04-23	8.32	22	36	BDL
21-04-23	7.65	30	44	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

STP:	MMUW3	
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS	
	TSS (in mg/l)	BOD(in mg/l)
DETECTION LIMIT	10	2
06-04-23	32	12
21-04-23	20	10
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	100	30

Analysed by

Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

NOISE LEVEL MONITORING DATA

SAMPLE DESCRIPTION	NOISE SAMPLE
Test Required	CPCB PROCTOCOL FOR AMBIENT NOISE MEASUREMENT, JUNE-2015
SAMPLING METHOD	LSOP 6

PIT OFFICE:		MMUN1	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
APRIL'23	12-04-23	61.9	60.8
APRIL'23	28-04-23	58.8	57.4
NOISE POLLUTION (REGULATION AND CONTROL) RULES		**75**	**70**

COLONY(MAJRI UG TO OC):		MMUN2	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
APRIL'23	12-04-23	46.5	45.8
APRIL'23	28-04-23	46.8	45.9
NOISE POLLUTION (REGULATION AND CONTROL) RULES		**55**	**45**

Ashwin B Wasnik
Reviewed by

Deepanshu Sahu
Authoriesed by

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2. Laboratory activities are performed at the Laboratory permanent facility that is ground floor, Environment Lab, CMPDI RI-IV, Nagpur.
3. This report refers to the values related to the items tested.

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ENVIRONMENTAL MONITORING REPORT

NEW MAJRI UG TO OC

MAJRI AREA

WESTERN COALFIELDS LTD.

JOB NO. 4094423068

MAY 2023

Environment Laboratory

CMPDI

REGIONAL INSTITUTE-IV, KASTURBA NAGAR,
JARIPATKA, NAGPUR, PIN – 440 014

AN ISO 9001:2015 COMPANY

Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

TEST REPORT NO.	RIN/TR/MAY-23/50	DATE OF ISSUE	30-06-2023
NAME OF CUSTOMER	GM(ENV.), WCL(HQ), NAGPUR		
TEST REQUIRED	SPM: IS 5182 Part-4:1999(RA 2019), PM-10: IS-5182 Part 23:2006(RA 2017), PM2.5: USEPA Quality Assurance guidance document volume-II (part-II)-2.12:2016, NO2: IS 5182 Part-06:2006(2017), SO2:IS 5182 Part-2:2001(RA 2017)		
SAMPLE DESCRIPTION	AIR SAMPLE	SAMPLING PLAN :	LQR 47
SAMPLING METHOD : LSOP 4	PERIOD OF PERFORMANCE OF LAB ACTIVITIES:		16-05-23 TO 15-06-23

PATALA MAGAZINE		MMUA1					
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)					ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	5	2	6	10	
07-05-2023	08-05-2023	236	152	52	13	BDL	Cloudy sky /Light Breeze
21-05-2023	22-05-2023	251	159	58	14	10	Cloudy sky /Calm
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

MANAGER OFFICE UG TO OC		MMUA2					
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)					ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	5	2	6	10	
07-05-2023	08-05-2023	272	168	62	16	11	Cloudy sky /Light Breeze
21-05-2023	22-05-2023	291	210	65	18	13	Cloudy sky /Calm
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

CONTRACTOR CAMP		MMUA3					
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)					ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	5	2	6	10	
07-05-2023	08-05-2023	236	146	48	15	10	Cloudy sky /Light Breeze
21-05-2023	22-05-2023	264	172	52	16	12	Cloudy sky /Calm
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

SAWARLA VILLAGE		MMUA4					
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)					ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	5	2	6	10	
08-05-2023	09-05-2023	136	76	32	13	BDL	Cloudy sky /Light Breeze
22-05-2023	23-05-2023	120	87	36	9	BDL	Cloudy sky /Calm
NAAQS, 2009		**-**	**100**	**60**	**80**	**80**	

Analysed by

Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

SAMPLE DESCRIPTION	Water sample	
Test Required	pH: IS 3025 -Part 11:1983(RA 2017),TSS: IS 3025-Part 17:1984(RA 2017),COD: APHA (23rd Edition) 5220 C :2017,O &G: IS 3025-Part 39:1991(RA 2019) & BOD: IS 3025 (Part 44): 1993 (RA 2019)	
SAMPLING METHOD	LSOP 5	PERIOD OF PERFORMANCE OF LAB ACTIVITIES : 16-05-23 TO 15-06-23

MINE WATER DISCHARGE:	MMUW1			
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS			
	pH	TSS (in mg/l)	COD(in mg/l)	O & G(in mg/l)
DETECTION LIMIT	2	10	4	2
08-05-2023	7.84	32	52	BDL
22-05-2023	7.74	38	48	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

ETP:	MMUW2			
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS			
	pH	TSS (in mg/l)	COD(in mg/l)	O & G(in mg/l)
DETECTION LIMIT	2	10	4	2
08-05-2023	7.65	28	48	BDL
22-05-2023	8.14	40	48	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

STP:	MMUW3	
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS	
	TSS (in mg/l)	BOD(in mg/l)
DETECTION LIMIT	10	2
08-05-2023	32	10.5
22-05-2023	68	12
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	100	30

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Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

NOISE LEVEL MONITORING DATA

SAMPLE DESCRIPTION	NOISE SAMPLE
Test Required	CPCB PROCTOCOL FOR AMBIENT NOISE MEASUREMENT, JUNE-2015
SAMPLING METHOD	LSOP 6

PIT OFFICE:		MMUN1	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
MAY'23	12-05-2023	58.1	57.2
MAY'23	28-05-2023	59.5	58.4
NOISE POLLUTION (REGULATION AND CONTROL) RULES		**75**	**70**

COLONY(MAJRI UG TO OC):		MMUN2	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
MAY'23	12-05-2023	47.5	46.1
MAY'23	28-05-2023	47.3	46.1
NOISE POLLUTION (REGULATION AND CONTROL) RULES		**55**	**45**

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ENVIRONMENTAL MONITORING REPORT

NEW MAJRI UG TO OC

MAJRI AREA

WESTERN COALFIELDS LTD.

JOB NO. 4094423068

JUNE - 2023

Environment Laboratory
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Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

TEST REPORT NO.	RIN/TR/JUNE-23/50		DATE OF ISSUE	15-04-23
NAME OF CUSTOMER	GM(ENV.), WCL(HQ), NAGPUR			
TEST REQUIRED	SPM: IS 5182 Part-4:1999(RA 2019), PM-10: IS-5182 Part 23:2006(RA 2017), PM2.5: USEPA Quality Assurance guidance document volume-II (part-II)-2.12:2016, NO2: IS 5182 Part-06:2006(2017), SO2:IS 5182 Part-2:2001(RA 2017)			
SAMPLE DESCRIPTION	AIR SAMPLE		SAMPLING PLAN :	LQR 47
SAMPLING METHOD : LSOP 4	PERIOD OF PERFORMANCE OF LAB ACTIVITIES:			16-06-23 TO 15-07-23

PATALA MAGAZINE		MMUA1					
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)					ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	5	2	6	10	
01-06-23	02-06-23	274	156	52	16	10	Clear Calm
17-06-23	18-06-23	264	165	48	15	10	Clear Calm
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

MANAGER OFFICE UG TO OC		MMUA2					
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)					ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	5	2	6	10	
01-06-23	02-06-23	265	165	65	18	13	Clear Sky Calm
17-06-23	18-06-23	256	160	55	16	11	Clear Sky Calm
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

CONTRACTOR CAMP		MMUA3					
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)					ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	5	2	6	10	
01-06-23	02-06-23	278	169	43	15	BDL	Clear Calm
17-06-23	18-06-23	269	149	50	14	BDL	Clear Calm
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

SAWARLA VILLAGE		MMUA4					
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)					ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	5	2	6	10	
01-06-23	02-06-23	136	75	28	11	BDL	Clear Calm
17-06-23	18-06-23	142	82	36	12	BDL	Clear Calm
NAAQS, 2009		**-**	**100**	**60**	**80**	**80**	

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Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

SAMPLE DESCRIPTION	Water sample	
Test Required	pH: IS 3025 -Part 11:1983(RA 2017),TSS: IS 3025-Part 17:1984(RA 2017),COD: APHA (23rd Edition) 5220 C :2017,O &G: IS 3025-Part 39:1991(RA 2019) & BOD: IS 3025 (Part 44): 1993 (RA 2019)	
SAMPLING METHOD	LSOP 5	PERIOD OF PERFORMANCE OF LAB ACTIVITIES : 16-06-23 TO 15-07-23

MINE WATER DISCHARGE:	MMUW1			
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS			
	pH	TSS (in mg/l)	COD(in mg/l)	O & G(in mg/l)
DETECTION LIMIT	2	10	4	2
02-06-23	7.50	36	48	BDL
17-06-23	7.95	40	56	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

ETP:	MMUW2			
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS			
	pH	TSS (in mg/l)	COD(in mg/l)	O & G(in mg/l)
DETECTION LIMIT	2	10	4	2
02-06-23	7.65	44	52	BDL
17-06-23	7.56	36	40	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

STP:	MMUW3	
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS	
	TSS (in mg/l)	BOD(in mg/l)
DETECTION LIMIT	10	2
02-06-23	36	10.2
17-06-23	44	13.5
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	100	30

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Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

NOISE LEVEL MONITORING DATA

SAMPLE DESCRIPTION	NOISE SAMPLE
Test Required	CPCB PROCTOCOL FOR AMBIENT NOISE MEASUREMENT, JUNE-2015
SAMPLING METHOD	LSOP 6

PIT OFFICE:		MMUN1	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
JUNE'23	10-06-23	57.6	56.5
JUNE'23	26-06-23	59.3	58.1
NOISE POLLUTION (REGULATION AND CONTROL) RULES		**75**	**70**

COLONY(MAJRI UG TO OC):		MMUN2	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
JUNE'23	10-06-23	47.7	46.1
JUNE'23	26-06-23	48.7	47.5
NOISE POLLUTION (REGULATION AND CONTROL) RULES		**55**	**45**

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ENVIRONMENTAL MONITORING REPORT

NEW MAJRI UG TO OC

MAJRI AREA

WESTERN COALFIELDS LTD.

JOB NO. 4094423068

JULY - 2023

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Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

TEST REPORT NO.	RIN/TR/JULY-23/50		DATE OF ISSUE	31-08-2023
NAME OF CUSTOMER	GM(ENV.), WCL(HQ), NAGPUR			
TEST REQUIRED	SPM: IS 5182 Part-4:1999(RA 2019), PM-10: IS-5182 Part 23:2006(RA 2017), PM2.5: USEPA Quality Assurance guidance document volume-II (part-II)-2.12:2016, NO2: IS 5182 Part-06:2006(2017), SO2:IS 5182 Part-2:2001(RA 2017)			
SAMPLE DESCRIPTION	AIR SAMPLE		SAMPLING PLAN :	LQR 47
SAMPLING METHOD : LSOP 4	PERIOD OF PERFORMANCE OF LAB ACTIVITIES:			16-07-23 TO 14-08-23

PATALA MAGAZINE		MMUA1					
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)					ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	5	2	6	10	
02-07-2023	03-07-2023	266	146	50	14	10	CLEAR / CALM
17-07-2023	18-07-2023	260	154	46	17	10	CLOUDY / CALM
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

MANAGER OFFICE UG TO OC		MMUA2					
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)					ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	5	2	6	10	
02-07-2023	03-07-2023	272	160	57	16	12	CLEAR / CALM
18-07-2023	19-07-2023	266	151	63	15	11	CLOUDY / CALM
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

CONTRACTOR CAMP		MMUA3					
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)					ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	5	2	6	10	
02-07-2023	03-07-2023	270	155	45	14	BDL	CLEAR / CALM
19-07-2023	20-07-2023	262	150	53	13	BDL	CLOUDY / CALM
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

SAWARLA VILLAGE		MMUA4				
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)				ENVIRONMENT CONDITIONS (Sky/Wind)
		PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	2	6	10	
02-07-2023	03-07-2023	70	30	10	BDL	CLEAR / CALM
20-07-2023	21-07-2023	73	38	11	BDL	CLOUDY / CALM
NAAQS, 2009		**100**	**60**	**80**	**80**	

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Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

FUGITIVE DUST MONITORING

TEST REQUIRED	SPM: IS 5182 Part-4:1999(RA 2019), PM-10: IS-5182 Part 23:2006(RA 2017) & PM2.5: USEPA Quality Assurance guidance		
SAMPLE DESCRIPTION	Air sample(Fugitive)		
SAMPLING METHOD : LSOP 4	PERIOD OF PERFORMANCE OF LAB ACTIVITIES:		16-07-23 TO 14-08-23

Railway Siding	MJUF1			
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)		ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	
FROM	TO	5	5	
02-07-2023	03-07-2023	450	253	CLEAR / CALM

Analysed by

Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

SAMPLE DESCRIPTION	Water sample	
Test Required	pH: IS 3025 -Part 11:1983(RA 2017),TSS: IS 3025-Part 17:1984(RA 2017),COD: APHA (23rd Edition) 5220 C :2017,O &G: IS 3025-Part 39:1991(RA 2019) & BOD: IS 3025 (Part 44): 1993 (RA 2019)	
SAMPLING METHOD	LSOP 5	PERIOD OF PERFORMANCE OF LAB ACTIVITIES : 16-07-23 TO 14-08-23

MINE WATER DISCHARGE:	MMUW1			
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS			
	pH	TSS (in mg/l)	COD(in mg/l)	O & G(in mg/l)
DETECTION LIMIT	2	10	4	2
02-07-2023	7.46	40	52	BDL
17-07-2023	7.2	32	40	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

ETP:	MMUW2			
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS			
	pH	TSS (in mg/l)	COD(in mg/l)	O & G(in mg/l)
DETECTION LIMIT	2	10	4	2
10-07-2023	8.01	48	56	BDL
19-07-2023	7.00	36	44	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

STP:	MMUW3	
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS	
	TSS (in mg/l)	BOD(in mg/l)
DETECTION LIMIT	10	2
02-07-2023	40	15
17-07-2023	30	12.6
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	100	30

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Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

NOISE LEVEL MONITORING DATA

SAMPLE DESCRIPTION	NOISE SAMPLE
Test Required	CPCB PROCTOCOL FOR AMBIENT NOISE MEASUREMENT, JULY-2015
SAMPLING METHOD	LSOP 6

PIT OFFICE:		MMUN1	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
JULY'23	12-07-2023	58.6	57.4
JULY'23	20-07-2023	54.6	52.7
NOISE POLLUTION (REGULATION AND CONTROL) RULES		**75**	**70**

COLONY(MAJRI UG TO OC):		MMUN2	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
JULY'23	12-07-2023	46.3	45.1
JULY'23	20-07-2023	43.2	42.2
NOISE POLLUTION (REGULATION AND CONTROL) RULES		**55**	**45**

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ENVIRONMENTAL MONITORING REPORT

NEW MAJRI UG TO OC

MAJRI AREA

WESTERN COALFIELDS LTD.

JOB NO. 4094423068

AUGUST - 2023

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Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report

TEST REPORT NO.	RIN/TR/AUG-23/50	DATE OF ISSUE	30-09-2023
NAME OF CUSTOMER	GM(ENV.), WCL(HQ), NAGPUR		
TEST REQUIRED	SPM: IS 5182 Part-4:1999(RA 2019), PM-10: IS-5182 Part 23:2006(RA 2017), PM2.5: USEPA Quality Assurance guidance document volume-II (part-II)-2.12:2016, NO2: IS 5182 Part-06:2006(2017), SO2:IS 5182 Part-2:2001(RA 2017)		
SAMPLE DESCRIPTION	AIR SAMPLE	SAMPLING PLAN :	LQR 47
SAMPLING METHOD : LSOP 4	PERIOD OF PERFORMANCE OF LAB ACTIVITIES:		15-08-23 TO 15-09-23

PATALA MAGAZINE		MMUA1					
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)					ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	5	2	6	10	
01-08-2023	02-08-2023	240	128	42	12	10	RAINY / CALM
17-08-2023	18-08-2023	230	131	40	14	10	CLOUDY / CALM
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

MANAGER OFFICE UG TO OC		MMUA2					
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)					ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	5	2	6	10	
01-08-2023	02-08-2023	266	142	50	14	12	RAINY / CALM
17-08-2023	18-08-2023	258	150	60	13	10	CLOUDY / CALM
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

CONTRACTOR CAMP		MMUA3					
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)					ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	5	2	6	10	
01-08-2023	02-08-2023	260	144	43	14	BDL	RAINY / CALM
17-08-2023	18-08-2023	251	140	42	12	BDL	CLOUDY / CALM
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

SAWARLA VILLAGE		MMUA4				
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)				ENVIRONMENT CONDITIONS (Sky/Wind)
		PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	2	6	10	
01-08-2023	02-08-2023	60	28	8	BDL	RAINY / CALM
17-08-2023	18-08-2023	67	30	10	BDL	CLOUDY / CALM
NAAQS, 2009		**100**	**60**	**80**	**80**	

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Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

SAMPLE DESCRIPTION	Water sample	
Test Required	pH: IS 3025 -Part 11:1983(RA 2017),TSS: IS 3025-Part 17:1984(RA 2017),COD: APHA (23rd Edition) 5220 C :2017,O &G: IS 3025-Part 39:1991(RA 2019) & BOD: IS 3025 (Part 44): 1993 (RA 2019)	
SAMPLING METHOD	LSOP 5	PERIOD OF PERFORMANCE OF LAB ACTIVITIES : 15-08-23 TO 15-09-23

MINE WATER DISCHARGE:	MMUW1			
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS			
	pH	TSS (in mg/l)	COD(in mg/l)	O & G(in mg/l)
DETECTION LIMIT	2	10	4	2
02-08-2023	7.08	48	60	BDL
18-08-2023	7.28	32	44	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

ETP:	MMUW2			
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS			
	pH	TSS (in mg/l)	COD(in mg/l)	O & G(in mg/l)
DETECTION LIMIT	2	10	4	2
02-08-2023	6.86	36	44	BDL
18-08-2023	7.08	30	28	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

STP:	MMUW3	
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS	
	TSS (in mg/l)	BOD(in mg/l)
DETECTION LIMIT	10	2
02-08-2023	30	13.2
18-08-2023	36	14.4
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	100	30

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Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

NOISE LEVEL MONITORING DATA

SAMPLE DESCRIPTION	NOISE SAMPLE
Test Required	CPCB PROCTOCOL FOR AMBIENT NOISE MEASUREMENT, AUG-2015
SAMPLING METHOD	LSOP 6

PIT OFFICE:		MMUN1	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
AUG'23	08-08-2023	55.6	53.6
AUG'23	23-08-2023	56.0	55.2
NOISE POLLUTION (REGULATION AND CONTROL) RULES		**75**	**70**

COLONY(MAJRI UG TO OC):		MMUN2	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
AUG'23	08-08-2023	42.3	40.2
AUG'23	23-08-2023	43.8	42.5
NOISE POLLUTION (REGULATION AND CONTROL) RULES		**55**	**45**

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ENVIRONMENTAL MONITORING REPORT

NEW MAJRI UG TO OC

MAJRI AREA

WESTERN COALFIELDS LTD.

JOB NO. 4094423068

SEPTEMBER - 2023

Environment Laboratory
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JARIPATKA, NAGPUR, PIN – 440 014

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Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

TEST REPORT NO.	RIN/TR/SEPT-23/50		DATE OF ISSUE	27-10-23
NAME OF CUSTOMER	GM(ENV.), WCL(HQ), NAGPUR			
TEST REQUIRED	SPM: IS 5182 Part-4:1999(RA 2019), PM-10: IS-5182 Part 23:2006(RA 2017), PM2.5: USEPA Quality Assurance guidance document volume-II (part-II)-2.12:2016, NO2: IS 5182 Part-06:2006(2017), SO2:IS 5182 Part-2:2001(RA 2017)			
SAMPLE DESCRIPTION	AIR SAMPLE		SAMPLING PLAN :	LQR 47
SAMPLING METHOD : LSOP 4	PERIOD OF PERFORMANCE OF LAB ACTIVITIES:			15-09-23 TO 15-10-23

PATALA MAGAZINE		MMUA1					
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)					ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	5	2	6	10	
02-09-23	03-09-23	255	138	46	14	12	cloudy/ calm
17-09-23	18-09-23	270	145	50	15	11	clear/Moderate breeze
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

MANAGER OFFICE UG TO OC		MMUA2					
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)					ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	5	2	6	10	
02-09-23	03-09-23	276	150	58	16	14	cloudy/ calm
17-09-23	18-09-23	260	140	62	14	10	clear/Moderate breeze
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

CONTRACTOR CAMP		MMUA3					
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)					ENVIRONMENT CONDITIONS (Sky/Wind)
		SPM	PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	5	2	6	10	
02-09-23	03-09-23	270	160	50	14	10	cloudy/ calm
17-09-23	18-09-23	250	132	40	10	BDL	clear/Moderate breeze
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

SAWARLA VILLAGE		MMUA4				
DATE(dd:mm:yy) OF SAMPLING		PARAMETERS (24 hourly values in µg/m^3)				ENVIRONMENT CONDITIONS (Sky/Wind)
		PM_{10}	$PM_{2.5}$	No_2	So_2	
FROM	TO	5	2	6	10	
02-09-23	03-09-23	58	34	12	10	cloudy/ calm
17-09-23	18-09-23	65	36	12	BDL	clear/Moderate breeze
NAAQS, 2009		**100**	**60**	**80**	**80**	

Analysed by

Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

SAMPLE DESCRIPTION	Water sample	
Test Required	pH: IS 3025 -Part 11:1983(RA 2017),TSS: IS 3025-Part 17:1984(RA 2017),COD: APHA (23rd Edition) 5220 C :2017,O &G: IS 3025-Part 39:1991(RA 2019) & BOD: IS 3025 (Part 44): 1993 (RA 2019)	
SAMPLING METHOD	LSOP 5	PERIOD OF PERFORMANCE OF LAB ACTIVITIES : 15-09-23 TO 15-10-23

MINE WATER DISCHARGE:	MMUW1			
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS			
	pH	TSS (in mg/l)	COD(in mg/l)	O & G(in mg/l)
DETECTION LIMIT	2	10	4	2
02-09-23	7.06	52	48	BDL
18-09-23	7.63	40	36	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

ETP:	MMUW2			
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS			
	pH	TSS (in mg/l)	COD(in mg/l)	O & G(in mg/l)
DETECTION LIMIT	2	10	4	2
02-09-23	7.40	42	52	BDL
17-09-23	8.30	36	40	BDL;
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

STP:	MMUW3	
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS	
	TSS (in mg/l)	BOD(in mg/l)
DETECTION LIMIT	10	2
02-09-23	40	14.4
17-09-23	34	12
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	100	30

Analysed by

Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

NOISE LEVEL MONITORING DATA

SAMPLE DESCRIPTION	NOISE SAMPLE
Test Required	CPCB PROCTOCOL FOR AMBIENT NOISE MEASUREMENT, AUG-2015
SAMPLING METHOD	LSOP 6

PIT OFFICE:		MMUN1	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
SEPT'23	08-09-23	54.2	53.5
SEPT'23	24-09-23	55.0	54.6
NOISE POLLUTION (REGULATION AND CONTROL) RULES		**75**	**70**

COLONY(MAJRI UG TO OC):		MMUN2	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
SEPT'23	08-09-23	44.3	43.2
SEPT'23	24-09-23	44.7	43.3
NOISE POLLUTION (REGULATION AND CONTROL) RULES		**55**	**45**

Ashwin B Wasnik
Reviewed by

Deepanshu Sahu
Authoriesed by

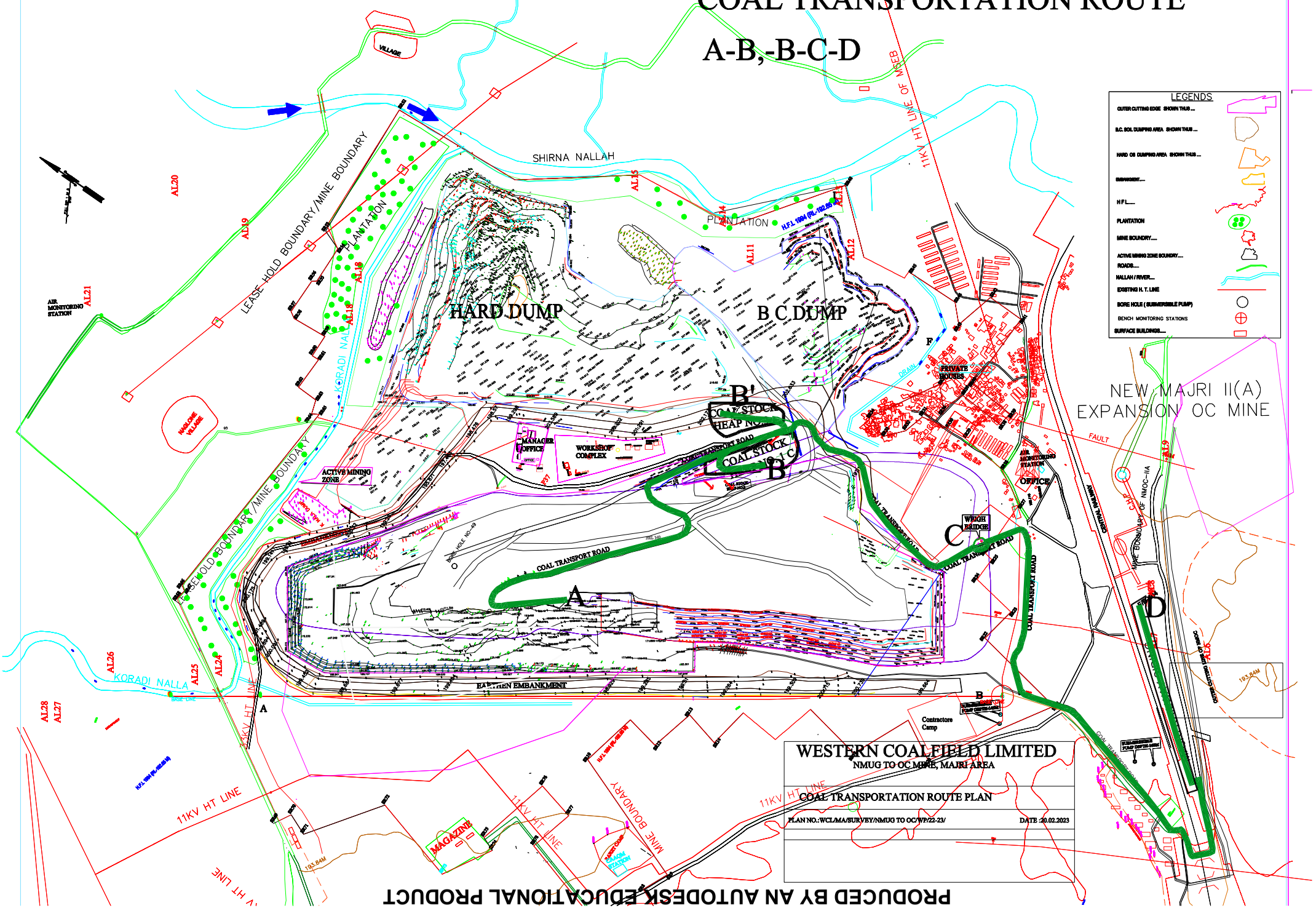
1. This report cannot be reproduced in part or full without written of the management.
2. Laboratory activities are performed at the Laboratory permanent facility that is ground floor, Environment Lab, CMPDI RI-IV, Nagpur.
3. This report refers to the values related to the items tested.

********** End of report **********

Annexure 22

COAL TRANSPORTATION ROUTE

A-B,-B-C-D



Annexure 23

PUC Certification

PUC Certification

PUC Certification

ENVIRONMENT RECORD UPLOADED ON COMPANY's WEBSITE

http://www.westerncoal.in/index1.php

भारत सरकार/Govt. of India

Western Coalfields Limited

(Nagpur) (A Miniratna Company)

(A Subsidiary of Coal India Limited)

पर्यावरण विभाग

Environment Department

क्षेत्र महाप्रबंधक कार्यालय, मोहर क्षेत्र

Office of the Area General Manager, Mohri Area

Post Kuchina Bk Bhadewadi, Dist. Chandrapur - 442503

संदर्भ संख्या/ Ref. No. वेकोलि/मोहरी क्षेत्र/पर्यावरण/2023/233

दिनांक/ Date : 18.11.2023

प्रति,

सचिव निदेशक,

केन्द्रीय भूमि जल बोर्ड (CGWB),

मध्य प्रेक्षिकाएं, नए प्रतिबंधित विभाग,

डी. विंग, जल संसाधन, विंग भवन, नागपुर-440001

विषय : Ground Water Level Monitoring Report for the period December 2022 to August 2023 for the mines of Mohri Area, WCL located in Maharashtra State - regarding

महोदय,

In compliance of conditions stipulated in Environment Clearance of coal mines of Mohri Area, WCL, ground water level (GWL) in villages falling in Buffer zone of respective mines of Mohri Area located in the state of Maharashtra is monitored through M/s Anacon lab & a copy of the report for the period December 2022 to August 2023 of the mines of Mohri Area, WCL is enclosed herewith for your kind information & ready reference.

धन्यवाद,

भवदीय

18/11/2023

संजीव केशरवाणी (पर्यावरण),

मोहरी क्षेत्र

संलग्नक : यथोपरि

प्रतिलिपि :

- GZ&c - DA II (केंद्रीय प्रदूषण नियंत्रण बोर्ड, जल अध्ययन, पर्यावरण, वन एवं जलवायु मंत्रालय, इंदिरा पर्यावरण भवन, जोड़ सिंह, सीबीडी एरिया, अरेरा कॉलोनी, भोपाल 110 003
- सदस्य सचिव, केन्द्रीय भूजल प्राधिकरण (CGWA), बेसमेंट विंग -2, सिंचाई, केंद्रीय-II, आर के पुरम, नई दिल्ली - 110066
- सदस्य सचिव, केन्द्रीय प्रदूषण नियंत्रण बोर्ड (CPCB), परिवेश भवन, इंद्रप्रस्थ एस्टेट, मंडावली, दिल्ली - 110092...with copy of report
- Addl. Principal Chief Conservator of Forests, वनविभाग, मध्य प्रदेश जलवायु परिवर्तन संस्थान, क्षेत्रीय कार्यालय (WCZ), रामदेव पार्क, इंदर पिर, नए प्रतिबंधित विभाग, विंग भवन, नागपुर 440001, (महाराष्ट्र)...with copy of report
- कार्यपालक अभियंता, महाराष्ट्र प्रदूषण नियंत्रण बोर्ड, जल भवन, प्रदूषण भवन, रामदेव पेठ, चंद्रपुर - 442 401
- प्रबंधक महाप्रबंधक, मोहरी क्षेत्र
- महाप्रबंधक (पर्यावरण), वि० को० लि० मुख्यालय, नागपुर

Nomenclature general letter (2)

REPORT ON

MONITORING OF GROUND WATER LEVEL

OF

EXPANSION OF NEW MAJRI UG TO OC MINE

MAJRI AREA

(M.S)

WESTERN COALFIELDS LTD.

PERIOD- DEC 2022 (POST-MONSOON), JAN-FEB -2023 (WINTER) , MAY-2023 (PRE-MONSOON) & AUG-23 (MONSOON)

M/s Anacon Laboratories Pvt. Ltd., Nagpur

MoEF&CC (GOI) and NABL Recognized Laboratory
ISO 9001:2015, ISO 14001:2015, ISO 45001:2018
Lab. & Consultancy: FP-34, 35, Food Park,
MIDC, Butibori, Nagpur – 441122
Mob: +91-9372960077
Email: ***ngp@anacon.in***
Website: ***www.anaconlaboratories.com***

Report No. ANqr /PD/20A/2023/199

2022-23 & 2023-24

The Ground water Level monitoring & Water Quality Analysis has been carried out with due diligence and the Monitoring of Ground Water Level of all observation wells Report have been prepared as per the scope of work order no. वेकोलि/मुख्यालय/पर्यावरण/14-L/77 on date: 08.12.2022.

The report encompasses the Monitoring of Ground water level & Water Quality Analysis reports of observation wells pertaining to the EXPANSION OF NEW MAJRI UG TO OC MINE, of the Majri area, Chandrapur District, Maharashtra State.

Anacon Laboratories Pvt. Ltd. gratefully acknowledges the full cooperation rendered by concerned WCL Officials for timely completion of the project.

Ajinkya Nakod
(Geologist)

Gyanchand Bohra
NABET Accredited EIA Expert
for Hydrogeology & Geology

Nagpur.
September-October-2023

(Dr. D. G. Garway)
Head of Organization
Anacon Laboratories Pvt. Ltd., Nagpur

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I-TABLE	EXPANSION OF NEW MAJRI UG TO OC MINE,	PERIOD- DEC 2022 (POST-MONSOON), JAN-FEB -2023 (WINTER) , MAY-2023 (PRE-MONSOON) & AUG-23 (MONSOON)	8
III	EXPANSION OF NEW MAJRI UG TO OC MINE,	ANALYSIS REPORT	11

INTRODUCTION

WCL is one of the eight Subsidiary Companies of Coal India Limited (CIL) which is under administrative control of Ministry of Coal. The Company incorporated under the Companies Act, 1956 has its registered office at Coal Estate, Civil Lines, Nagpur–440001. WCL has been conferred "Mini-ratna" status on 15 March 2008. It has mining operation spread over the states of Maharashtra (in Nagpur, Chandrapur & Yeotmal Districts) and Madhya Pradesh (in Betul and Chhindawara Districts). It has been divided into 10 administrative areas. The Company is a major source of supplies of coal to the industries located in Western India in the States of Maharashtra, Madhya Pradesh, Gujarat and also in Southern India in the States of Andhra Pradesh, Tamil Nadu, Karnataka and Kerala. A large numbers of Power Houses under Maharashtra, Madhya Pradesh, Gujarat, Karnataka, Punjab and Uttar Pradesh - Electricity Boards are major consumers of its coal along with cement, steel, chemical, fertilizer, paper and brick Industries in these states.

M/s Anacon Laboratories Pvt. Ltd. has been awarded the Work of "Groundwater level Monitoring (i.e. bore well / piezometer Water levels) and Water quality analysis (as per IS10500) for 76 projects / mines of WCL (situated in the state of Madhya Pradesh – Chhindwara & Betul districts and Maharashtra – Nagpur, Chandrapur & Yeotmal districts) for one year as per condition stipulated in Environmental Clearance letters issued by MoEF & CC & NOC issued by CGWA" vide work order वेकोलि/मुख्यालय/पर्यावरण/14-L/77 on date: 08.12.2022.

This Ground Water Level Monitoring report is prepared for EXPANSION OF NEW MAJRI UG TO OC MINE, of Majri Area of WCL for 4 seasons i.e PERIOD- DEC 2022 (POST-MONSOON), JAN-FEB - 2023 (WINTER) , MAY-2023 (PRE-MONSOON) & AUG-23 (MONSOON) . These mines are located in Chandrapur District of Maharashtra

GENERAL HYDROGEOLOGICAL CONDITION

The major water bearing formations in the district are Alluvium, Lower Gondwana Sandstones, Deccan Trap Basalt, Vindhyan Limestone and Archean metamorphic. Amongst these, the lower Gondwana Sandstones, particularly Kamthi Sandstone forms the most potential aquifer.

A. HARD ROCK FORMATIONS

ARCHEAN METAMORPHICS

Archeans, which comprise granite and granitic gneiss, occur in most of the eastern part of the district extending north-south from Nagbhid to Gondpipri. 6 These rocks are generally devoid of primary porosity, but weathering, jointing, fracturing, shearing etc., create secondary porosity, within which the ground water generally occurs in phreatic conditions. The depth of weathering ranges from 4 to 12 m bgl and dugwells are generally tapping this zone with yields of up to 30 m3 /day. Contrary to the general perception, the possibility of deep seated fracture zone exists in the area because of tectonic disturbances manifested in the form of dykes observed in the area. Therefore borewells in the depth range of 40-70 m bgl are also successful in this formation at suitable places with yield of 1000 to 35000 lph. High yielding dugwells are generally located in fractured granites.

VINDHYAN LIMESTONE

In Vindhyans, Limestones are water bearing formation while Sandstone due to their hard and compact nature, has poor ground water potential. The Vindhyan sedimentares mainly occur in

north central part of the district around Tadoba and Nagbhid in parts of Chimur, Sindewahi, Bhadravati and Nagbhid talukas and in south eastern part of the district in parts of Chandur and Rajura talukas. Limestones as such are massive but wherever they are cavernous and fractured they are capable of holding water and the ground water generally occurs under phreatic condition in these formations and the discharge in general is poor (up to 15 m3 /day). The borewells drilled by State Govt. agencies in the depth range of 30 to 40 m bgl are successful only at few places where discharge of 10000 lph or above has been observed.

DECCAN TRAP BASALT

Deccan Trap Basalt is observed in small area in the north eastern and south eastern peripheral parts of the district and does not form a promising aquifer in the district. Weathered, jointed and fractured Massive and Vesicular Basalt forms the aquifer in the area. Ground water occurs in phreatic conditions within the depth of 10-15 m, however, borewells drilled have shown presence of fracture zones and thus forming deeper confined and semi-confined aquifers at places. The dugwells yield varies from 15-30 m3 /day when favourably located, whereas borewells yield 1 to 3 lps.

B. <u>SOFT ROCK FORMATIONS</u>

GONDWANA SANDSTONE

Gondwana formation comprising of Kamthi and Barakar Sandstone and Maleri and Talchir Shale occupy north-south extending elongated stretch in cental and southern parts of the district in parts of Warora, Bhadravati, Chandrapur, Ballarpur, Rajura and Gondpipri talukas. Sandstone is usually friable and possesses primary porosity due to its granular nature. They are most productive water bearing formations in the district. The ground water occurs under phreatic as well as confined conditions in Kamthi Sandstone up to the depth of 80 to 120 m bgl with thickness varying from 34 to 102 m. Barakar Sandstone occurs below Kamthi formation and three granular zones are observed with cumulative thickness of about 72 m within a 300 m thick sandstone-shale sequence. Comparatively Kamthi Sandstone has more ground water potential with yields of up to 20 lps. The other Gondwana formations i.e., Maleri Series (upper Gondwana) and Talchirs (lower Gondwana) have very poor ground water potential and ground water occurs in phreatic condition.

ALLUVIUM

Alluvium of fluvial origin occurs in narrow patches along the banks of Wardha and Wainganga Rivers and consists of clay, silt with lenticular bodies of sand and gravel. Ground water generally occurs under phreatic conditions down to the depth of 10-15 m. The area in the north eastern part of the district near Brahmapuri along the western bank of Wainganga River and having a spread of about 100 sq. km. forms the most potential alluvial area. The Allluvium in this part is occurs down to 30-35 m and the basement is reported to be formed by Granitic Gneisses. The dugwells yield up to 50 m3 /day when favourably located, whereas shallow tubewells yield varies from 5 to 15 lps.

EXPANSION OF NEW MAJRI UG TO OC MINE,

MAJRI AREA

WESTERN COALFIELDS LTD.

PERIOD- DEC 2022 (POST-MONSOON), JAN-FEB -2023 (WINTER) , MAY-2023 (PRE-MONSOON) & AUG-23 (MONSOON)

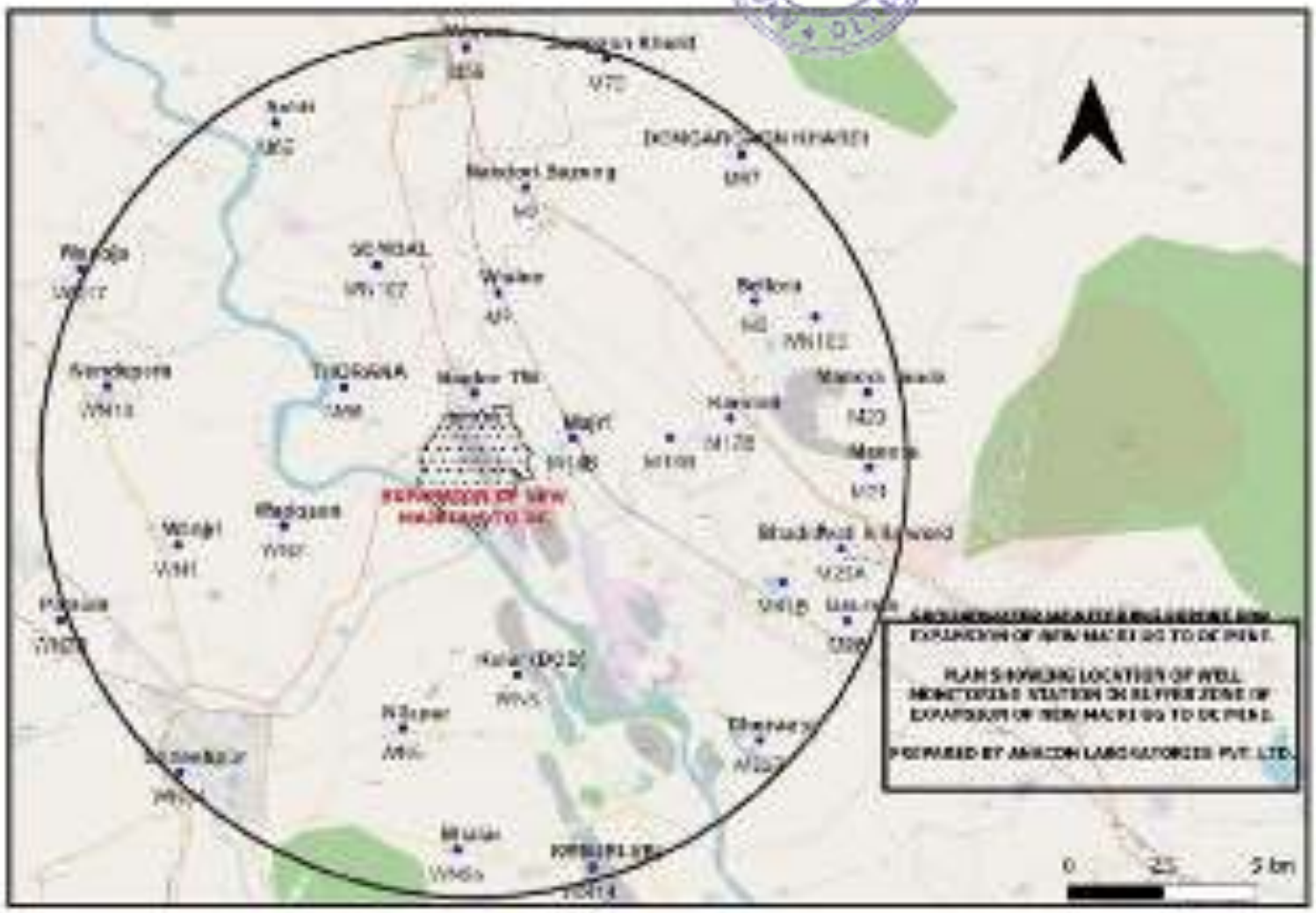

FIGURE-I: GROUND WATER MONITORING STATION (OBSERVATION WELLS IN AND AROUND OF EXPANSION OF NEW MAJRI UG TO OC MINE)

Table: I Ground Water Level Monitoring Data of Dugwells/Piezometers in Buffer Zone of Expansion of New Majri UG to OC mine, Majri area, WCL

Sr. No.	Well No.	Name of village	Well location	Latitude	Longitude	R.L. in m	Well dia (m)	Well depth (m bmp)	Height of measuring point (m agl)	Depth to Water Level (m bgl)				Utility / Owner	Formation Tapped
										DEC -22	JAN-FEB-23	MAY -23	Aug-23		
1	M2	Nandori Buzung	W of Nagpur - Chandrapur road near old Toll Tax naka	20°12'2.339092641 29437"	79°1'54.082513205 3294"	196	2.24	9.11	0.63	1.1	3.4	4.2	2.90	IRRIGATION	SHELLY LIMESTONE
2	M5	Bellora	W edge of village, adjacent to Jena road near to temple	20°10'18.34841628 96335"	79°5'23.199858345 8051"	215	3.36	9.2	0.69	2	4.6	6.3	3.10	DOMESTIC	BASALT
3	M7	Wislon	200 m N of village in the field, adjacent to Nandori road, near to school.	20°10'25.70946270 78914"	79°1'29.045613494 6305"	215	2.21	6.36	0.65	2.3	3.8	4.4	2.80	DOMESTIC	SHELLY LIMESTONE
4	M10	Naglon TW	C of village near well No. 10 in the compound of owner house	20°8'53.274854325 2183"	79°1'7.014943938 9315"	198	1.82	15	0.55	4.3	6.5	7.1	3.00	IRRIGATION	BASALT
5	M10 A	Naglon/Kuchna colony	In field near Kuchna colony	20°8'53.27"	79°1'7.01"	198	1.82	8.7	0.55	1.9	1.2	3.4	1.90	DOMESTIC	SHELLY LIMESTONE
6	M14B	Majri	SE of village , near GP office adjacent road	20°8'12.458211791 1999"	79°2'36.690441286 8496"	217	3.11	6.95	0.3	2.1	3.6	5.5	3.20	IRRIGATION	SHELLY LIMESTONE

Sr. No.	Well No.	Name of village	Well location	Latitude	Longitude	R.L. in m	Well dia (m)	Well depth (m bmp)	Height of measuring point (m agl)	Depth to Water Level (m bgl)				Utility / Owner	Formation Tapped
										DEC -22	JAN-FEB-23	MAY -23	Aug-23		
7	M16B	Kondha (New)	E of village, N of main road	20°8'12.821560836 0037"	79°4'5.88838707195 464"	219	3.32	10.49	0.64	2.25	6.3	7.3	3.00	IRRIGATION	SHELLY LIMESTONE
8	M17B	Kandoli	N of village, near Hanuman Mandir	20°8'30.857006674 367"	79°5'0.815059913458088"	212	2.56	11.68	0.54	3.65	5	6.8	2.80	IRRIGATION	BASALT
9	M20	Manora Tanda	S of village, adjacent to Mangoli road, near school.	20°8'54.48"	79°7'5.97"	212	2.35	7.35	0.33	1.7	4	6.2	1.85	IRRIGATION	SHELLY LIMESTONE
10	M21	Manora	W of village, 60 m S of Mangli road	20°7'46.211229863 4764"	79°7'7.847903256 61105"	212	2.35	7.35	0.33	2.35	4.4	6.0	2.60	DOMESTIC	BASALT
11	M23	Bhadravati Camp (GSI Drilling camp)	N of village (outside) , about 70 m E of Kesurli road after G.S.I drilling camp	20°6'48.679351228 8855"	79°6'24.298763752 1275"	221	2.68	12.25	0.82	3.6	4	5.3	4.50	DOMESTIC	SHELLY LIMESTONE
12	M23 A	Bhadravati killa word	Vivekanand Madhyamik vidhalaya	20°6'31.391431200 7597"	79°6'42.027578124 6596"	224	2.49	17.74	0.54	5.6	8.2	10.1	3.80	IRRIGATION	SHELLY LIMESTONE
13	M26	Gaurala	C of village, near OHT	20°5'25.727103641 6739"	79°6'47.631536267 0925"	202	2.59	8.81	0.51	3.2	2.6	4.5	1.90	IRRIGATION	BASALT

Sr. No.	Well No.	Name of village	Well location	Latitude	Longitude	R.L. in m	Well dia (m)	Well depth (m bmp)	Height of measuring point (m agl)	Depth to Water Level (m bgl)				Utility / Owner	Formation Tapped
										DEC -22	JAN-FEB-23	MAY -23	Aug-23		
17	M32B	Dhorwasa	W of village, adjacent to road & near to embankment	20°3'36"	79°5'28"	204	2.62	9.54	0.54	1.6	3	4.9	3.30	IRRIGATION	BASALT
18	M41B	Vijasan	Near ZP school of Balwadi	20°6'0.9012838237 39618"	79°5'48.961627147 4631"	213	2.74	12.59	0.82	3.1	2.8	5.7	4.50	DOMESTIC	SHELLY LIMESTONE
31	M59	Warora	Anandvan Bio-Technology Lab, Adjacent to Nagpur-Chandrapur road	20°14'10.34333058 58061"	79°0'59.328874806 6641"	212	4.12	11.21	0.3	3.8	6.3	9.0	2.70	DOMESTIC	BASALT
33	M62	Ashti	East of the village , opp. to Mahadev Upre's house	20°13'1.197008621 73318"	78°58'5.078847260 25165"	214	4	10.11	0.45	4.3	5.1	8.3	1.90	DOMESTIC	BASALT
39	M66	THORANA	IN THE AGRICCULTURE FIELD OUTSIDE THE VILLAGE ON NORTH SIDE OF THE VILLAGE	20°8'59.19"	78°59'7.63"	200	4.2	11	0.5	4.1	8.3	9.4	1.50	DOMESTIC	BASALT
40	M67	DONGARGAON KHARDI	NEAR HANUMAN MANDIR ADJACENT TO THE ROAD	20°12'32.56"	79°5'11.223"	210	5.2	13.5	0.5	4.3	6.1	8.3	3.40	IRRIGATION	SHELLY LIMESTONE

Sr. No.	Well No.	Name of village	Well location	Latitude	Longitude	R.L. in m	Well dia (m)	Well depth (m bmp)	Height of measuring point (m agl)	Depth to Water Level (m bgl)				Utility / Owner	Formation Tapped
										DEC -22	JAN-FEB-23	MAY -23	Aug-23		
43	M70	Jamgaon Khurd	NEAR SOUTH TO KHIRATKAR NIVAS	20°14'0.2"	79°3'7.64"	205	3.8	10.3	0.45	3.2	4.5	5.7	2.95	DOMESTIC	BASALT
1	WN6	Nilapur	About 800 m W of village, adjacent to Wani road	20°3'47.197682958 5572"	79°0'1.44 63598697 6027"	197	4.95	9.2	0.34	2.1	3.5	4.2	1.60	D/I	
2	WN8 a	Bhalar	Near bus stop. Well of Sri. Arun Maruti Goble	20°1'56"	79°0'51"	215	1.55	8.6	0.73	2.6	4.2	6.7	2.30	D/I	
4	WN1 4	KESURLI(B)	TW near Kesurli More on E of Wani road	20°1'40"	79°2'55.2"	210	4	9.3	0.5	2.9	4.55	6.2	1.90	D/I	
24	WN2	Wadgaon	About 400 m S of village, adjacent to nalla	20°6'52.3 28744489 5587"	78°58'12. 97027921 06241"	224	4.75	7.01	0.85	1.4	4.1	5.5	1.70	D/I	
25	WN5	Kolar (DCB)	E of village, adjacent to nalla well of Nilkant Pijurkar	20°4'36.1 26217532 636"	79°1'46.4 54012685 0829"	211	1.82	10.52	0.15	3.4	5.5	7.2	2.00	D/I	
26	WN5 4	Ganeshpur	TW near the road junction of Wegaon & Ghonsa	20°3'6.59 19199074 7701"	78°56'38. 17778677 60342"	214	1.58	7.04	GL	2	2.6	4.4	1.80	D/I	
27	WN1	Wanjri	C of village in southern sector,	20°6'34.8 98433431 4579"	78°56'35. 97092298 12744"	210	2.74	7.16	0.88	2.2	3.55	6.2	3.10	D/I	

Sr. No.	Well No.	Name of village	Well location	Latitude	Longitude	R.L. in m	Well dia (m)	Well depth (m bmp)	Height of measuring point (m agl)	Depth to Water Level (m bgl)				Utility / Owner	Formation Tapped
										DEC -22	JAN-FEB-23	MAY -23	Aug-23		
			about 60 m E of main road												
28	WN16	Nandepera	Near Hanuman Temple and GP office	20°9'0.2843023828 3903"	78°55'31.3168384091342"	220	4.23	8.05	0.7	3.1	4.05	7.2	2.70	D/I	
29	WN17	Wanoja	60m E of road entering in villageand N of Nallah	20°10'47.7104582490867"	78°55'6.834644057 43179"	225	4.6	9.3	0.4	4.2	6.5	7.9	1.95	D/I	
35	WN28	Palsula	15m N of Wani Yavatmal Rd near Soyabin Gowdown	20°5'25.844391527 2409"	78°54'48.5673870674054"	195	5	13.5	0.3	3.1	7.45	6.3	2.60	D/I	
53	WN106	GOVARDIPRITH	OPPOSITE TO THE Z P SCHOOL JENA	20°10'3.74"	79°6'18.56"	210	5.2	15.6	0.3	5.4	8.8	9.9	4.40	D/I	
54	WN107	SEMBAL	NORTH -WEST FROM JAGANNATH BABA TEMPLE ABOUT 200M	20°10'51.41"	78°59'37.2"	215	4.2	8.7	0.3	3.6	4.2	7.0	3.80	D/I	

NOTE- GP-Gram Panchayat, BMP-Below Measuring Point, agl- Above Ground Level, D-Domestic, I-Irrigation, P-Private, RL- reduced Level, bgl- Below Ground level, NA- Not Accessible

ANALYSIS REPORT

Anacon Laboratories

TC 5458

Test Report

UID No.: [illegible]
Test Report No.: [illegible]

Issued To: Mr. [illegible]	Sample Received No.: [illegible] Received Date: [illegible] Reference: -	Analysis Start: [illegible] Analysis End: [illegible] Sample Category: Water

Sample Name	Sample Description	Purpose of Analysis	Quantity Received
[illegible]	Drinking Water [illegible]	Drinking	[illegible]

Sample Collected By	Sampling Date / Sampling Time	Sampling Location
Mr. [illegible]	[illegible] / No Mention	Nagpur District

Tests Requested: Chemical Testing

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 1		Test Result
				Acceptable Limit	Permissible Limit	
	Chemical Testing 1. Water					
1	pH [illegible]	-	IS [illegible]	[illegible]	[illegible]	[illegible]
2	Odour	Unit	IS [illegible]	5	15	[illegible]
3	Total [illegible]	mg/l	IS [illegible]	250	1000	[illegible]
4	Calcium as Ca	mg/l	IS [illegible]	75	200	[illegible]
5	Residual Chlorine	mg/l	IS [illegible]	0.2	1	[illegible]
6	Fluoride (as F)	mg/l	IS [illegible]	1.0	1.5	[illegible]
7	Magnesium (as Mg)	mg/l	IS [illegible]	30	100	[illegible]
8	Nitrate (as NO3)	mg/l	APHA method [illegible]	45	No relaxation	[illegible]
9	Odour	-	IS [illegible]	Agreeable	Agreeable	Agreeable
10	pH	-	IS [illegible]	6.5 to 8.5	No relaxation	[illegible]
11	Sulphate (as SO4)	mg/l	IS [illegible]	200	400	[illegible]
12	Total dissolved solids	mg/l	IS [illegible]	500	2000	[illegible]
13	Turbidity	NTU	IS [illegible]	1	5	[illegible]
14	Total hardness (as CaCO3)	mg/l	IS [illegible]	200	600	[illegible]
15	**Chemical Testing 2. Heavy Metals in Water**					
16	Arsenic (as As)	mg/l	IS [illegible]	[illegible]	No relaxation	[illegible]
17	Aluminium (as Al)	mg/l	IS [illegible]	[illegible]	0.3	[illegible]
18	Boron	mg/l	IS [illegible]	0.5	2.4	[illegible]
19	Copper (as Cu)	mg/l	IS [illegible]	[illegible]	1.5	[illegible]
20	Cadmium (as Cd)	mg/l	IS [illegible]	[illegible]	No relaxation	[illegible]
21	Iron (as Fe)	mg/l	IS [illegible]	1.0	No relaxation	[illegible]
22	Lead (as Pb)	mg/l	IS [illegible]	[illegible]	No relaxation	[illegible]
23	Manganese (as Mn)	mg/l	IS [illegible]	0.1	0.3	[illegible]
24	Nickel (as Ni)	mg/l	IS [illegible]	[illegible]	No relaxation	[illegible]
25	Selenium (as Se)	mg/l	IS [illegible]	[illegible]	No relaxation	[illegible]
26	Total Chromium (as Cr)	mg/l	IS [illegible]	[illegible]	No relaxation	[illegible]
27	Zinc (as Zn)	mg/l	IS [illegible]	5	15	[illegible]

[illegible]

Verified By: [illegible] | [illegible] | Authorised Signatory: [illegible]

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Anacon Laboratories Pvt. Ltd. Nagpur Lab
Q FP-34, 35, Food Park, Hing Star Industrial Estate, MIDC Butibori, Nagpur, Maharashtra, India – 441 122
[illegible]

Anacon Laboratories

TC 5453

Test Report

LLR No: [illegible]
Test Report No: [illegible]

Dated [illegible]

Page 1 of 1

Issued To: M/s Western Coalfields Limited (WCL) Nagla Road, Coal Estate, Ch Chora, Nagpur. WCL HQ (WSL) 440001	Sample Inward No.: [illegible] Inward Date: [illegible] Reference: -	Analysis Start: [illegible] Analysis End: [illegible] Sample Category: Water

Sample Name	Sample Particulars/Details	Purpose of Analysis	Quantity Received
Treated Water	Treated Water Of L.P. No. MS Colliery Area	Drinking	1 Ltr

Sample Collected By	Sampling Date / Sampling Time	Sampling Location
Mr. Manish Mahajan	[illegible] Not Mentioned	Inlet

Tests Required: Chemical Testing

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirements as per IS 10500: 2012 (Drinking Water Specifications) Including Amendment No. 1		Test Result
				Acceptable Limit	Permissible Limit	
I	Chemical Testing: Water					
1	Alkalinity	mg/l	IS [illegible]	[illegible]	[illegible]	[illegible]
2	Colour	Hazen	IS [illegible]	5	15	1
3	Chloride (as Cl)	mg/l	IS [illegible]	250	1000	[illegible]
4	Chloride (as Cl)	mg/l	IS [illegible]	25	500	[illegible]
5	Residual Chlorine	mg/l	IS [illegible]	0.2	1	[illegible]
6	Fluoride (as F)	mg/l	IS [illegible]	1.0	1.5	[illegible]
7	Magnesium (as Mg)	mg/l	IS [illegible]	30	100	[illegible]
8	Nitrate (as NO3)	mg/l	APHA method [illegible]	45	No relaxation	[illegible]
9	Odour	-	IS [illegible]	Agreeable	Agreeable	Agreeable
10	pH	-	IS [illegible]	[illegible]	No relaxation	[illegible]
11	Calcium (as [illegible])	mg/l	IS [illegible]	200	1000	[illegible]
12	Total dissolved solids	mg/l	IS [illegible]	500	2000	[illegible]
13	Turbidity	NTU	IS [illegible]	1	5	[illegible]
14	Total hardness (as CaCO3)	mg/l	IS [illegible]	200	600	[illegible]
II	Chemical Testing: Boundary Water					
15	Arsenic (as As)	mg/l	IS [illegible]	0.01	No relaxation	[illegible]
16	Aluminium (as Al)	mg/l	IS [illegible]	0.03	0.2	[illegible]
17	Boron	mg/l	IS [illegible]	0.5	2.4	[illegible]
18	Copper (as Cu)	mg/l	IS [illegible]	0.05	1.5	[illegible]
19	Cadmium (as Cd)	mg/l	IS [illegible]	0.003	No relaxation	[illegible]
20	Iron (as Fe)	mg/l	IS [illegible]	1.0	No relaxation	[illegible]
21	Lead (as Pb)	mg/l	IS [illegible]	0.01	No relaxation	[illegible]
22	Manganese (as Mn)	mg/l	IS [illegible]	0.1	0.3	[illegible]
23	Nickel (as Ni)	mg/l	IS [illegible]	0.02	No relaxation	[illegible]
24	Selenium (as Se)	mg/l	IS [illegible]	0.01	No relaxation	[illegible]
25	Total Chromium (as Cr)	mg/l	IS [illegible]	0.05	No relaxation	[illegible]
26	Zinc (as Zn)	mg/l	IS [illegible]	5	15	[illegible]

Note: [illegible]

Verified By

Technical Manager

Deputy Technical Manager

Authorised Signatory

Deputy Regional Manager

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[illegible]
(Regd.) www.anaconlaboratories.com

Anacon Laboratories

TC 5492

Test Report

LIR No: [illegible]
Test Report No.: [illegible]

Date: [illegible]

Page 1 of 1

Issued To: [illegible] Limited (WTL) [illegible]	Sample Inward No.: [illegible] Inward Date: [illegible] Reference:	Analysis Start: [illegible] Analysis End: [illegible] Sample Category: [illegible]

Sample Name	Sample Particulars/Details	Purpose of analysis	Quantity Received
Ground Water	Ground Water (Well No.: [illegible] Mouza Area)	Drinking	1 Ltr

Sample Collected By	Sampling Date / Sampling Time	Sampling Location
Mr. Mahesh Mahajan	Sampling Date: [illegible] Sampling Time: Not Mentioned	Within

Tests Requested: Alkalinity, Colour, Chloride, Calcium, Residual Chlorine, Fluoride, Magnesium, Nitrate, Nitrite, pH, Sulphate, TDS, Turbidity, Total Hardness, Arsenic, Aluminium, Boron, Copper, Cadmium, Iron, Lead, Manganese, Nickel, Selenium, Total Chromium, Zinc.

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 - 2012 (Drinking Water Specification) Including Amendment No. 1		Test Result
				Acceptable Limit	Permissible Limit #	
1	**Chemical Testing 1. Water**					
1	Alkalinity	mg/l	IS 3025 (Part 23) : 1986	200	600	360.0
2	Colour	Hazen	IS 3025 (Part 4) : 2021	5	15	1
3	Chloride (Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	161.98
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	15
5	Residual Chlorine	mg/l	IS 3025 (Part 26) : 2021	0.2	1	[illegible]
6	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	0.73
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 2014	30	100	[illegible]
8	Nitrate (as NO_3)	mg/l	APHA method (No minimum) 2017	45	No relaxation	11.28
9	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11) : 2022	6.5 to 8.5	No relaxation	7.73
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24) : 2022	200	400	31.75
12	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	92
13	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.4
14	Total hardness (as CaCO3)	mg/l	IS 3025 (Part 21) : 2009	200	600	400
15	**Chemical Testing 2. Heavy Metals Water**					
15	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 2023	0.01	No relaxation	[illegible]
16	Aluminium (as Al)	mg/l	IS 3025 (Part 2) : 2019	0.03	0.2	[illegible]
17	Boron	mg/l	IS 3025 (Part 2) : 2019	0.5	2.0	[illegible]
18	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	[illegible]
19	Cadmium (as Cd)	mg/l	IS 3025 (Part 2) : 2019	0.003	No relaxation	[illegible]
20	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	1.0	No relaxation	[illegible]
21	Lead (as Pb)	mg/l	IS 3025 (Part 2) : 2019	0.01	No relaxation	[illegible]
22	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	[illegible]
23	Nickel (as Ni)	mg/l	IS 3025 (Part 2) : 2019	0.02	No relaxation	[illegible]
24	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2003	0.01	No relaxation	[illegible]
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation	[illegible]
26	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	[illegible]

NOTE: [illegible]

[illegible] As mentioned in the above results, the samples [illegible] IS 10500 : 2012, for sec. 1, 2, 5, 12, 14 & 15 [illegible] however, the results which are [illegible] with respect to the tested parameters. It can be used for drinking purpose in absence of any alternate source.

Verified By: [illegible]

Authorized Signatory: [illegible]

[illegible] We put in lot of hard work to ensure **Customer is not** [illegible] a code to ensure that your next experience will be significantly better. We welcome your feedback over email on [illegible]

Anacon Laboratories Pvt. Ltd. Nagpur Lab
[illegible] Nagpur, Maharashtra, India - 441 122
[illegible]
[illegible]

Anacon Laboratories

TC 5468

Test Report

LIR No.: [illegible]
Test Report No.: [illegible]

Dated: [illegible]

Page 1 of 1

Issued To: M/s Western Coalfields Limited (WCL) Trade Road, Coal Estate, C.P. Lines, Nagpur, MC: [illegible], [illegible]	Sample Received No.: [illegible] Received Date: [illegible] Reference: -	Analysis Start: [illegible] Analysis End: [illegible] Sample Category: [illegible]

Sample Name	Sample Particulars/Details	Purpose of analysis	Quantity Received
Ground Water	Ground Water (Well No: [illegible]) (Nagar Area)	Drinking	1 Ltr

Sample Collected By	Sampling Date / Sampling Time	Sampling Location
Mr. Mahesh Mahajan	[illegible] Not Mentioned	Nagpur TV

Tests Requested: Chemical Testing

TEST RESULTS

S.No.	Test Parameter	Measurement Unit	Test Method	Acceptable Limit	Permissible Limit	Test Result
				Requirements as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 1		
I	**Chemical Testing: Water**					
1	Alkalinity	mg/l	IS 3025 (Part 23) : 1986	200	600	[illegible]
2	Colour	Hazen	IS 3025 (Part 4) : 2021	5	15	1
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	[illegible]
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 2001	75	200	[illegible]
5	Residual Chlorine	mg/l	IS 3025 (Part 26) : 2021	0.1	1	[illegible]
6	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	[illegible]
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	[illegible]
8	Nitrate (as NO3)	mg/l	APHA method (Ion selective) 2017	45	No relaxation	[illegible]
9	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11) : 2017	6.5 to 8.5	No relaxation	[illegible]
11	Sulphate (as SO4)	mg/l	IS 3025 (Part 24) : 2017	200	400	[illegible]
12	Total dissolved solids (TDS)	mg/l	IS 3025 (Part 16) : 1984	500	2000	[illegible]
13	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	[illegible]
14	Total hardness (as CaCO3)	mg/l	IS 3025 (Part 21) : 2009	200	600	[illegible]
II	**Chemical Testing: Heavy Metals in Water**					
15	Cadmium (as Cd)	mg/l	IS 3025 (Part 41) : 2017	0.003	No relaxation	[illegible]
16	Chromium (as Cr)	mg/l	IS 3025 (Part 52) : 2003	0.05	0.5	[illegible]
17	Boron	mg/l	IS 3025 (Part 57) : 2017	0.5	2.4	[illegible]
18	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 2012	0.05	1.5	[illegible]
19	Copper (as Cu)	mg/l	IS 3025 (Part 42) : 2019	0.05	No relaxation	[illegible]
20	Iron (as Fe)	mg/l	IS 3025 (Part 53) : 2019	1.0	No relaxation	[illegible]
21	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2019	0.01	No relaxation	[illegible]
22	Manganese (as Mn)	mg/l	IS 3025 (Part 59) : 2019	0.1	0.3	[illegible]
23	Nickel (as Ni)	mg/l	IS 3025 (Part 54) : 2019	0.02	No relaxation	[illegible]
24	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2003	0.01	No relaxation	[illegible]
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 52) : 2003	0.05	No relaxation	[illegible]
26	Zinc (as Zn)	mg/l	IS 3025 (Part 86) : 2019	5	15	[illegible]

Certified By:

Technical Manager

Deputy Technical Manager

Technical Manager

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Website: www.anaconlaboratories.com

Anacon Laboratories

TC 5455

Test Report

[illegible]

Issued To: M/s Western Coalfields Limited (WCL) [illegible]	Sample Received No: [illegible] Issued Date: [illegible] Reference: -	Sample Received: [illegible] Analysis Start: [illegible] Sample Category: [illegible]

Sample Name	Sample Particulars Details	Purpose of Analysis	Quantity Received
Ground Water	[illegible]	Drinking	1 Ltr

Sample Collected By	Sampling Date / Sampling Time	Sampling Location
Mr. Hitesh Mahajan	[illegible] / Not Mentioned	Nagpur Regional Library

Tests Required: Chemical Testing

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Acceptable Limit	Permissible Limit	Test Result
				Acceptable Limit	Permissible Limit	
I	**Chemical Testing 1. Water**					
1	Alkalinity	mg/l	IS 3025 (Part 23) : 1986	200	600	[illegible]
2	Colour	Hazen	IS 3025 (Part 4) : 2021	5	15	1
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) 1988	250	1000	[illegible]
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	[illegible]
5	Residual Chlorine	mg/l	IS 3025 (Part 26) : 2021	0.2	1	BDL (DL: 0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	0.71
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	[illegible]
8	Nitrate (as NO_3)	mg/l	APHA and ICS Analytical : 2011	45	Not Relaxable	[illegible]
9	Odour	–	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
10	pH	–	IS 3025 (Part 11) : 2022	6.5 to 8.5	Not Relaxable	[illegible]
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24) : 2023	200	400	[illegible]
12	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	[illegible]
13	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) : 2009	200	600	[illegible]
II	**Chemical Testing 2. Residues in Water**					
15	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 2023	0.01	Not Relaxable	BDL (DL : [illegible])
16	Aluminium (as Al)	mg/l	IS 3025 (Part 2) : 2019	0.03	0.2	BDL (DL : [illegible])
17	Boron	mg/l	IS 3025 (Part 2) : 2019	0.5	2.4	BDL (DL : 0.1)
18	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	BDL (DL : [illegible])
19	Cadmium (as Cd)	mg/l	IS 3025 (Part 2) : 2019	0.003	Not Relaxable	BDL (DL : [illegible])
20	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	1.0	Not Relaxable	0.1
21	Lead (as Pb)	mg/l	IS 3025 (Part 2) : 2019	0.01	Not Relaxable	BDL (DL : [illegible])
22	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	0.01
23	Nickel (as Ni)	mg/l	IS 3025 (Part 2) : 2019	0.02	Not Relaxable	BDL (DL : [illegible])
24	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2003	0.01	Not Relaxable	BDL (DL : [illegible])
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	Not Relaxable	BDL (DL : [illegible])
26	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	BDL (DL : [illegible])

NOTE: [illegible]

Verifiedby: [illegible] — Date of Receipt

Reviewed by: [illegible] — Technical Manager

Authorised Signatory: [illegible] — Technical Manager

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Anacon Laboratories Pvt. Ltd. Nagpur Lab
[illegible] Food Park, Five Star Industrial Estate, MIDC Kuhee, Nagpur, Maharashtra, India - 441 122
[illegible]

Anacon Laboratories

TC 5456

Test Report

T.E.R. No.: [illegible]
Test Report No.: [illegible] Date: [illegible] Page: 1 of 1

Issued To: M/S Western Coalfields Limited (WCL) Pathri Road, Gail Bazar, Gadi Ganj, Nagpur, WCL HO [illegible]	Sample Received No.: [illegible] Received Date: [illegible] Reference: -	Analysis Start: [illegible] Analysis End: [illegible] Sample Category: Water

Sample Name	Sample Part / Description	Purpose of Analysis	Quantity Received
Treated Water	Treated Water (Lat. No. [illegible] / Main Area)	Drinking	1 L

Sample Collected By	Sampling Date / Sampling Time	Sampling Location
Mr. Nishesh Mishra	Sampling Date: [illegible] Sampling Time: Not Mentioned	Plant

Test Requested: Chemical Analysis

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirements as per IS 10500:2012 (Drinking Water Specifications) Including Amendment No. 4		Test Results
				Acceptable Limits	Permissible Limits	
I	**Chemical Testing: Water**					
1	Arsenic	mg/l	IS 3025 (Part 37): 2023	0.01	0.05	[illegible]
2	Colour	Hazen	IS 3025 (Part 4): 2021	5	15	1
3	Chloride as Cl	mg/l	IS 3025 (Part 32): 2019	250	1000	[illegible]
4	Cyanide as CN	mg/l	IS 3025 (Part 65): 1994	0.05	0.05	[illegible]
5	Dissolved Oxygen	mg/l	IS 3025 (Part 38): 2021	6.0	-	[illegible]
6	Fluoride as F	mg/l	IS 3025 (Part 60): 2008	1.0	1.5	[illegible]
7	Magnesium as Mg	mg/l	IS 3025 (Part 46): 1994	30	100	[illegible]
8	Nitrate as NO3	mg/l	APHA Standard Method 2017	45	No relaxation	[illegible]
9	Odour	-	IS 3025 (Part 5): 2018	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11): 2022	6.5 to 8.5	No relaxation	7.38
11	Sulphate as SO4	mg/l	IS 3025 (Part 24): 2022	200	400	[illegible]
12	Total dissolved solids	mg/l	IS 3025 (Part 16): 1984	500	2000	[illegible]
13	Turbidity	NTU	IS 3025 (Part 10): 1984	1	5	[illegible]
14	Total Hardness as CaCO3	mg/l	IS 3025 (Part 21): 2009	200	600	[illegible]
II	**Heavy Metals Testing: Boronic Water**					
15	Aluminium as Al	mg/l	IS 3025 (Part 55): 2023	0.03	No relaxation	[illegible]
16	Antimony as Sb	mg/l	IS 3025 (Part 2): 2009	0.02	0.2	[illegible]
17	Boron	mg/l	IS 3025 (Part 2): 2009	0.5	2.4	[illegible]
18	Copper as Cu	mg/l	IS 3025 (Part 2): 2009	0.05	1.5	[illegible]
19	Cadmium as Cd	mg/l	IS 3025 (Part 2): 2009	0.003	No relaxation	[illegible]
20	Barium as Ba	mg/l	IS 3025 (Part 2): 2009	0.7	No relaxation	[illegible]
21	Lead as Pb	mg/l	IS 3025 (Part 2): 2009	0.01	No relaxation	[illegible]
22	Manganese as Mn	mg/l	IS 3025 (Part 2): 2009	0.1	0.3	0.26
23	Nickel as Ni	mg/l	IS 3025 (Part 2): 2009	0.02	No relaxation	[illegible]
24	Selenium as Se	mg/l	IS 3025 (Part 56): 2023	0.01	No relaxation	[illegible]
25	Total Chromium as Cr	mg/l	IS 3025 (Part 2): 2009	0.05	No relaxation	[illegible]
26	Zinc as Zn	mg/l	IS 3025 (Part 2): 2009	5	15	[illegible]

Notes: [illegible]

REMARKS: [illegible]

Certified By: [illegible] Technical Manager; [illegible] Deputy Technical Manager

Authorised Signatory: [illegible] Laboratory Manager

END OF REPORT

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Anacon Laboratories Pvt. Ltd. Nagpur Lab
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[illegible] www.anacon-laboratories.com

Anacon Laboratories

TC 5450

Test Report

FLR No.: [illegible]
Test Report No.: [illegible]

Date: [illegible] | Page 1 of 1

Issued To : M/s [illegible] Limited (WCL) [illegible] Road, [illegible] Nagpur. [illegible]	Sample Received No.: [illegible] Received Date: [illegible] Delivered: -	Analysis Start: [illegible] Analysis End: [illegible] Sample Category: [illegible]	

Sample Name	Sample Description	Date of Sampling	Quantity Received
Treated Water	Treated Water (Mix Flow) MBR [illegible]	[illegible]	[illegible]

Sample Collected By: Mr. [illegible]	Sampling Date: [illegible] Sampling Time: [illegible]	Sampling Location: [illegible]

Tests Requested: Chemical Testing

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirements as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 1		Test Result
				Acceptable Limit	Permissible Limit	
I	**Chemical Testing 1. Water**					
1	Alkalinity	mg/l	IS [illegible] : 1985	200	600	[illegible]
2	Colour	Hazen	IS 3025 (Part 4) : 2021	5	15	1
3	Chloride as Cl	mg/l	IS 3025 (Part 32) 1988	250	1000	[illegible]
4	Calcium as Ca	mg/l	IS 3025 (Part 40) : 1991	75	200	119
5	Residual Chlorine	mg/l	IS 3025 (Part 26) : 2021	0.2	1	BDL (DL: 0.1)
6	Fluoride as F	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	0.57
7	Magnesium as Mg	mg/l	IS 3025 (Part 46) : 1994	30	100	24.19
8	Nitrate as NO_3	mg/l	APHA method (Phenolsulphonic) 2023	45	No relaxation	17.28
9	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
10	pH		IS 3025 (Part 11) : 2023	6.5 to 8.5	No relaxation	7.25
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24) : 2023	200	400	17.66
12	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	337
13	Turbidity	NTU	IS 3025 (Part 10) 1984	1	5	0.5
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) 2009	200	600	100
II	**Chemical Testing 2. Residues in Water**					
15	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 2012	0.05	No relaxation	BDL (DL : 0.01)
16	Aluminium (as Al)	mg/l	IS 3025 (Part 55) : 2016	0.03	0.2	BDL (DL : 0.01)
17	Boron	mg/l	IS 3025 (Part 57) : 2019	1.0	2.4	BDL (DL : 0.1)
18	Copper (as Cu)	mg/l	IS 3025 (Part 42) : 2019	0.05	1.5	BDL (DL : 0.01)
19	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 2019	0.05	No relaxation	BDL (DL : 0.005)
20	Iron (as Fe)	mg/l	IS 3025 (Part 53) : 2019	1.0	No relaxation	BDL (DL : 0.01)
21	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2019	0.01	No relaxation	BDL (DL : 0.005)
22	Manganese (as Mn)	mg/l	IS 3025 (Part 59) : 2019	0.1	0.3	0.08
23	Nickel (as Ni)	mg/l	IS 3025 (Part 54) : 2019	0.02	No relaxation	BDL (DL : 0.01)
24	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2003	0.01	No relaxation	BDL (DL : 0.005)
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 52) : 2019	0.05	No relaxation	BDL (DL : 0.01)
26	Zinc (as Zn)	mg/l	IS 3025 (Part 27) : 2019	5	15	BDL (DL : 0.01)

Notes: [illegible]

REMARKS: [illegible]

Prepared by: [illegible] Technical Manager

Checked by: [illegible] Deputy Technical Manager

Authorized Signatory: [illegible] Quality Manager

Anacon Laboratories Pvt. Ltd. Nagpur Lab
[illegible]

Anacon Laboratories

TC 5458

Test Report

U.R. No: [illegible] Test Report No: [illegible]	Date: [illegible]	Page 1 of 1
Name & Ex: M/s Wonder Cast [illegible] Limited (WCL) [illegible] Road, Civil [illegible], Nagpur, ATT: [illegible]	Sample Received No: [illegible] Record Date: [illegible] Reference: -	Analysis Start: [illegible] Analysis End: [illegible] Sample Category: Water

Sample Name	Sample Particulars Details	Purpose of Analysis	Quantity Received
Treated Water	[illegible]	Testing	[illegible]

Sample Collected By	Sampling Date / Sampling Time	Sampling Location
Mr. [illegible]	[illegible] / N.A. [illegible]	[illegible]

Tests Requested: Chemical Analysis

DESCRIPTION

S.No.	Test Parameter	Measurement Unit	Test Method	Requirements as per IS 10500 : 2012 (Drinkable Water Specifications) Including Amendment No. 1		Test Result
				Acceptable Limit	Permissible Limit	
I	**Chemical Testing: Water**					
1	Alkalinity	mg/l	IS 3025 (Part 23) : 1986	200	600	[illegible]
2	Colour	Hazen	IS 3025 (Part 4) : 2021	5	15	[illegible]
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	[illegible]
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	[illegible]
5	Residual Chlorine	mg/l	IS 3025 (Part 26) : 2021	0.2	1	BDL (DL : 0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	[illegible]
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	[illegible]
8	Nitrate (as NO_3)	mg/l	APHA (latest 23rd edition, 2017)	45	No relaxation	[illegible]
9	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11) : 2023	6.5 to 8.5	No relaxation	[illegible]
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24) : 2022	200	400	[illegible]
12	Total dissolved solids (TDS)	mg/l	IS 3025 (Part 16) : 1984	500	2000	[illegible]
13	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	[illegible]
14	Total hardness (as CaCO3)	mg/l	IS 3025 (Part 21) : 2009	200	600	[illegible]
II	**Chemical Testing: Inorganic Water**					
15	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 2023	0.05	No relaxation	BDL (DL : 0.01)
16	Aluminium (as Al)	mg/l	IS 3025 (Part 55) : 2003	0.03	0.2	BDL (DL : 0.01)
17	Boron	mg/l	IS 3025 (Part 57) : 2005	0.5	2.4	BDL (DL : 0.01)
18	Copper (as Cu)	mg/l	IS 3025 (Part 42) : 2022	0.05	1.5	BDL (DL : 0.01)
19	Cadmium (as Cd)	mg/l	IS 3025 (Part 41) : 2010	0.003	No relaxation	BDL (DL : 0.001)
20	Iron (as Fe)	mg/l	IS 3025 (Part 53) : 2003	0.3	No relaxation	BDL (DL : 0.01)
21	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2023	0.01	No relaxation	BDL (DL : 0.005)
22	Manganese (as Mn)	mg/l	IS 3025 (Part 59) : 2003	0.1	0.3	BDL
23	Nickel (as Ni)	mg/l	IS 3025 (Part 54) : 2003	0.02	No relaxation	BDL (DL : 0.01)
24	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2003	0.01	No relaxation	BDL (DL : 0.005)
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 52) : 2014	0.05	No relaxation	BDL (DL : 0.01)
26	Zinc (as Zn)	mg/l	IS 3025 (Part 27) : 2014	5	15	BDL (DL : 0.01)

[illegible]

Certified By:

Technical Manager

Authorized By:
Deputy Technical Manager

Authorized Signatory:
Deputy Quality Manager

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[illegible] Email: info@anacon.co.in
Website: www.anaconlaboratories.com

Anacon
Laboratories

TC 5458

Test Report

ULR No.- TC5458[illegible]F
Test Report No.: ALPL[illegible]

Dated [illegible].2023

Page 1 of 1

Issued To: M/s. Western Coalfields Limited (WCL) [illegible] Coal Estate, Civil Lines, Nagpur [illegible]	Sample Inward No. [illegible] Inward Date [illegible].2023 Reference —	Analysis Start [illegible].2023 Analysis End [illegible].2023 Sample Category: Water

Sample Name	Sample Particulars/Details	Purpose of analysis	Quantity Received
Ground Water	Ground Water (Well No. [illegible])	Drinking	1 Ltr

Sample Collected By	Sampling Date / Sampling Time	Sampling Location
Mr. Mahesh [illegible]	Sampling Date: 06.06.2023 Sampling Time: Not Mentioned	[illegible]

Tests Required: Chemical Testing

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specification) Including Amendment No. 1		Test Result
				Acceptable Limit	Permissible Limit #	
I	Chemical Testing 1. Water					
1	Alkalinity	mg/l	IS 3025 (Part 23) : 1986	200	600	252.2
2	Colour	Hazen	IS 3025 (Part 4) : 2021	5	15	1
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	173.78
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	120.6
5	Residual Chlorine	mg/l	IS 3025 (Part 26) : 2021	0.2	1	BDL (DL-0.2)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	0.52
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	30.60
8	Nitrate (as NO3)	mg/l	APHA 23rd Ed. 2017	45	No relaxation	20.23
9	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11) : 2022	6.5 - 8.5	No relaxation	7.21
11	Sulphate (as SO4)	mg/l	IS 3025 (Part 24) : 2022	200	400	20.41
12	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	852
13	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.2
14	Total hardness (as CaCO3)	mg/l	IS 3025 (Part 21) : 2009	200	600	408
II	Chemical Testing 2. Residues In Water					
15	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 2022	0.01	No relaxation	BDL (DL - 0.01)
16	Aluminium (as Al)	mg/l	IS 3025 (Part 2) : 2019	0.03	0.2	BDL (DL - 0.01)
17	Boron	mg/l	IS 3025 (Part 2) : 2019	0.5	2.4	BDL (DL - 0.1)
18	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	BDL (DL - 0.03)
19	Cadmium (as Cd)	mg/l	IS 3025 (Part 2) : 2019	0.003	No relaxation	BDL (DL - 0.001)
20	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	1.0	No relaxation	0.05
21	Lead (as Pb)	mg/l	IS 3025 (Part 2) : 2019	0.01	No relaxation	BDL (DL - 0.001)
22	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	0.17
23	Nickel (as Ni)	mg/l	IS 3025 (Part 2) : 2019	0.02	No relaxation	BDL (DL - 0.01)
24	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2003	0.01	No relaxation	BDL (DL - 0.001)
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation	BDL (DL - 0.01)
26	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	BDL (DL - 0.1)

NOTE: [illegible] "Anacon Labs" [illegible] ■ [illegible] "mg/l" is equivalent to "ppm" ■ BDL: Below detection limit ■ DL: [illegible] considered as "Absent".

REMARKS: As requested by the client, sample was tested for above parameters [illegible] IS 10500 : 2012. For test no. 1, 4, 7, 12, 14 & 22 sample exceeds acceptable limits, however, [illegible]

Verified By

Technical Manager

Deputy Technical Manager

Authorized Signatory

Deputy Quality Manager

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Test Report

ULR No.: TC5458[illegible]
Test Report No.: ALPL/2408/[illegible]

Date: [illegible]

Page 1 of 2

Issued To : M/s Western Coalfields Limited (WCL) [illegible] Coal Estate, Civil Lines, Nagpur WCL HQ (MH) [illegible]	Sample Inward No.: ALPL/[illegible] Inward Date: [illegible] Reference: -	Analysis Start: [illegible] Analysis End: [illegible] Sample Category: Water
Sample Name: Ground Water	Sample Particulars/Details: Ground Water (GW) [illegible]	Purpose / Condition: Drinking Quantity Received: 1 Ltr
Sample Collected By: Mr. Mahesh [illegible]	Sampling Date: [illegible] Sampling Time: Not Mentioned	Sampling Location: [illegible]
Tests Required: Chemical Testing		

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specification) Including Amendment No. 1		Test Result
				Acceptable Limit	Permissible Limit *	
I	Chemical Testing 1. Water					
1	Alkalinity	mg/l	IS 3025 (Part 23) : 1986	200	600	182.6
2	Colour	Hazen	IS 3025 (Part 4) : 2021	5	15	1
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	197.51
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	133.6
5	Residual Chlorine	mg/l	IS 3025 (Part 26) : 2021	0.2	1	BDL (DL - 0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	0.32
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	49.67
8	Nitrate (as NO3)	mg/l	APHA method 23rd edition, 2017	45	No relaxation	12.89
9	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11) : 2022	6.5 to 8.5	No relaxation	7.37
11	Sulphate (as SO4)	mg/l	IS 3025 (Part 24) : 2022	200	400	22.32
12	Total Dissolved Solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	1040
13	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.4
14	Total Hardness (as CaCO3)	mg/l	IS 3025 (Part 21) : 2009	200	600	576
II	Chemical Testing 2. Residues in Water					
15	Arsenic (as As)	mg/l	IS 3025 (Part 2) : 2019	0.01	No relaxation	BDL (DL - 0.01)
16	Aluminium (as Al)	mg/l	IS 3025 (Part 2) : 2019	0.03	0.2	BDL (DL - 0.01)
17	Boron	mg/l	IS 3025 (Part 2) : 2019	0.5	2.4	BDL (DL - 0.1)
18	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	BDL (DL - 0.05)
19	Cadmium (as Cd)	mg/l	IS 3025 (Part 2) : 2019	0.003	No relaxation	BDL (DL - 0.001)
20	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	1.0	No relaxation	BDL (DL - 0.01)
21	Lead (as Pb)	mg/l	IS 3025 (Part 2) : 2019	0.01	No relaxation	BDL (DL - 0.005)
22	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	0.21
23	Nickel (as Ni)	mg/l	IS 3025 (Part 2) : 2019	0.02	No relaxation	BDL (DL - 0.01)
24	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2003	0.01	No relaxation	BDL (DL - 0.005)
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation	BDL (DL - 0.005)
26	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	BDL (DL - 0.05)

NOTE: [illegible]

REMARKS: As requested by the client, sample was tested for above parameters only. As per IS 10500 : 2012, for test no. 1, 4, 7, 12, 14 & 22 sample exceeds acceptable limit, [illegible]

Authorised Signatory

Tested By

Technical Manager

Deputy Technical Manager

Quality Manager

END OF REPORT

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Anacon Laboratories

TC 5458

Test Report

ULR No- TC5458[illegible]

Test Report No: AL[illegible]

Dated: [illegible]

Page 1 of 1

Issued To: M/s Reverse Cool Media Limited (RCL) Fanda Road, Cut Estate, Civil Lines, Nagpur. WTP, HQDMSp, NGPL	Sample Inward No.: [illegible] Inward Date: [illegible] Reference: -	Analysis Start: [illegible] Analysis End: [illegible] Sample Category: Water

Sample Name	Sample Particulars/Details	Purpose of analysis	Quantity Received
Ground Water	Ground Water [illegible] Nagpur Area	Drinking	1 Ltr

Sample Collected By Mr. Mukesh Mahajan	Sampling Date: [illegible] Sampling Time: Not Mentioned	Sampling Location Bhandarak Lanty (Gd Tar Ring Canal)

Tests Requested: Chemical Testing

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirements as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 1		Test Result
				Acceptable Limit	Permissible Limit	
I	**Chemical Testing : Water**					
1	Alkalinity	mg/l	IS 3025 (Part 23) : 1986	200	600	232.32
2	Odour	Unit	IS 3025 (Part 5) : 2012	5	15	-
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	107.81
4	Carbonate (as CO_3)	mg/l	IS 3025 (Part 40) : 1991	75	150	0.00
5	Residual Chlorine	mg/l	IS 3025 (Part 26) : 2021	0.2	1	0.0 (DL - 0.1)
6	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 2019	1.0	1.5	0.74
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	31.8
8	Nitrate (as NO_3)	mg/l	APHA method 4500-NO3 E, ed. 2017	45	No relaxation	7.01
9	Odour	-	IS 3025 (Part 5) : 2012	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11) : 2022	6.5 to 8.5	No relaxation	7.34
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24) : 2022	200	400	25.31
12	Total Dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	914
13	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) : 2009	200	600	416
II	**Chemical Testing : Heavy Metals in Water**					
15	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 2022	0.01	No relaxation	BDL (DL - 0.01)
16	Aluminium (as Al)	mg/l	IS 3025 (Part 2) : 2019	0.03	0.2	BDL (DL - 0.03)
17	Barium	mg/l	IS 3025 (Part 2) : 2019	0.1	2.4	BDL (DL - 0.1)
18	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	BDL (DL - 0.05)
19	Cadmium (as Cd)	mg/l	IS 3025 (Part 2) : 2019	0.0003	No relaxation	BDL (DL - 0.003)
20	Boron (as B)	mg/l	IS 3025 (Part 2) : 2019	1.0	No relaxation	0.17
21	Lead (as Pb)	mg/l	IS 3025 (Part 2) : 2019	0.01	No relaxation	BDL (DL - 0.01)
22	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	0.2
23	Nickel (as Ni)	mg/l	IS 3025 (Part 2) : 2019	0.02	No relaxation	BDL (DL - 0.02)
24	Selenium (as Se)	mg/l	IS 3025 (Part 31) : 2022	0.01	No relaxation	BDL (DL - 0.01)
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation	BDL (DL - 0.05)
26	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	BDL (DL - 0.1)

NOTE: [illegible]

Tested By: [illegible] Technical Manager

[illegible] Deputy Technical Manager

Authorised Signatory: [illegible] Technical Manager

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Anacon Laboratories Pvt. Ltd. Nagpur Lab
[illegible]

Anacon Laboratories

TC 5456

Test Report

UCR No.: TC5042[illegible]
Test Report No.: [illegible]

Dated: [illegible]

Page 1 of 1

Issued To: M/s Western Coalfields Limited (WCL) Pandri Road, Civil Lines, Civil Lines, Nagpur, WCL [illegible]	Sample Inward No.: [illegible] Inward Date: [illegible] Reference: -	Analysis Start: [illegible] Analysis End: [illegible] Sample Category: Water

Sample Name	Sample Particulars/Details	Purpose of analysis	Quantity Received
Treated Water	Given [illegible] Well No. [illegible] (Right Area)	Drinking	1 Ltr
Sample Collected By: M/s Mahan [illegible]	Sampling Date: [illegible] Sampling Time: Not Mentioned	Sampling Location: Treated Water	

Test Requested: Chemical Testing

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 1		Test Result
				Acceptable Limit	Permissible Limit	
I	Chemical Testing: 1. Water					
1	Alkalinity	mg/l	IS 3025 (Part 23) : 1986	200	600	[illegible]
2	Colour	Hazen	IS 3025 (Part 4) : 2021	5	15	5
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 2019	250	1000	[illegible]
4	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 1986	0.05	0.05	[illegible]
5	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	0.7	1.5	[illegible]
6	Iron (as Fe)	mg/l	IS 3025 (Part 53) : 2003	1.0	1.5	[illegible]
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	[illegible]
8	Nitrate (as NO_3)	mg/l	APHA method 4500-NO3 B (2017)	45	No relaxation	[illegible]
9	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11) : 2022	6.5 to 8.5	No relaxation	[illegible]
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24) : 2022	200	400	[illegible]
12	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	[illegible]
13	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.2
14	Total hardness (as CaCO3)	mg/l	IS 3025 (Part 21) : 2009	200	600	[illegible]
II	Chemical Testing: 2. Metals in Water					
15	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 2007	0.01	No relaxation	BDL (DL - 0.01)
16	Aluminium (as Al)	mg/l	IS 3025 (Part 55) : 2009	0.03	0.2	BDL (DL - 0.01)
17	Boron	mg/l	IS 3025 (Part 57) : 2009	0.5	2	BDL (DL - 0.01)
18	Copper (as Cu)	mg/l	IS 3025 (Part 42) : 2019	0.05	1.5	BDL (DL - 0.01)
19	Cadmium (as Cd)	mg/l	IS 3025 (Part 41) : 2017	0.003	No relaxation	BDL (DL - 0.001)
20	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2019	0.01	No relaxation	BDL (DL - 0.01)
21	Cadmium (as Cd)	mg/l	IS 3025 (Part 41) : 2017	0.003	No relaxation	BDL (DL - 0.001)
22	Manganese (as Mn)	mg/l	IS 3025 (Part 59) : 2019	0.1	0.3	0.01
23	Nickel (as Ni)	mg/l	IS 3025 (Part 54) : 2019	0.02	No relaxation	BDL (DL - 0.01)
24	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2003	0.01	No relaxation	BDL (DL - 0.001)
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 52) : 2019	0.05	No relaxation	BDL (DL - 0.01)
26	Zinc (as Zn)	mg/l	IS 3025 (Part 63) : 2019	5	15	BDL (DL - 0.1)

NOTE: [illegible]

Verified By

Laboratory Chemist

Technical Manager

Deputy Technical Manager

Laboratory Chemistry

Deputy Manager

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Anacon Laboratories

ISO 9456

Test Report

[illegible]

Dated [illegible]

Issued To: M/s Western Coal Fields Limited (WCL) Lalpa Road, Civil Lines, Civil Lines, Nagpur [illegible]	Sample Received No: [illegible] Issued Date: [illegible] Reference: -	Analysis Start: [illegible] Analysis End: [illegible] Sample Category: Water

Sample Name Ground Water	Sample Description Details Ground Water (Well No. [illegible] (Major Area)	Purpose of analysis Drinking	Quantity Received 1 Ltr
Sample Collected By Mr. Mukesh Mahale	Sampling Date: [illegible] Sampling Time: Not Mentioned	Sampling Location Local	

Tests Requested: Chemical Testing

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specification) Including Amendment No. 1		Test Result
				Acceptable Limit	Permissible Limit *	
I	Chemical Testing 1. Water					
1	Alkalinity	mg/l	IS 3025 (Part 23) : 1986	200	600	205.5
2	Odour	Hours	IS 3025 (Part 5) : 2012	5	15	
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	175 mg/l
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	[illegible]
5	Residual Chlorine	mg/l	IS 3025 (Part 26) : 2022	0.2	1	BDL (DL - 0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	0.65
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	0.366
8	Nitrate (as NO_3)	mg/l	APHA method 4500-NO3 B 2017	45	No relaxation	0.04
9	Odour	-	IS 3025 (Part 5) : 2012	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11) : 2022	6.5 to 8.5	No relaxation	7.59
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24) : 2022	200	400	95.31
12	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	805
13	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.3
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) : 2009	200	600	255
II	Chemical Testing 2. Heavy in Water					
15	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 1988	0.01	No relaxation	BDL (DL - 0.01)
16	Aluminium (as Al)	mg/l	IS 3025 (Part 55) : 2003	0.03	0.2	BDL (DL - 0.01)
17	Boron	mg/l	IS 3025 (Part 57) : 2005	0.5	2.4	BDL (DL - 0.01)
18	Copper (as Cu)	mg/l	IS 3025 (Part 42) : 1992	0.05	1.5	BDL (DL - 0.001)
19	Chromium (as Cr)	mg/l	IS 3025 (Part 52) : 2003	0.05	No relaxation	BDL (DL - 0.005)
20	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2017	0.01	No relaxation	BDL (DL - 0.01)
21	Cadmium (as Cd)	mg/l	IS 3025 (Part 41) : 2019	0.003	No relaxation	BDL (DL - 0.0001)
22	Iron	mg/l	IS 3025 (Part 53) : 2003	0.3	0.3	0.12
23	Manganese (as Mn)	mg/l	IS 3025 (Part 59) : 2006	0.1	No relaxation	BDL (DL - 0.001)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 54) : 2003	0.02	No relaxation	BDL (DL - 0.001)
25	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2003	0.01	No relaxation	BDL (DL - 0.001)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 52) : 2003	0.05	No relaxation	BDL (DL - 0.005)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 49) : 1994	5	15	BDL (DL - 0.1)

NOTE: [illegible]

Tested By

Technical Manager

Deputy Technical Manager

Authorised Signatory

Deputy Quality Manager

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Anacon Laboratories Pvt. Ltd. Nagpur Lab
[illegible]

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TC 5468

Test Report

ULR No. [illegible]
Test Report No. [illegible]

Issued On [illegible]

Page 1 of 1

Issued To M/s Waste to Energy India Limited (WEIL) [illegible]	Sample Received No. [illegible] Issued Date [illegible] Reference -	Sample Mark [illegible] Analysis Date [illegible] Sample Category Water

Sample Name Industrial Water	Sample Particulars/Details Channel Water, [illegible]	Purpose of analysis Testing	Quantity Received 1 L
Sample Collected By Mr. [illegible]	Sampling Date [illegible] Sampling Time Not Mentioned	Sampling Location Bhandara	

Test Required: Chemical Testing

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirements as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit	
I	**Chemical Testing : Water**					
1	pH	[illegible]	IS 3025 (Part 11) : 2022	[illegible]	[illegible]	[illegible]
2	Odour	Odour	IS 3025 (Part 5) : 2012	[illegible]	-	[illegible]
3	Colour	[illegible]	IS 3025 (Part 4) : 2021	[illegible]	[illegible]	[illegible]
4	Calcium as Ca	mg/l	IS 3025 (Part 40) : 1991	[illegible]	[illegible]	[illegible]
5	Magnesium as Mg	mg/l	IS 3025 (Part 46) : 2012	[illegible]	[illegible]	[illegible]
6	Total Alkalinity	mg/l	IS 3025 (Part 23) : 1986	[illegible]	[illegible]	[illegible]
7	Chloride as Cl	mg/l	IS 3025 (Part 32) : 1988	[illegible]	[illegible]	[illegible]
8	Nitrate as NO3	mg/l	APHA Method of Analysis 23rd Ed. 2017	[illegible]	Not Mentioned	[illegible]
9	Odour	-	IS 3025 (Part 5) : 2012	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11) : 2022	[illegible]	Not Mentioned	[illegible]
11	Sulphate as SO4	mg/l	IS 3025 (Part 24) : 2023	[illegible]	[illegible]	[illegible]
12	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	[illegible]	[illegible]	[illegible]
13	Turbidity	NTU	IS 3025 (Part 10) : 1984	[illegible]	-	[illegible]
14	Total hardness as CaCO3	mg/l	IS 3025 (Part 21) : 2009	[illegible]	[illegible]	[illegible]
II	**Chemical Testing : Effluent Water**					
15	[illegible]	mg/l	IS 3025 (Part 37) : 2017	[illegible]	Not Mentioned	[illegible]
16	Aluminium as Al	mg/l	IS 3025 (Part 2) : 2021	[illegible]	[illegible]	[illegible]
17	Boron	mg/l	IS 3025 (Part 2) : 2021	[illegible]	[illegible]	[illegible]
18	Copper as Cu	mg/l	IS 3025 (Part 2) : 2021	[illegible]	[illegible]	[illegible]
19	Cadmium as Cd	mg/l	IS 3025 (Part 2) : 2021	[illegible]	Not Mentioned	[illegible]
20	Iron as Fe	mg/l	IS 3025 (Part 2) : 2021	[illegible]	Not Mentioned	[illegible]
21	Lead as Pb	mg/l	IS 3025 (Part 2) : 2021	[illegible]	[illegible]	[illegible]
22	Manganese as Mn	mg/l	IS 3025 (Part 2) : 2021	[illegible]	Not Mentioned	[illegible]
23	Nickel as Ni	mg/l	IS 3025 (Part 2) : 2021	[illegible]	Not Mentioned	[illegible]
24	Silver as Ag	mg/l	IS 3025 (Part 2) : 2021	[illegible]	Not Mentioned	[illegible]
25	[illegible]	mg/l	IS 3025 (Part 2) : 2021	[illegible]	[illegible]	[illegible]
26	[illegible]	mg/l	IS 3025 (Part 2) : 2021	[illegible]	[illegible]	[illegible]

Note: [illegible]

Tested By

[illegible]
Technical Manager

[illegible]
Deputy Technical Manager

[illegible]
Quality Manager

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[illegible]
[illegible]

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TC 5468

Test Report

[illegible]

Issued To: M/s Western Coalfields Limited (WCL) Nandi Road, Coal Estate, Civil Lines, Nagpur, WCL HQ [illegible]	Sample Received No.: [illegible] Received Date: [illegible] Reference: –	Analysis Start: [illegible] Analysis End: [illegible] Sample Category: Water

Sample Name	Sample Particulars/Details	Purpose of analysis	Quantity Received
Ground Water	Gondi Mine (Well No. [illegible]) (Mouza [illegible])	Drinking	1 L

Sample Collected By	Sampling Date / Sampling Time	Sampling Location
Mr. Mukesh Vishwale	Sampling Date: [illegible] Sampling Time: Not Mentioned	[illegible]

Tests Required: Chemical Testing

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Regulation as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit *	
I	**Chemical Testing I. Water**					
1	Alkalinity	mg/l	IS 3025 (Part 23) : 1986	200	600	[illegible]
2	Colour	Hazen	IS 3025 (Part 4) : 2021	5	15	1
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	[illegible]
4	Cyanide (as CN)	mg/l	IS 3025 (Part 48) : 1991	0.05	0.05	[illegible]
5	Residual Chlorine	mg/l	IS 3025 (Part 26) : 2021	0.2	1	BDL (DL = [illegible])
6	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	[illegible]
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	[illegible]
8	Nitrate (as NO3)	mg/l	APHA [illegible] 23rd Ed. : 2017	45	No relaxation	BDL (DL = [illegible])
9	Odour	–	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
10	pH	–	IS 3025 (Part 11) : 2022	6.5 to 8.5	No relaxation	[illegible]
11	Sulphate (as SO4)	mg/l	IS 3025 (Part 24) : 2022	200	400	[illegible]
12	Total Alkalinity/Hardness	mg/l	IS 3025 (Part 21) : 2009	200	600	[illegible]
13	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	[illegible]
14	Total Dissolved Solids (at 103-105 °C)	mg/l	IS 3025 (Part 16) : 2009	500	2000	[illegible]
II	**Chemical Testing II. Heavy Metals**					
15	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 2021	0.01	No relaxation	BDL (DL = [illegible])
16	Aluminium (as Al)	mg/l	IS 3025 (Part 2) : 2019	0.03	0.2	BDL (DL = [illegible])
17	Boron	mg/l	IS 3025 (Part 2) : 2019	0.5	2.4	BDL (DL = [illegible])
18	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	BDL (DL = [illegible])
19	Lead (as Pb)	mg/l	IS 3025 (Part 2) : 2019	0.001	No relaxation	BDL (DL = [illegible])
20	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	1.0	No relaxation	[illegible]
21	Cadmium (as Cd)	mg/l	IS 3025 (Part 2) : 2019	0.003	No relaxation	BDL (DL = [illegible])
22	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	[illegible]
23	Nickel (as Ni)	mg/l	IS 3025 (Part 2) : 2019	0.02	No relaxation	BDL (DL = [illegible])
24	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2003	0.01	No relaxation	BDL (DL = [illegible])
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation	BDL (DL = [illegible])
26	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	BDL (DL = [illegible])

NOTE: [illegible]

Verified By: Mukesh Dhore, Technical Manager

Sai of Pass, Deputy Technical Manager

Authorised Signatory: [illegible], Director

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[illegible] : info@anacon.in
Website : www.anacondlaboratories.com

Anacon Laboratories

NC 5455

Test Report

Issued To : M/s Positive Certified Limited (Pvt. Ltd.) Parsik Road, Civil Estate, [illegible] Nagpur. [illegible]	Sample Inward No. : [illegible] Inward Date : [illegible] Reference : -	Analysis Start : [illegible] Analysis End : [illegible] Sample Category : Water
Sample Name : Ground Water	Sample Description/Details : Ground Water Sample [illegible] Area	Purpose of analysis : Drinking
Sample Collected By : Mr. Manish Waluvir	Sampling Date : Sampling Time : Not Mentioned	Sampling Location : Nagpur
Tests Required : As per job [illegible]		

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	As per IS 10500 : 2012 (Drinking Water Specification) Including Amendment No. 1 Acceptable Limit	Permissible Limit	Test Result
I	Physical Testing of Water					
1	Appearance	-	IS 3025 (Part 5) : 1983	[illegible]	[illegible]	[illegible]
2	Colour	Hazen	IS 3025 (Part 4) : 2021	5	15	1
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	172.70
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	120
5	Residual Chlorine	mg/l	IS 3025 (Part 26) : 1986	0.2	1	[illegible]
6	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	[illegible]
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	[illegible]	[illegible]
8	Total Alkalinity	mg/l	APHA [illegible] 23rd Ed. : 2017	200	No relaxation	[illegible]
9	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11) : 2017	6.5 to 8.5	No relaxation	[illegible]
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24) : 2022	200	400	[illegible]
12	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	[illegible]
13	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	[illegible]
14	Total hardness (as CaCO3)	mg/l	IS 3025 (Part 21) : 2009	200	600	[illegible]
II	Chemical Testing A. Metals in Water					
15	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 2017	0.01	No relaxation	[illegible]
16	Aluminium (as Al)	mg/l	IS 3025 (Part 55) : 2003	0.03	0.2	[illegible]
17	Boron	mg/l	IS 3025 (Part 57) : 2005	0.5	2.4	[illegible]
18	Copper (as Cu)	mg/l	IS 3025 (Part 42) : 2019	0.05	1.5	[illegible]
19	Cadmium (as Cd)	mg/l	IS 3025 (Part 41) : 2019	0.003	No relaxation	[illegible]
20	Iron (as Fe)	mg/l	IS 3025 (Part 53) : 2018	0.3	No relaxation	[illegible]
21	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2019	0.01	No relaxation	[illegible]
22	Manganese (as Mn)	mg/l	IS 3025 (Part 59) : 2018	0.1	0.3	[illegible]
23	Nickel (as Ni)	mg/l	IS 3025 (Part 54) : 2018	0.02	No relaxation	[illegible]
24	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2003	0.01	No relaxation	[illegible]
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 52) : 2003	0.05	No relaxation	[illegible]
26	Zinc (as Zn)	mg/l	IS 3025 (Part 31) : 2017	5	15	[illegible]

NOTE : [illegible]

Checked By

Authorised Signatory

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Anacon Laboratories Pvt. Ltd. Nagpur Lab
[illegible]

Anacon Laboratories

TC 8468

Test Report

TLR No- [illegible]
Test Report No - [illegible]

Issued On [illegible]

Page 1 of 1

Issued To : M/s Western Coalfields Limited (WCL) [illegible] WCL HQ [illegible]	Sample Received No: [illegible] Received Date: [illegible] Reference: -	Analysis Start: [illegible] Analysis End: [illegible]	
		Sample Category: Water	

Sample Name: Drinking Water	Sample Details: Tap Sample Ground Floor, [illegible]	Purpose of Analysis: Routine	Quantity Received: 1 Ltr
Sample Collected By: Mr. Mukesh Gulhane	Sampling Date: [illegible] Sampling Time: Not Mentioned	Sampling Location: [illegible]	
Tests Requested: Chemical Testing			

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirements as per IS 10500 : 2012 Drinking Water Specifications including Amendment No. 1		Test Result
				Acceptable Limit	Permissible Limit	
I	**Chemical Testing - Water**					
1	Alkalinity	mg/l	IS 3025 (Part 23) : 1986	200	600	[illegible]
2	Color	Hazen	IS 3025 (Part 4) : 2021	5	15	[illegible]
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	[illegible]
4	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	[illegible]
5	Iron (as Fe)	mg/l	IS 3025 (Part 53) : 2003	0.3	1	BDL (DL - [illegible])
6	Hardness (as CaCO3)	mg/l	IS 3025 (Part 21) : 2009	200	600	[illegible]
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	[illegible]
8	Nitrate (as NO3)	mg/l	MPCB notified Standards 2017	45	No relaxation	[illegible]
9	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11) : 2022	6.5 to 8.5	No relaxation	[illegible]
11	Sulphate (as SO4)	mg/l	IS 3025 (Part 24) : 2022	200	400	[illegible]
12	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	[illegible]
13	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	[illegible]
14	Total Organic Carbon	mg/l	IS 3025 (Part 44) : 2003	200	600	[illegible]
II	**Chemical Testing - Residues & Toxins**					
15	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 2012	0.01	No relaxation	BDL (DL - [illegible])
16	Chromium (as Cr)	mg/l	IS 3025 (Part 52) : 2003	0.05	0.5	BDL (DL - [illegible])
17	Boron	mg/l	IS 3025 (Part 57) : 2005	0.5	5.0	BDL (DL - [illegible])
18	Copper (as Cu)	mg/l	IS 3025 (Part 42) : 2019	0.05	1.5	BDL (DL - [illegible])
19	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 2019	0.05	No relaxation	BDL (DL - [illegible])
20	Iron (as Fe)	mg/l	IS 3025 (Part 53) : 2019	1.0	No relaxation	[illegible]
21	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2019	0.01	No relaxation	BDL (DL - [illegible])
22	Mercury (as Hg)	mg/l	IS 3025 (Part 48) : 2019	0.001	No relaxation	[illegible]
23	Nickel (as Ni)	mg/l	IS 3025 (Part 54) : 2019	0.02	No relaxation	BDL (DL - [illegible])
24	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2019	0.01	No relaxation	BDL (DL - [illegible])
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 52) : 2019	0.05	No relaxation	BDL (DL - [illegible])
26	Zinc (as Zn)	mg/l	IS 3025 (Part 86) : 2019	5	15	BDL (DL - [illegible])

NOTE: [illegible]

REMARKS: [illegible]

Verified By

Manager
Technical Manager

Deputy Technical Manager

Technical Manager

END OF REPORT

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Anacon Laboratories Pvt. Ltd. Nagpur Lab
[illegible]

Anacon Laboratories

NC 5458

Test Report

Issued To: M/s Vandana Cold Drinks Limited (W.U.) Kalda Road, Coal Canal, Civil Lines, Nagpur, MC: 440001, [illegible]	Sample Received No.: [illegible] Issued Date: [illegible] Reference: –	Sampling Date: [illegible] Analysis End: [illegible]	
Sample Name: Ground Water	Sample For Industry Details: Ground Water [illegible]	Purpose / Intended Use: Drinking	Quantity Received: 1 L
Sample Collected By: M/s Pilkan Marketing	Sampling Date: [illegible] Sampling Time: Not Mentioned	Sampling Location: Bhawan	
Tests Required: Chemical Testing			

DESIRABLE

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS: 10500 : 2012 (Drinking Water Specifications) including Amendment No. 1		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Chemical Testing 1. Water**					
1	Alkalinity	mg/l	IS 3025 (Part 23) : 1986	200	600	[illegible]
2	Color	Hazen	IS 3025 (Part 4) : 2021	5	15	[illegible]
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	[illegible]
4	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 2021	0.05	0.05	[illegible]
5	Residual Chlorine	mg/l	IS 3025 (Part 26) : 2022	0.2	1.0	[illegible]
6	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	[illegible]
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	[illegible]
8	Nitrate (as NO3)	mg/l	IS 3025 (Part 34) : 2021	45	No relaxation	[illegible]
9	Odour		IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
10	pH	–	IS 3025 (Part 11) : 2022	6.5 to 8.5	No relaxation	[illegible]
11	Sulphate (as SO4)	mg/l	IS 3025 (Part 24) : 2023	200	400	[illegible]
12	Total alkalinity as CaCO3	mg/l	IS 3025 (Part 23) : 1986	200	600	[illegible]
13	Turbidity	NTU	IS 3025 (Part 10) : 2024	1	5	[illegible]
14	Total hardness (as CaCO3)	mg/l	IS 3025 (Part 21) : 2009	200	600	[illegible]
II	**Chemical Testing 2. Metals in Water**					
15	Aluminium (as Al)	mg/l	IS 3025 (Part 55) : 2023	0.03	No relaxation	[illegible]
16	Antimony (as Sb)	mg/l	IS 3025 (Part 37) : 2019	0.02	0.2	[illegible]
17	Boron	mg/l	IS 3025 (Part 57) : 2019	0.5	2.4	[illegible]
18	Copper (as Cu)	mg/l	IS 3025 (Part 42) : 2019	0.05	1.5	[illegible]
19	Cadmium (as Cd)	mg/l	IS 3025 (Part 41) : 2019	0.003	No relaxation	[illegible]
20	Iron (as Fe)	mg/l	IS 3025 (Part 53) : 2019	1.0	No relaxation	[illegible]
21	Lead (as Pb)	mg/l	IS 3025 (Part 37) : 2019	0.01	No relaxation	[illegible]
22	Chromium (as Cr)	mg/l	IS 3025 (Part 52) : 2019	0.05	No relaxation	[illegible]
23	Nickel (as Ni)	mg/l	IS 3025 (Part 54) : 2019	0.02	0.07	[illegible]
24	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2019	0.01	No relaxation	[illegible]
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 52) : 2019	0.05	No relaxation	[illegible]
26	Zinc (as Zn)	mg/l	IS 3025 (Part 49) : 2019	5	15	[illegible]

NOTE: [illegible]

Verified By: [illegible] Technical Manager

[illegible] Deputy Technical Manager

Authorised Signatory: [illegible] Technical Manager

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[illegible]
[illegible]

Anacon Laboratories

TC 9458

Test Report

Sample Taken: M/s Western Coalfields Limited(WCL)	Sample Inward No. / Inward Date / Reference	Analysis Start / Analysis End

Sample Name	Sample Particulars/Details	Purpose of analysis	Quantity Received
Ground Water	Ground Water (Well No.- Mc/1) (Open Well)	[illegible]	[illegible]
Sampling Conducted by: M/s [illegible]	Sampling Date: [illegible] / Sampling Time: Not Mentioned	Sampling Location: [illegible]	

Tests Required: [illegible]

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	As per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Results
				Acceptable Limit	Permissible Limit	
I	Chemical Testing 1. Water					
1	Alkalinity	mg/l	IS 3025 (Part 23) : 1986	200	600	[illegible]
2	Colour	Color	IS 3025 (Part 4) : 2021	5	15	1
3	Odour (at 25°C)	Unit	IS 3025 (Part 5) : 2012	Agreeable	Agreeable	Agreeable
4	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	[illegible]
5	Residual Chlorine	mg/l	IS 3025 (Part 26) : 1986	0.2	1.0	[illegible]
6	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	[illegible]
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	[illegible]
8	Nitrate (as NO3)	mg/l	APHA method 4500-NO3- (Method D)	45	No relaxation	[illegible]
9	Odour	-	IS 3025 (Part 5) : 2012	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11) : 2022	6.5 to 8.5	No relaxation	[illegible]
11	Sulphate (as SO4)	mg/l	IS 3025 (Part 24) : 2022	200	400	[illegible]
12	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	[illegible]
13	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	[illegible]
14	Total hardness (as CaCO3)	mg/l	IS 3025 (Part 21) : 2009	200	600	[illegible]
II	Chemical Testing 2. Metals in Water					
15	Cadmium (as Cd)	mg/l	IS 3025 (Part 41) : 2022	0.01	No relaxation	[illegible]
16	Aluminium (as Al)	mg/l	IS 3025 (Part 55) : 2003	0.03	0.2	[illegible]
17	Boron	mg/l	IS 3025 (Part 57) : 2005	0.5	2.4	[illegible]
18	Copper (as Cu)	mg/l	IS 3025 (Part 42) : 2019	0.05	1.5	[illegible]
19	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 2003	0.05	No relaxation	[illegible]
20	Iron (as Fe)	mg/l	IS 3025 (Part 53) : 2003	1.0	No relaxation	[illegible]
21	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2019	0.01	No relaxation	[illegible]
22	Manganese (as Mn)	mg/l	IS 3025 (Part 59) : 2019	0.1	No relaxation	[illegible]
23	Mercury (as Hg)	mg/l	IS 3025 (Part 48) : 2019	0.001	0.001	[illegible]
24	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2018	0.01	No relaxation	[illegible]
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 52) : 2003	0.05	No relaxation	[illegible]
26	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5.00	No relaxation	[illegible]

NOTE: [illegible]

Test Report Issued By: [illegible] Authorised Signatory

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Anacon Laboratories

TC 9458

Test Report

ULR No. [illegible]
Test Report No. [illegible]

Dated [illegible]

Page 1 of 1

Name & To: M/s Western Coalfields Limited (WCL) Bina Area, Coal Estate Civil Lines, Nagpur, WCL [illegible]	Sample Inward No.: [illegible] Inward Date: [illegible] Reference: -	Analysis Start: [illegible] Analysis End: [illegible]
Sample Name: Ground Water	Sample Description/Details: Ground Water Bore Hole No. [illegible]	Purpose of Analysis: Routine	Quantity Received: 1 Ltr
Sample Collected By: Mr. Prabhat Malviya	Sampling Date: [illegible] Sampling Time: [illegible]	Sampling Location: [illegible]
Test Required: Chemical Testing		

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 1		Test Result
				Acceptable Limit	Permissible Limit in	
I	**Chemical Testing 1. Water**					
1	Alkalinity	mg/l	IS 3025 (Part 23) : 1986	200	600	[illegible]
2	Colour	Hazen	IS 3025 (Part 4) : 2021	5	15	1
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	[illegible]
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	[illegible]
5	Residual Chlorine	mg/l	IS 3025 (Part 26) : 1986	0.2	1	[illegible]
6	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	[illegible]
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	[illegible]
8	Nitrate (as NO3)	mg/l	IS 3025 (Part 34) : 1988	45	100	[illegible]
9	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Not relaxable	Agreeable
10	pH	-	IS 3025 (Part 11) : 2022	6.5 to 8.5	Not relaxable	Agreeable
11	Sulphate (as SO4)	mg/l	IS 3025 (Part 24) : 2022	200	400	[illegible]
12	Total Alkalinity	mg/l	IS 3025 (Part 23) : 1986	200	600	[illegible]
13	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	[illegible]
14	Total hardness (as CaCO3)	mg/l	IS 3025 (Part 21) : 2009	200	600	[illegible]
II	**Chemical Testing 2. Metals in Water**					
15	Aluminium (as Al)	mg/l	IS 3025 (Part 55) : 2003	0.03	Not relaxable	[illegible]
16	Iron (Total) (as Fe)	mg/l	IS 3025 (Part 2) : 2019	0.03	0.3	[illegible]
17	Boron	mg/l	IS 3025 (Part 2) : 2019	0.5	2.4	[illegible]
18	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	[illegible]
19	Cadmium (as Cd)	mg/l	IS 3025 (Part 2) : 2019	0.003	Not relaxable	[illegible]
20	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	0.01	Not relaxable	[illegible]
21	Lead (as Pb)	mg/l	IS 3025 (Part 2) : 2019	0.01	Not relaxable	[illegible]
22	Magnesium (as Mg)	mg/l	IS 3025 (Part 2) : 2019	0.01	Not relaxable	[illegible]
23	Nickel (as Ni)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.1	[illegible]
24	Selenium (as Se)	mg/l	IS 3025 (Part 2) : 2019	0.01	Not relaxable	[illegible]
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	Not relaxable	[illegible]
26	Arsenic (as As)	mg/l	IS 3025 (Part 2) : 2019	0.01	Not relaxable	[illegible]

Note: [illegible]

Certified By

Manager

Deputy Technical Manager

Authorised Signatory

Technical Manager

[illegible]

Anacon Laboratories Pvt. Ltd. Nagpur Lab

[illegible]

Anacon Laboratories

IC 5468

Test Report

ULR No: [illegible]
Test Report No: [illegible]

Dated: [illegible]

Page 1 of 1

Issued To: M/s Western Coalfields Limited (WCL) Parsia Tola, Civil Parsia Civil Lines, Nagpur, WCL HQ MSC 440001	Sample Received No: [illegible] Issued Date: [illegible] Reference: -	Analysis Start: [illegible] Analysis End: [illegible] Sample Category: Water

Sample Name: Water	Sample Particulars/Details: Water (Solid Waste (MSW)) (Solid Fruits Juice)	Purpose of Analysis: Drinking	Quantity Received: 2 Ltr
Sample Collected By: Mr. Mahesh Nikhade	Sampling Date: [illegible] Sampling Time: Not Mentioned	Sampling Location: Nagpur	

Tests Required: Alkalinity, Colour, Odor, Ca (as Ca), Residual Chlorine, Chloride, Magnesium, Nitrate, Odour, pH, Sulphate, TDS, Turbidity, Total Hardness, Arsenic, Aluminium, Boron, Copper, Cadmium, Iron, [illegible] Selenium, Total Chromium, Zinc

TEST RESULTS

S.No.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specification) Including Amendment No. 1 & 2		Test Result
				Acceptable Limit	Permissible Limit*	
I	Chemical Testing: Water					
1	Alkalinity	mg/l	IS [illegible] (Part 23) : 1986	200	600	32[illegible]
2	Colour	Hazen	IS [illegible] (Part 4) : 2021	5	15	1
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	170.[illegible]
4	Calcium (as Ca)	mg/l	IS [illegible] (Part 40) : 1991	75	200	61.[illegible]
5	Residual Chlorine	mg/l	IS [illegible] (Part 26) : 2021	0.2	1	BDL(0.01) [illegible]
6	Fluoride (as F)	mg/l	IS [illegible] (Part 60) : 2019	1.0	1.5	0.[illegible]
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	20.[illegible]
8	Nitrate (as NO_3)	mg/l	EPA-[illegible] method 2 (Edition 2017)	45	No relaxation	24.[illegible]
9	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11) : 2022	6.5 to 8.5	No relaxation	7.[illegible]
11	Sulphate (as SO_4)	mg/l	IS [illegible] (Part 24) : 2022	200	400	41.[illegible]
12	Total dissolved solids	mg/l	IS [illegible] (Part 16) : 1984	500	2000	[illegible]
13	Turbidity	NTU	IS [illegible] (Part 10) : 1984	1	5	[illegible]
14	Total hardness (as CaCO3)	mg/l	IS [illegible] (Part 21) : 2009	200	600	25[illegible]
II	Chemical Testing: 2. Heavy Metals Water					
15	Aluminium (as Al)	mg/l	IS 3025 (Part 55) : 2022	0.03	No relaxation	BDL (0.0001)
16	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 2019	0.05	0.2	BDL(0.0001)
17	Boron	mg/l	IS 3025 (Part 57) : 2019	0.5	2.4	BDL (0.[illegible])
18	Copper (as Cu)	mg/l	IS 3025 (Part 42) : 2019	0.05	1.5	BDL (0.[illegible])
19	Cadmium (as Cd)	mg/l	IS 3025 (Part 41) : 2019	0.003	No relaxation	BDL (0.0001)
20	Iron (as Fe)	mg/l	IS 3025 (Part 53) : 2019	0.3	No relaxation	0.1[illegible]
21	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2019	0.01	No relaxation	BDL (0.0001)
22	Manganese (as Mn)	mg/l	IS 3025 (Part 59) : 2019	0.1	0.3	0.2[illegible]
23	Nickel (as Ni)	mg/l	IS 3025 (Part 54) : 2019	0.02	No relaxation	BDL (0.0001)
24	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2019	0.01	No relaxation	BDL (0.0001)
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 52) : 2019	0.05	No relaxation	BDL (0.0001)
26	Zinc (as Zn)	mg/l	IS 3025 (Part 27) : 2019	5	15	[illegible]

NOTE: [illegible] ■ Results shall be indicative to sample received at laboratory. ■ Results shall be indicative to sampling procedure only. ■ Test report shall not be reproduced except in full without written approval of Anacon Labs. ■ Results of Anacon Labs are valid for sample tested only. ■ Perishable samples shall be disposed off after 30 days and in case of non-perishable samples after the date of issue of test report. [illegible] ■ Unless stated otherwise, the results are based on as received basis. ■ mg/l is equivalent to "ppm". ■ BDL : Below Detection Limit. ■ Results shall be based on the most sensitive test method and shall be considered as "absent".

REMARKS: As requested by the client, sample was tested for chemical parameters only. As per IS 10500 : 2012, [illegible] sample found acceptable limits. [illegible] sample found acceptable limits indicates that the water is fit for drinking purpose in absence of any other toxic substances.

Verified By

Shraddha [illegible]
Technical Manager

Vishal Rana
Regional Technical Manager

Authorized Signatory

[illegible] Tripathi
Deputy Quality Manager

——— END OF REPORT ———

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Anacon Laboratories

IC 5458

Test Report

ULR No.: TC[illegible]
Test Report No.: ALPL/[illegible]/06-24

Date: 13/06/2024

Issued To: M/s Western Coalfields Limited (WCL) Pandri Road, Coal Estate, City Lines, Nagpur, WCL HQ MEG, 440001	Sample Received No.: ALPL/[illegible] Issued Date: [illegible] Reference: -	Analysis Start: [illegible] Analysis End: 20.06.2024 Sample Category: Water

Sample Name	Sample Particulars/Details	Purpose of analysis	Quantity Received
Water	Water (Well No.- WS2) (Kital North Area)	Analysis	1 Ltr

Sample Collected By		
Mr. Mukesh Mohurle	Sampling Date: 15/06/2024 Sampling Time: Not Mentioned	Sampling Location: Wardhan

Tests Required: Alkalinity, Colour, Chloride, Calcium, Residual Chlorine, Fluoride, Magnesium, Nitrate, Odour, pH, Sulphate, TDS, Turbidity, Total Hardness, Arsenic, Aluminium, Boron, Copper, Cadmium, Lead, Iron, Manganese, Mercury, Selenium, Total Chromium, Zinc

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirements as per IS 10500:2012 (Including Minor Amendments) Include Amendment No. 4		Test Results
				Acceptable Limit	Permissible Limit	
I	Chemical Testing (Water)					
1	Alkalinity	mg/L	IS 3025 (Part 23) : 1986	200	600	[illegible]
2	Colour	Hazen	IS 3025 (Part 4) : 2021	5	15	1
3	Chloride (as Cl)	mg/L	IS 3025 (Part 32) : 1988	250	1000	[illegible]
4	Calcium (as Ca)	mg/L	IS 3025 (Part 40) : 1991	75	200	[illegible]
5	Residual Chlorine	mg/L	IS 3025 (Part 26) : 2021	0.2	-	BDL (DL - 0.1)
6	Fluoride (as F)	mg/L	IS 3025 (Part 60) : 2008	1.0	1.5	0.62
7	Magnesium (as Mg)	mg/L	IS 3025 (Part 46) : 1994	30	100	[illegible]
8	Nitrate (as NO3)	mg/L	APHA method Third edition 2017	45	No relaxation	BDL (DL - 2)
9	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11) : 2022	6.5 to 8.5	No relaxation	[illegible]
11	Sulphate (as SO4)	mg/L	IS 3025 (Part 24) : 2022	200	400	[illegible]
12	Total dissolved solids	mg/L	IS 3025 (Part 16) : 1984	500	2000	[illegible]
13	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.7
14	Total hardness (as CaCO3)	mg/L	IS 3025 (Part 21) : 2009	200	600	[illegible]
II	Chemical Testing (Additional Water)					
15	Arsenic (as As)	mg/L	IS 3025 (Part 37) : 2022	0.01	No relaxation	BDL (DL - 0.01)
16	Aluminium (as Al)	mg/L	IS 3025 (Part 2) : 2009	0.03	0.2	BDL (DL - 0.01)
17	Boron	mg/L	IS 3025 (Part 2) : 2009	0.5	2.4	BDL (DL - 0.1)
18	Copper (as Cu)	mg/L	IS 3025 (Part 2) : 2009	0.05	1.5	BDL (DL - 0.05)
19	Cadmium (as Cd)	mg/L	IS 3025 (Part 2) : 2009	0.003	No relaxation	BDL (DL - 0.003)
20	Iron (as Fe)	mg/L	IS 3025 (Part 2) : 2009	1.0	No relaxation	0.41
21	Lead (as Pb)	mg/L	IS 3025 (Part 2) : 2009	0.01	No relaxation	BDL (DL - 0.001)
22	Manganese (as Mn)	mg/L	IS 3025 (Part 2) : 2009	0.1	0.3	0.30
23	Nickel (as Ni)	mg/L	IS 3025 (Part 2) : 2009	0.02	No relaxation	BDL (DL - 0.01)
24	Selenium (as Se)	mg/L	IS 3025 (Part 56) : 2003	0.01	No relaxation	BDL (DL - 0.001)
25	Total Chromium (as Cr)	mg/L	IS 3025 (Part 2) : 2009	0.05	No relaxation	BDL (DL - 0.02)
26	Zinc (as Zn)	mg/L	IS 3025 (Part 2) : 2009	5	15	BDL (DL - 0.1)

NOTE: [illegible]

REMARKS: [illegible]

Verified By

Mangesh Fande
Technical Manager

Sonal Rai
Deputy Technical Manager

Authorized Signatory

Deputy Quality Manager

Anacon Laboratories

TC 5468

Test Report

ULR No.: [illegible]
Test Report No.: ALPL/[illegible]/18-19

Dated 28.06.2021

Issued To: M/S Western Coalfields Limited (WCL) Pandri Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S.), 440001	Sample Inward No. ALPL/[illegible] Inward Date [illegible] Reference -	Analysis Start [illegible] Analysis End [illegible] Sample Category Water

Sample Name	Sample Particulars Details	Purpose of analysis	Quantity Received
Water	Water (Well No. [illegible]) (Wani North Area)	Testing	1 Ltr
Sample Collected By	**Sampling Date / Sampling Time**	**Sampling Location**	
Mr. Akshay Mahajan	15/06/2021 / Not Mentioned	Kolar (U.B.)	

Tests Requested: Alkalinity, Colour, Chloride, Calcium, Residual Chlorine, Fluoride, Magnesium, Nitrate, Odour, pH, Sulphate, TDS, Turbidity, Total Hardness, Arsenic, Aluminium, Boron, Copper, Cadmium, Iron, Lead, Manganese, Nickel, Selenium, Total Chromium, etc.

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirements as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 1		Test Result
				Acceptable Limit	Permissible Limit *	
I	Chemical Testing : Water					
1	Alkalinity	mg/l	IS 3025 (Part 23) : 1986	200	600	270.0
2	Colour	Hazen	IS 3025 (Part 4) : 2021	5	15	[illegible]
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	150.0
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	91.2
5	Residual Chlorine	mg/l	IS 3025 (Part 26) : 2021	0.2	1	BDL (DL - 0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	0.98
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	22.10
8	Nitrate (as NO_3)	mg/l	APHA method 4500-NO_3 (Part 34) : 2011	45	No relaxation	[illegible]
9	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11) : 2022	6.5 to 8.5	No relaxation	[illegible]
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24) : 2022	200	400	35.0
12	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	768
13	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.2
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) : 2009	200	600	300
II	Chemical Testing : Heavy Metals in Water					
15	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 2003	0.01	No relaxation	BDL (DL - 0.01)
16	Aluminium (as Al)	mg/l	IS 3025 (Part 5) : 2019	0.03	0.2	BDL (DL - 0.01)
17	Boron	mg/l	IS 3025 (Part 8) : 2019	0.5	2.4	BDL (DL - 0.1)
18	Copper (as Cu)	mg/l	IS 3025 (Part 42) : 2019	0.05	1.5	BDL (DL - 0.01)
19	Cadmium (as Cd)	mg/l	IS 3025 (Part 41) : 2019	0.003	No relaxation	BDL (DL - 0.001)
20	Iron (as Fe)	mg/l	IS 3025 (Part 53) : 2019	1.0	No relaxation	0.56
21	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2019	0.01	No relaxation	BDL (DL - 0.001)
22	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	0.11
23	Nickel (as Ni)	mg/l	IS 3025 (Part 2) : 2019	0.02	No relaxation	BDL (DL - 0.01)
24	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2020	0.01	No relaxation	BDL (DL - 0.001)
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation	BDL (DL - 0.01)
26	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	BDL (DL - 0.1)

NOTE: [illegible]

REMARKS: [illegible]

Verified By

Manjusha Fande
Technical Manager

Sachin Rai
Deputy Technical Manager

Authorized Signatory

Chetan Gurnani
Deputy Quality Manager

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[illegible]
[illegible]

Anacon Laboratories

TC-5456

Test Report

ULR No.- TC546[illegible]
Test Report No.: A[illegible]

Date: [illegible]

Page 1 of 1

Issued To: M/s Western Coalfields Limited (WCL) Fatak Road, Coal Estate, Civil Lines, Nagpur, [illegible]	**Sample Received No.** [illegible] **Received Date** [illegible] **Reference** -	**Analysis Start** [illegible] **Analysis End** [illegible] **Sample Category** Water

Sample Name	Sample Particulars Details	Purpose of Analysis	Quantity Received
Water	Water (Well No.: [illegible] North Area)	Drinking	1 Ltr

Sample Collected By	Sampling Date / Sampling Time	Sampling Location
M/s Mihan Motors	[illegible] / Not Mentioned	Nagpur

Tests Required: Alkalinity, Colour, Chloride, Fluoride, Hardness, Nitrate, Odour, pH, Sulphate, TDS, Turbidity, Total Hardness, Arsenic, Aluminium, Boron, Copper, Cadmium, Iron, Lead, Manganese, Nickel, Selenium, Total Chromium, [illegible]

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Permissible Limit as per IS 10500 : 2012 (Including Water Specification in Drinking Absence of alternate source)		Test Result
				Acceptable Limit	Permissible Limit	
I	**Chemical Testing of Water**					
1	Alkalinity	mg/l	IS 3025 (Part 23) : 1986	200	600	56.25
2	Colour	Hazen	IS 3025 (Part 4) : 2021	5	15	1
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	16.74
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	[illegible]
5	Residual Chlorine	mg/l	IS 3025 (Part 26) : 2021	0.2	1	BDL(DL-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	0.09
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	[illegible]
8	Nitrate (as NO_3)	mg/l	APHA method 4500-NO3 2017	45	No relaxation	[illegible]
9	Odor	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11) : 2022	6.5 to 8.5	No relaxation	8.08
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24) : 2022	200	400	8.99
12	Total Dissolved Solids	mg/l	IS 3025 (Part 16) : 984	500	2000	[illegible]
13	Turbidity	NTU	IS 3025 (Part 10) : 984	1	5	0.7
14	Total hardness (as CaCO3) (TH)	mg/l	IS 3025 (Part 21) : 2009	200	600	304
II	**Chemical Testing: Contaminants in Water**					
15	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 2022	0.01	No relaxation	BDL (DL - 0.01)
16	Aluminium (as Al)	mg/l	IS 3025 (Part 2) : 2019	0.03	0.2	BDL (DL - 0.01)
17	Boron	mg/l	IS 3025 (Part 4) : 2019	0.5	2.4	BDL (DL - 0.1)
18	Copper (as Cu)	mg/l	IS 3025 (Part 3) : 2019	0.05	1.5	BDL (DL - 0.01)
19	Cadmium (as Cd)	mg/l	IS 3025 (Part 3) : 2019	0.003	No relaxation	BDL (DL - 0.003)
20	Iron (as Fe)	mg/l	IS 3025 (Part 3) : 2019	1.0	No relaxation	0.10
21	Lead (as Pb)	mg/l	IS 3025 (Part 3) : 2019	0.01	No relaxation	BDL (DL - 0.004)
22	Manganese (as Mn)	mg/l	IS 3025 (Part 3) : 2019	0.1	0.5	1.5
23	Nickel (as Ni)	mg/l	IS 3025 (Part 3) : 2019	0.02	No relaxation	BDL (DL - 0.01)
24	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2003	0.01	No relaxation	BDL (DL - 0.01)
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 3) : 2019	0.05	No relaxation	BDL (DL - 0.05)
26	Zinc (as Zn)	mg/l	IS 3025 (Part 3) : 2019	5	15	BDL (DL - 0.1)

NOTE: ★ Please see remarks. Original Test Report is issued to the [illegible] ★ [illegible] ★ [illegible] ★ [illegible] ★ [illegible] ★ [illegible] ★ [illegible] ★ [illegible] ★ [illegible] ★ [illegible] ★ [illegible] ★ BDL: Below detection limit. ★ (DL - [illegible]) indicates detection limit of the method used and shall be considered as zero.

REMARKS: As requested by Customer, we have analysed the above sample as per IS 10500 : 2012. As per Table 1, 2, 3, 4 & 5 the results are acceptable limit. However, the result is within permissible limit, but varying from the acceptable limit. It can be used for drinking purpose in absence of alternate source.

Verified By

Minakshi Pande
Technical Manager

Sohil Raza
Deputy Technical Manager

Authorized Signatory

[illegible]
Deputy Quality Manager

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ISO 9001

Test Report

JOB No. [illegible]

Test Report No. [illegible]

Date: [illegible]

Page 1 of 1

Issued To: M/s. Western Coal fields Limited (WCL) Gondi Road, Coal Estate, Civil Lines, Nagpur, WCL HQ, M.S. 440001	Sample Received No. [illegible] Issued Date [illegible] Reference -	Analysis Start [illegible] Analysis End [illegible] Sample Category: Water

Sample Name	Sample Particulars Details	Nature of sample	Quantity Received
Water	Mine Out Area No. [illegible] North Open	Drinking	2 Ltr

Sample Collected By	Sampling Date	Sampling Location
Mr. Mithun Mohanty	Sampling Time: Not Mentioned	Bhatli

Test Required: [illegible]

TEST RESULTS

S.No.	Test Parameter	Measurement Unit	Test Method	Requirements as per IS 10500:2012 (Drinking Water Specifications) Acceptable Limit	Permissible Limit	Test Result
I	General Parameters					
1	Alkalinity	mg/l	IS 3025 (Part 23): 1986	200	600	[illegible]
2	Colour	Hazen	IS 3025 (Part 4): 2021	5	15	1
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32):1988	250	[illegible]	[illegible]
4	Sulphate (as SO_4)	mg/l	IS 3025 (Part 60): 1991	75	200	[illegible]
5	Residual Chlorine	mg/l	IS 3025 (Part 26): 2021	0.2	1	BDL (DL = 0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60): 2008	1.0	1.5	[illegible]
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46): 1994	30	100	[illegible]
8	Nitrate (as NO_3)	mg/l	APHA Standard Methods 2017	45	No relaxation	[illegible]
9	Odour	-	IS 3025 (Part 5): 2012	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11): 2022	6.5 to 8.5	No relaxation	[illegible]
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24): 2022	200	400	[illegible]
12	Total dissolved solids	mg/l	IS 3025 (Part 16): 1984	500	2000	[illegible]
13	Turbidity	NTU	IS 3025 (Part 10): 1984	1	5	[illegible]
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21): 2009	200	600	456
II	Chemical Testing (Metals/Toxic Elements)					
15	Arsenic (as As)	mg/l	IS 3025 (Part 37): 2022	0.01	No relaxation	BDL (DL = 0.01)
16	Aluminium (as Al)	mg/l	IS 3025 (Part 2): 2019	0.03	0.2	BDL (DL = 0.03)
17	Boron	mg/l	IS 3025 (Part 3): 2019	0.5	2.4	BDL (DL = 0.1)
18	Copper (as Cu)	mg/l	IS 3025 (Part 3): 2019	0.05	1.5	BDL (DL = 0.05)
19	Cadmium (as Cd)	mg/l	IS 3025 (Part 3): 2019	0.003	No relaxation	BDL (DL = 0.003)
20	Iron (as Fe)	mg/l	IS 3025 (Part 3): 2019	0.3	No relaxation	0.07
21	Lead (as Pb)	mg/l	IS 3025 (Part 2): 2019	0.01	No relaxation	BDL (DL = 0.005)
22	Manganese (as Mn)	mg/l	IS 3025 (Part 2): 2019	0.1	0.3	0.07
23	Mercury (as Hg)	mg/l	IS 3025 (Part 2): 2019	0.02	No relaxation	BDL (DL = 0.01)
24	Selenium (as Se)	mg/l	IS 3025 (Part 56): 2018	0.01	No relaxation	BDL (DL = 0.005)
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2): 2019	0.05	No relaxation	BDL (DL = 0.02)
26	Zinc (as Zn)	mg/l	IS 3025 (Part 2): 2019	5	15	BDL (DL = 0.1)

NOTE: [illegible]

RECOMMENDATION: [illegible]

Verified By

Technical Manager

Technical Manager

Authorized Signatory

Deputy Manager

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www.anacon[illegible]

Anacon Laboratories

IC 5458

Test Report

T.E.R. No.: TC5458[illegible]

Test Report No.: [illegible]

Dated: [illegible]

Page [illegible] of 1

Issued To: [illegible] Coal Field Ltd. (WCL) [illegible] Nagpur, [illegible]	Sample Received No.: [illegible] Test Start Date: [illegible] Reference: -	Analysis Start: [illegible] Analysis End: [illegible] Sample Category: Water

Sample Name	Sample Particulars/Details	Purpose of Analysis	Quantity Received
Water	Water Bed No. [illegible] Kala North Area	Drinking	1 Ltr

Sample Collected By	Sampling Date / Sampling Time	Sampling Location
Mr. Mahesh Mohan	[illegible] / Not Mentioned	Kanchi Pit

Test Required: Mission [illegible] Colour, Turbidity, Calcium, Residual Chlorine, Phenolic Compounds, Nitrate, Odour, pH, Sulphate, [illegible], Alkalinity, Total Hardness, Sodium, Chloride, Iron, Copper, Cadmium, Total Coliform, Mercury, Nickel, Selenium, Total Chromium, [illegible]

TEST REPORT

S.N.	Test Parameter	Measurement Unit	Test Method	Requirements as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 1		Test Result
				Acceptable Limits	Permissible Limits	
I	General Parameters					
1	[illegible]	mg/l	IS 3025 (Part [illegible]) : 1986	25	40	[illegible]
2	Colour	Hazen	IS 3025 (Part 4) : 2021	5	15	[illegible]
3	Calcium (as Ca)	mg/l	IS 3025 (Part 21) : 1986	75	200	[illegible]
4	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	[illegible]
5	Residual Chlorine	mg/l	IS 3025 (Part 26) : 2021	0.2	1	[illegible]
6	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	[illegible]
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	[illegible]
8	Nitrate (as NO_3)	mg/l	APHA Standard Methods, 2017	45	Not relaxable	[illegible]
9	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11) : 2022	6.5 to 8.5	Not relaxable	[illegible]
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24) : 2022	200	400	[illegible]
12	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	[illegible]
13	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	[illegible]
14	Total hardness (as CaCO3)	mg/l	IS 3025 (Part 21) : 2009	200	600	[illegible]
II	Chemical Testing (Toxic Metals in Water)					
15	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 2022	0.01	Not relaxable	[illegible]
16	Aluminium (as Al)	mg/l	IS 3025 (Part 2) : 2019	0.03	0.2	[illegible]
17	Boron	mg/l	IS 3025 (Part 2) : 2019	0.5	5.0	[illegible]
18	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	[illegible]
19	Cadmium (as Cd)	mg/l	IS 3025 (Part 2) : 2019	0.003	Not relaxable	[illegible]
20	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	1.0	Not relaxable	[illegible]
21	Lead (as Pb)	mg/l	IS 3025 (Part 2) : 2019	0.01	Not relaxable	[illegible]
22	Mercury (as Hg)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.1	[illegible]
23	Nickel (as Ni)	mg/l	IS 3025 (Part 2) : 2019	0.02	Not relaxable	[illegible]
24	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2021	0.01	Not relaxable	[illegible]
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	Not relaxable	[illegible]
26	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	[illegible]

NOTE: [illegible]

REMARKS: [illegible]

Tested By: Swapnil Pandey, Technical Manager

Checked By: Sachin Rai, Quality Control Manager

Authorised Signatory: [illegible], Laboratory Manager

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TC 6458

Test Report

UAR No.: TC5[illegible]
Test Report No.: ALPL/[illegible]/26

Date: [illegible]

Page 1 of 1

Issued To: M/s Western Coalfields Limited (WCL) [illegible] Road, Civil Lines, Civil Lines, Nagpur, MH, 440 [illegible]	Sample Issued No.: [illegible] Issued Date: [illegible] Reference: -	Analysis Start: [illegible] Analysis End: [illegible] Sample Category: Water

Sample Name Water	Sample Particulars/Details Near [illegible] - [illegible] Road, North [illegible]	For purpose of analysis Drinking	Quantity Received [illegible]
Sample Collected By Mr. Mitesh Nakade	Sampling Date: [illegible] Sampling Time: Not Mentioned	Sampling Location Vandgaon	

Tests Required: [illegible]

TEST RESULTS

S.N.	Test Parameters	Measurement Unit	Test Method	Requirements as per IS 10500 : 2012 (Drinking Water Specification) for Drinking (Potable) Water		Test Results
				Acceptable Limit	Permissible Limit	
I	Physical Testing of Water					
1	Alkalinity	mg/l	IS 3025 (Part 23) : 1986	200	600	2012
2	Colour	Hazen	IS 3025 (Part 4) : 2021	5	15	1
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	[illegible]
4	Conductivity (at 25°C)	µS/cm	IS 3025 (Part 14) : 2013	75	300	[illegible]
5	Residual Chlorine	mg/l	IS 3025 (Part 26) : 2021	0.2	1	BDL (0.1 - 0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	[illegible]
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	[illegible]
8	Nitrate (as NO_3)	mg/l	APHA method 4500-NO3 : 2017	45	No relaxation	[illegible]
9	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11) : 2022	6.5 to 8.5	No relaxation	[illegible]
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24) : 2023	200	400	[illegible]
12	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	[illegible]
13	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	[illegible]
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) : 2009	200	[illegible]	[illegible]
II	Chemical Testing of Drinking Water					
15	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 2023	0.01	No relaxation	BDL (0.01 - 0.01)
16	Aluminium (as Al)	mg/l	IS 3025 (Part 2) : 2019	0.03	0.2	BDL (0.01 - 0.01)
17	Boron	mg/l	IS 3025 (Part 2) : 2019	0.5	2.4	BDL (0.1 - 0.1)
18	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	BDL (0.1 - 0.1)
19	Cadmium (as Cd)	mg/l	IS 3025 (Part 2) : 2019	0.003	No relaxation	BDL (0.1 - 0.001)
20	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	0.3	No relaxation	[illegible]
21	Lead (as Pb)	mg/l	IS 3025 (Part 2) : 2019	0.01	No relaxation	BDL (0.1 - 0.001)
22	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	0.01
23	Nickel (as Ni)	mg/l	IS 3025 (Part 2) : 2019	0.02	No relaxation	BDL (0.1 - 0.01)
24	Selenium (as Se)	mg/l	IS 3025 (Part 31) : 2023	0.01	No relaxation	BDL (0.1 - 0.001)
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation	BDL (0.1 - 0.01)
26	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	BDL (0.1 - 0.1)

NOTE: [illegible]

REMARKS: [illegible]

Tested By

Manjeet Panda
Technical Manager

Swati Rao
Deputy Technical Manager

Authorised Signatory

Chhaya Gulve
Deputy Quality Manager

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Anacon Laboratories

TC 5456

Test Report

JOB No.: [illegible]
Test Report No.: ALPL/[illegible]

Dated: [illegible]

Page 1 of 1

Issued To: **M/s Western Coalfields Limited (WCL)** Pench Road, Civil Lines, Coal Estate, Nagpur, WCL HQ (MS), 440001	**Sample Received No.:** ALPL/[illegible] **Received Date:** [illegible] **Reference:** –	**Analysis Start:** [illegible] **Analysis End:** [illegible] **Sample Category:** Water

Sample Name	Sample Particulars/Details	Purpose/Analysis	Quantity Received
Water	Water (RGI No. [illegible]) (Water Sent) [illegible]	Drinking	1 Ltr

Sample Collected By	Sampling Date	Sampling Time	Sampling Location
Mr. Mukesh Mahajan	[illegible]	Not Mentioned	Wanoja

Tests Requested: Alkalinity, Colour, Chloride, Calcium, Residual Chlorine, Fluoride, Magnesium, Nitrate, Nitrite, Sulphate, TDS, Total Hardness, Arsenic, Aluminium, Boron, Copper, Cyanide, Iron, Lead, Manganese, Nickel, Selenium, Total Chromium, Zinc.

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500:2012 (Drinking Water Specifications) Including Amendment No. 1		Test Result
				Acceptable Limit	Permissible Limit	
I	**Chemical Testing (Metals)**					
1	Alkalinity	mg/l	IS 3025 (Part 23): 1986	200	600	20.00
2	Colour	Hazen	IS 3025 (Part 4): 2021	5	15	[illegible]
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32): 1988	250	1000	15.00
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40): 1991	75	200	0.4
5	Residual Chlorine	mg/l	IS 3025 (Part 26): 2022	0.2	–	BDL (DL: 0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60): 2008	1.0	1.5	0.01
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46): 1994	30	100	0.75
8	Nitrate (as NO_3)	mg/l	APHA Standard Methods 2021	45	No relaxation	4.66
9	Nitrite		IS 3025 (Part 2): 2019	Agreeable	Agreeable	Agreeable
10	pH		IS 3025 (Part 11): 2022	6.5 to 8.5	No relaxation	8.09
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24): 2023	200	400	40.22
12	Total dissolved solids	mg/l	IS 3025 (Part 16): 1984	500	2000	265
13	Turbidity	NTU	IS 3025 (Part 10): 1984	1	5	0.3
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21): 2009	200	600	176
II	**Chemical Testing (Toxic Metals)**					
15	Arsenic (as As)	mg/l	IS 3025 (Part 37): 2002	0.01	No relaxation	BDL (DL: 0.01)
16	Aluminium (as Al)	mg/l	IS 3025 (Part 2): 2019	0.03	0.2	BDL (DL: 0.01)
17	Boron	mg/l	IS 3025 (Part 2): 2019	0.5	2.4	BDL (DL: 0.01)
18	Copper (as Cu)	mg/l	IS 3025 (Part 2): 2019	0.05	1.5	BDL (DL: 0.005)
19	Cadmium (as Cd)	mg/l	IS 3025 (Part 2): 2019	0.003	No relaxation	BDL (DL: 0.003)
20	Iron (as Fe)	mg/l	IS 3025 (Part 2): 2019	1.0	No relaxation	0.27
21	Lead (as Pb)	mg/l	IS 3025 (Part 2): 2019	0.01	No relaxation	BDL (DL: 0.001)
22	Manganese (as Mn)	mg/l	IS 3025 (Part 2): 2019	0.1	0.3	0.25
23	Nickel (as Ni)	mg/l	IS 3025 (Part 2): 2019	0.02	No relaxation	BDL (DL: 0.01)
24	Selenium (as Se)	mg/l	IS 3025 (Part 56): 2003	0.01	No relaxation	BDL (DL: 0.01)
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2): 2019	0.05	No relaxation	BDL (DL: 0.005)
26	Zinc (as Zn)	mg/l	IS 3025 (Part 2): 2019	5	15	BDL (DL: 0.1)

NOTE: [illegible]

REMARKS: As specified by the client, sample was tested for drinking purposes only. As per IS 10500 : 2012 Drinking water, [illegible] samples were found [illegible] for drinking purpose in absence of a viable source.

Verified By

Nagesh Pawar
Technical Manager

Mukesh Dube
Deputy Technical Manager

Authorized Signatory

Shailesh Gadkari
Deputy Quality Manager

POINT OF REFERENCE

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[illegible] : info@anacon.in
https://www.anaconlab.com

Anacon Laboratories

TC 5553

Test Report

ULR No. [illegible]
Test Report No. [illegible]

Dated [illegible]

Page 1 of 1

Issued To : Shri Manorama Graphite Limited (M.I.D.C.) [illegible] Nagpur [illegible]	Sample Received No. [illegible] Date of Date [illegible] Reference -	Analysis Start [illegible] Analysis End [illegible] Sample Category Water

Sample Name: Water	Sample Description/Details: Water Bore Near [illegible] (Near Nearby Area)	Purpose of analysis: Drinking	Quantity Received: 1 Ltr
Sample Collected By: Mr. Mahesh Mohale	Sampling Date: [illegible] Sampling Time: Not Mentioned	Sample by Laboratory: Taken	

Test Requested: Alkalinity, Calcium Chloride, Chloride, Residual Chlorine, Phenolic, Magnesium, Nitrate, Nitrite, Sulphate, TDS, Turbidity, Total Hardness, Alkalinity, Aluminium, Boron, Copper, Iron, Lead, Manganese, Nickel, Selenium, Silver, Total Chromium, Zinc

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirements as per IS 10500:2012 (Drinking Water Specifications) Including Amendment No. 1		Test Result
				Acceptable Limit	Permissible Limit	
I	Chemical Testing: Water					
1	Alkalinity	mg/l	IS 3025 (Part 23) : 1986	200	600	[illegible]
2	Colour	Hazen	IS 3025 (Part 4) : 2021	5	15	[illegible]
3	Cl Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	[illegible]
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	[illegible]
5	Residual Chlorine	mg/l	IS 3025 (Part 26) : 1986	0.2		[illegible]
6	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	[illegible]
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	[illegible]
8	Nitrate (as NO_3)	mg/l	APHA method 2700 edition 2017	45	No relaxation	[illegible]
9	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11) : 2022	6.5 to 8.5	No relaxation	[illegible]
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24) : 2022	200	400	[illegible]
12	Total dissolved solids	mg/l	IS 3025 (Part 16) : 2023	500	2000	[illegible]
13	Turbidity	NTU	IS 3025 (Part 10) : 2023	1	5	[illegible]
14	Total Hardness (as CaCO3)	mg/l	IS 3025 (Part 21) : 2009	200	600	[illegible]
II	Chemical Testing: Residues in Water					
15	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 2023	0.01	No relaxation	[illegible]
16	Aluminium (as Al)	mg/l	IS 3025 (Part 28) : 2019	0.03	0.2	[illegible]
17	Boron	mg/l	IS 3025 (Part 31) : 2019	0.5	2.4	[illegible]
18	Copper (as Cu)	mg/l	IS 3025 (Part 42) : 2019	0.05	1.5	[illegible]
19	Cadmium (as Cd)	mg/l	IS 3025 (Part 41) : 2019	0.003	No relaxation	[illegible]
20	Iron (as Fe)	mg/l	IS 3025 (Part 53) : 2019	0.3	No relaxation	[illegible]
21	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2019	0.01	No relaxation	[illegible]
22	Manganese (as Mn)	mg/l	IS 3025 (Part 59) : 2019	0.03	No relaxation	[illegible]
23	Nickel (as Ni)	mg/l	IS 3025 (Part 54) : 2019	0.02	0.1	[illegible]
24	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2019	0.01	No relaxation	[illegible]
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 52) : 2003	0.05	No relaxation	[illegible]
26	Zinc (as Zn)	mg/l	IS 3025 (Part 27) : 2019	5	15	[illegible]

NOTE: [illegible]

DISCLAIMER: [illegible]

Test Done By

Mr. [illegible]
Technical Manager

Mr. [illegible]
Deputy Technical Manager

As Authorized Signatory

[illegible]
Deputy Quality Manager

Thank For putting in your faith and trust in our services. We at Anacon Laboratories [illegible]
We do it a lot of hard work to provide. But you have a [illegible] satisfaction [illegible]
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[illegible]

Anacon Laboratories Pvt. Ltd. Nagpur Lab
[illegible]
[illegible]

Anacon Laboratories

TC 5468

Test Report

ULR No. - TC5482[illegible]
Test Report No. - [illegible]

Dated 26.06.2025

Page 1 of 1

Issued To: M/s Western Coalfields Limited (WCL) Pench Road, Coal Estate, Civil Lines Nagpur, 441 [illegible] (MS) [illegible]	Sample Received No. [illegible] Received Date: [illegible] Reference: -	Analysis Start [illegible] Analysis End 26.06.2025 Sample Category Water

Sample Name	Sample Particulars/Details	Purpose of analysis	Quantity Received
Water	Water (Ref. No. - [illegible] North Area)	Drinking	2 Ltr

Sample Collected By	Sampling Date / Sampling Time	Sampling Location
Mr. Mukesh Nakade	13.05.2025 Not Mentioned	Gadchiroli

Tests Required: Appearance, Colour, Odour, Chloride, Chlorine Residual, Fluoride, Magnesium, Nitrate, Odour, pH, Sulphate, TDS, Turbidity, Total Hardness, Alkalinity, Aluminium, Boron, Copper, Cadmium, Iron, Lead, Manganese, Mercury, Selenium, Total Chromium, Zinc

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirements as per IS 10500 : 2012 Drinking Water Specification Including Amendment No. 1		Test Results
				Acceptable Limit	Permissible Limit	
I	**Physical Testing: Water**					
1	Alkalinity	mg/l	IS 3025(Part 23) : 1986	200	600	327.65
2	Colour	Hazen	IS 3025(Part 4) : 2021	5	15	1
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) 1988	250	1000	[illegible]
4	Chlorine (as Cl2)	mg/l	IS 3025 (Part 26) : 1986	25	200	[illegible]
5	Residual Chlorine	mg/l	IS 3025 (Part 26) : 2021	0.2	-	BDL (DL - 0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	[illegible]
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	[illegible]
8	Nitrate (as NO3)	mg/l	APHA (Online Method Manual) 2017	45	No relaxation	[illegible]
9	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11) : 2022	6.5 to 8.5	No relaxation	[illegible]
11	Sulphate (as SO4)	mg/l	IS 3025 (Part 24) : 2022	200	400	[illegible]
12	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	[illegible]
13	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	[illegible]
14	Total Hardness (as CaCO3)	mg/l	IS 3025 (Part 21) : 2009	200	600	[illegible]
II	**Chemical Testing: 2. Residues in Water**					
15	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 2022	0.01	No relaxation	BDL (DL - 0.01)
16	Aluminium (as Al)	mg/l	IS 3025 (Part 2) : 2019	0.03	0.2	BDL (DL - 0.03)
17	Boron	mg/l	IS 3025 (Part 2) : 2019	0.5	2.4	BDL (DL - 0.1)
18	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	BDL (DL - 0.01)
19	Cadmium (as Cd)	mg/l	IS 3025 (Part 2) : 2019	0.003	No relaxation	BDL (DL - 0.003)
20	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	1.0	No relaxation	[illegible]
21	Lead (as Pb)	mg/l	IS 3025 (Part 2) : 2019	0.01	No relaxation	BDL (DL - 0.001)
22	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	0.11
23	Mercury (as Hg)	mg/l	IS 3025 (Part 2) : 2019	0.001	No relaxation	BDL (DL - 0.001)
24	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2018	0.01	No relaxation	BDL (DL - 0.001)
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation	BDL (DL - 0.001)
26	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	BDL (DL - 0.1)

Note: [illegible]

REMARKS: [illegible]

Verified By

Mukesh Parde
Technical Manager

Sachin Rao
Deputy Technical Manager

Authorised Signatory

Deepak Gandre
Deputy Quality Manager

Anacon Laboratories Pvt. Ltd. Nagpur Lab
[illegible]

Anacon Laboratories

ISO 9001

Test Report

UID No.: [illegible]

Test Report No.: [illegible]

Dated: [illegible]

Page 1 of 1

Issued To: M/s Western Coal [illegible] Limited (WCL) [illegible] Road, Coal [illegible] Nagpur, MCL [illegible]	Sample Received No.: [illegible] Received Date: [illegible] Reference: -	Analysis Start: [illegible] Analysis End: [illegible] Sample Category: Water
Sample Source: Water	Sample Particulars Details: Bright Well No.: [illegible]	Purpose of analysis: Drinking Quantity Received: 1 Ltr
Sample Collected By: Mr. Mukesh Mohite	Sampling Date: [illegible] Sampling Time: Not Mentioned	Sampling Location: Gondia City

Tests Requested: Alkalinity, Colour, [illegible] Chloride, Fluoride, Magnesium, Nitrate, Odour, pH, Sulphate, TDS, Total Hardness, Total Alkalinity, [illegible]

Test Results:

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500: 2012 (Drinking Water Specifications) Acceptable Limit	Permissible Limit	Test Result
I	Chemical Testing: Water					
1	Alkalinity	mg/l	IS 3025 (Part 23): 1986	200	600	[illegible]
2	Colour	Hazen	IS 3025 (Part 4): 2021	5	15	1
3	Chloride (as Cl)	mg/l	IS 4905 (Part 32): 1988	250	1000	[illegible]
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40): 1991	75	200	[illegible]
5	Fluoride / Silicate	mg/l	IS 3025 (Part 60): 2021	1	1.5	[illegible]
6	Fluoride (as F)	mg/l	IS 3025 (Part 60): 2021	1.0	1	[illegible]
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46): 1994	30	100	[illegible]
8	Nitrate (as NO3)	mg/l	APHA method (23rd edition, 2017)	45	No relaxation	[illegible]
9	Odour	-	IS 3025 (Part 5): 2018	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11): 2022	6.5 to 8.5	No relaxation	[illegible]
11	Sulphate (as SO4)	mg/l	IS 3025 (Part 24): 2022	200	400	[illegible]
12	Total Dissolved Solids	mg/l	IS 3025 (Part 16): 1984	500	2000	[illegible]
13	Turbidity	NTU	IS 3025 (Part 10): 1984	1	5	[illegible]
14	Total Hardness (as CaCO3)	mg/l	IS 3025 (Part 21): 2009	200	600	[illegible]
II	Chemical Testing: Residues in Water					
15	Arsenic (as As)	mg/l	IS 3025 (Part 37): 2022	0.01	No relaxation	[illegible]
16	Aluminium (as Al)	mg/l	IS 3025 (Part 2): 2019	0.03	0.2	[illegible]
17	Boron	mg/l	IS 3025 (Part 1): 2019	0.5	2.4	[illegible]
18	Copper (as Cu)	mg/l	IS 3025 (Part 42): 2019	0.05	1.5	[illegible]
19	Cadmium (as Cd)	mg/l	IS 3025 (Part 41): 2019	0.003	No relaxation	[illegible]
20	Iron (as Fe)	mg/l	IS 3025 (Part 53): 2019	1.0	No relaxation	0.03
21	Lead (as Pb)	mg/l	IS 3025 (Part 47): 2019	0.01	No relaxation	[illegible]
22	Manganese (as Mn)	mg/l	IS 3025 (Part 59): 2019	0.1	No relaxation	[illegible]
23	Mercury (as Hg)	mg/l	IS 3025 (Part 48): 2019	0.001	0.2	0.27
24	Nickel (as Ni)	mg/l	IS 3025 (Part 54): 2019	0.02	No relaxation	[illegible]
25	Total Chromium (as Cr)	mg/l	IS 3025 (Part 52): 2019	0.05	No relaxation	[illegible]
26	Zinc (as Zn)	mg/l	IS 3025 (Part 86): 2019	5	15	[illegible]

NOTE: [illegible]

REMARKS: [illegible]

Verified By:

Manjeet Pande
Technical Manager

Sohail Raza
Deputy Technical Manager

Authorized Signatory

[illegible]
Deputy Quality Manager

—END OF REPORT—

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[illegible] Road, Nagpur, Maharashtra, India - 441 122
[illegible]

Anacon Laboratories

TC 5653

Test Report

ULR No. - [illegible]
Test Report No: [illegible]

Date: [illegible]
Page 1 of 1

Issued To: M/s Western Coalfields Limited (WCL) Pench Road, Civil Lines, Civil Lines Nagpur, MS, IN (MS), 440001	Sample Received No. [illegible] Received Date [illegible] Reference -	Analysis Start [illegible] Analysis End [illegible] Sample Category Water

Sample Name	Sample Particulars/Details	Purpose of Analysis	Quantity Received
Water	Water (Well No. - [illegible]) (West North Area)	Drinking	1 Ltr
Sample Collected By	**Sampling Date**	**Sampling Location**	
Mr. M. Rohit Mahajan	[illegible]	Site	
Sampling Time			
Not Mentioned			

Tests Requested: Colourless, Colour, Chloride, Calcium, Residue on Evaporation, Fluoride, Magnesium, Nitrate, Nitrite, Sulphate, TDS, Total Ink, Total Hardness, Acidity, Alkalinity, Boron, Copper, Cyanides, Oil, Total Chromium, Total Phosphorus, Total Organic Carbon

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirements as per IS 10500:2012 (Drinking Water Specifications) Acceptable Limit	Permissible Limit	Test Result
1	Chemical Testing Of Water					
2	Alkalinity	CaCO3	IS 3025 (Part 23) : 1986	200	600	50.33
3	Colour	Hazen	IS 3025 (Part 4) : 2021	5	15	[illegible]
4	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	19.30
5	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	10.2
6	Residual Chlorine	mg/l	IS 3025 (Part 26) : 2022	0.2	1	BDL (DL - 0.1)
7	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	0.01
8	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	22.57
9	Nitrate (as NO3)	mg/l	APHA Standard Methods 22nd Ed.	45	No relaxation	8.67
10	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
11	pH	-	IS 3025 (Part 11) : 2022	6.5 to 8.5	No relaxation	7.61
12	Sulphate (as SO4)	mg/l	IS 3025 (Part 24) : 2022	200	400	11.97
13	Total Dissolved Solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	198
14	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.3
15	Total Hardness (as CaCO3)	mg/l	IS 3025 (Part 21) : 2009	200	600	328
II	Chemical Testing Of Heavy Metals In Water					
16	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 2022	0.01	No relaxation	BDL (DL - 0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2) : 2019	0.03	0.2	BDL (DL - 0.01)
18	Boron	mg/l	IS 3025 (Part 2) : 2019	0.5	2.4	BDL (DL - 0.1)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	BDL (DL - 0.01)
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2) : 2019	0.003	No relaxation	BDL (DL - 0.003)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	1.0	No relaxation	0.21
22	Lead (as Pb)	mg/l	IS 3025 (Part 2) : 2019	0.01	No relaxation	BDL (DL - 0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	0.04
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2) : 2019	0.02	No relaxation	BDL (DL - 0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 56) : 2003	0.01	No relaxation	BDL (DL - 0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation	BDL (DL - 0.01)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	BDL (DL - 0.1)

NOTE: [illegible]

REMARKS: Incorporated in the chart, samples were tested for above parameters only. As per IS 10500 [illegible] 1.4.1 IS 1.4.3 samples [illegible] only. However the results are [illegible] indicating that with respect to the tested parameters it can be used for drinking purposes [illegible]

Verified By

Manjusha Pawar
Technical Manager

[illegible]
Deputy Technical Manager

Authorised Signatory

[illegible]
Deputy Quality Manager

END OF REPORT

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Anacon Laboratories Pvt. Ltd. Nagpur Lab
[illegible], M Pool Park, Civil Star Industrial Estate, MIDC Butibori, Nagpur, Maharashtra, India - 441 122
[illegible] Email: info@anacon.in
Website: www.anaconlaboratories.com

Photographs of Catch Drain

Surface Run-off

Adequate numbers of vegetation will be grown on the top surface and slopes of the dumps in order to arrest the erosion of soil and it will also reduce surface run-off, which helps averting siltation of natural water courses. Catch drains has been constructed for surface run-off along haul road and other mine roads.

Catch Drain along Haul Road

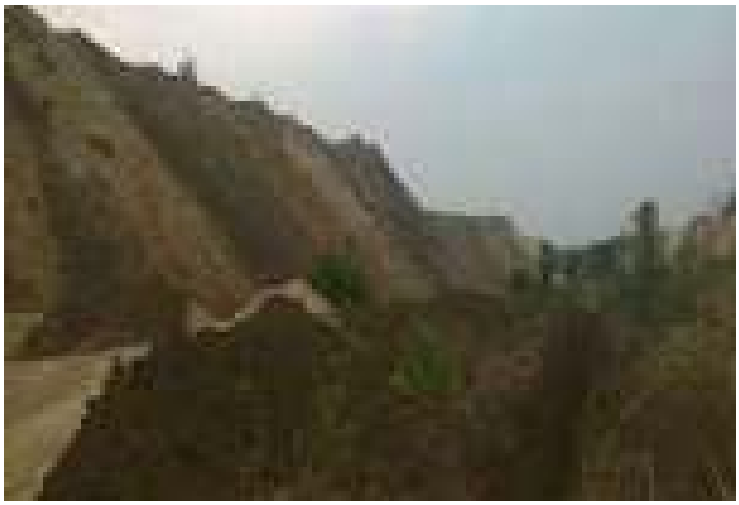
Catch Drain along Haul Road

Photographs of Garland Drain

Surface Run-off

Adequate numbers of vegetation will be grown on the top surface and slopes of the dumps in order to arrest the erosion of soil and it will also reduce surface run-off, which helps averting siltation of natural water courses. Garland drains has been constructed for surface run-off around mine, embankment and dumps.

Garland Drain along Embankment



Garland Drain along OB Dump

Photographs of Garland Drain

Garland Drain along OB Dump

Garland Drain along Embankment

In Compliance of condition No.4.C(xi) of EC granted by MoEF&CC vide no.J-11015/ 25/ 2008-IA-II (M) dated 01.01.2021. Production Capacity 3.00 MTPA in an area of 706.28 ha

Expansion of New Majri UG to OC

Tehsil- Bhadravati, District- Chandrapur
Maharashtra (Majri Area, WCL)

JULY- 2021

PREPARED BY

Western Coalfields Limited,
Nagpur, Maharashtra.

Contents

Chapter 1

INTRODUCTION

1.1 Identification of Project and Project Proponent General Aquifer Parameters

Expansion of New Majri UG to OC project is a Opencast Coal mine of Western Coalfields Limited (WCL) Majri Area, located in Bhadravati Tehsil, Chandrapur District, Maharashtra State. This is an operating coal mine with a production capacity of 3.0 Million Tonne Per Annum (MTPA) in total area of 706.28 Ha. Project Proponent WESTERN COALFIELDS LIMITED is a subsidiary company of COAL INDIA LIMITED (CIL), which is under administrative control of MINISTRY OF COAL, GOVERNMENT OF INDIA.

1.2 Introduction

The Expansion of New Majri UG to OC has obtained Environmental Clearance for for production capacity of 3.0 MTPA in an area of 706.28 ha vide MoEF & CC letter no. J-11015/25/2008-IA-II (M) dated 01.01.2021.

The the Project Report (Including Mining Plan & Mine Closure Plan) for production capacity of 3.00 MTPA (Normative) and 3.75 MTPA (Peak) within ML area of 706.28

ha was prepared and approved by WCL Board in its 311st meeting held on 25.05.2019 vide letter WCL/BD/SECTT/BM-311/2019/539 dated 07.06.2019.

Total geological reserves in the mine lease area is 78.62 MT with 67.65 Mt mineable reserves. Extractable reserves are 57.85 Mt. Percent of extraction is 73.58 % with a maximum depth of 150.0 m.

1.3 Location & Communication

The New Majri UG to OC Expansion mine is located in Majri Area of WCL in Chandrapur district of Maharashtra state. This is an operating mine with the capacity of 3.0 MTPA and land area of 706.28 Ha having EC issued vide ref no. J-11015/25/2008-IA.II (M) dated 01.01.2021.

The area is at a distance of about 140 km from Nagpur via Warora. The Majri railway station, within the area is located about 17 km from Warora railway station on the Wardha – Kazipeth main branch of Central Railway. The Majri-Wani branch line passes through the central part of New Majri Colliery separating New Majri UG to OC mine in northern side from New Majri Sector-IA & IIA Extension OC in southern side. National Highway-930 passes along the northern boundary of the project connecting Warora and Wani town.

Many coal mines (New Majri Sector-IA and IIA OC, Navin Kunada OC, Kolar Pimpri OC etc) are located in south of the project.

The area of New Majri UG to OC expansion mine is bounded by latitudes N 20°06'45.43" to 20°08'43.08" and Longitude E 79°00'13.53" to 79°01'59.9". The block is covered in the Survey of India Toposheet No.- 55 P/4.

Toposheet plan showing the project area is given below.

1.4 Topography & Drainage

The characteristic land pattern of project area is a north-south trending raised ground between the altitudes 185 m to 194 m. The western part of this raised ground slopes into Wardha River. The HFL of Wardha River is reported to be 193.65 m as observed in 1994 in New Majri Colliery area with reference to the assumed RL of Bench Mark of the colliery. The Wardha River flows along the mine boundary in south-west of the project. A minimum distance of 175 meter has been kept from the quarry surface of the mine. An embankment with height of 6 meter above HFL will be constructed between quarry and the Wardha River. A minimum safety distance of 45 meter from Embankment to Wardha River has been proposed in the approved Project Report.

Location	Minimum Distance from Wardha River (in meters)
Mine Boundary	0
Embankment	45
Quarry Surface	175
External Dump	2100

The Koradi nala with its branches and gullies used to pass through the eastern part of project area and it joins Shirna nala further to the east. The Koradi nallah has been diverted for the existing project (1.20 MTPA) along the mine boundary and now joins the Shirna Nallah a kilometer before its earlier confluence point.

Figure Plan showing Diverted Route of Nallah on Google Earth Imagery

The Koradi nallah was diverted to the Shirna nallah in accordance with the design received vide note no. CDO/DAM/ED-2/14/2016 date 31.03.2016 from the office of Superintending Engineer (DAM), Design Circle, Central Design Organization, Nashik of Government of Maharashtra (Water Resource Department). The report is attached as Annexure- XVIII.

The HFL of Koradi nala & Shirna nala is reported to be 192.45 m. The entire up-dip side of the project area i.e. the quarriable zone is under the HFL because of these nallahs flowing through the area. The topography in this part varies between 185 m to 190 m. The present expansion of existing New Majri UG to OC (3.00 MTPA) does not require diversion of any Nallah/River.

1.5 Mine Boundary

The geological block boundaries of block are as follows:

North	-	F_6-F_6 Boundary fault & Naglone – Patala Road
South	-	Railway Line
East	-	Subcrop of Composite Seam
West	-	Wardha River

The mine boundary of the New Majri UG to OC Expansion mine are as follows:

East (Rise side)	: **Subcrop of Composite Seam**
West (Dip side)	: At about 250 m Depth line
North	: Fault F_6 – F_6 Boundary fault and upto 85 m away from the road connecting Naglone village to Patala village
South	: Safety distance of 100 m from surface Infrastructures and railway line

1.6 Geological Structure

Strike & Dip

Overall Strike is NW-SE with a strike length of approx. 2.8 km. The bed dips towards SW throughout the Block. The gradient ranges from 1 in 4.6 in Northern part to 1 in 4.8 in the Southern part.

Faults

Details of 3 faults encountered in the area considered are provided in Table below:

Table 1 Details of Faults

Sl No.	Fault No.	Strike of fault	Amount and Direction of throw	Linear Extension (approx.)	Nature and Evidence
1	F6-F6 (Boundary Fault)	Almost NW-SE	150m towards SW	1.4km	1. Oblique fault. 2. Evidence of Talchir Formation at depth of 29.65 m & 39.85 m at CMWN-08 & 04 respectively against existence of coal seams at
2	F6A-F6A	Almost E-W	About 0 to 20m towards N	0.405 Kms	1. Strike/Oblique fault. 2. Absence of Composite seam in B.H.No CMWNM-89 &91 3. Part thickness of Composite Seam due to faulted floor in CMWNM-90 4. Difference in FRL values of B.H.No. CMWKH-209 on the Downthrown side
3	FF-FF	Almost NW-SE	About 0m to 5m towards SW	0.293 km	1. Strike fault 2. Difference in Floor contour level between CMWN-07 & 19

1.7 Mining Technology

Method of Mining will be Opencast with Shovel – Dumper Combination.

Geo-Mining parameters of Expansion of New Majri UG to OC mine

Sl. No.	Particular	Qty.
1.	Area of the Quarry	
a)	On floor (ha)	235.03
b)	On surface (ha)	358.35
2.	Depth (m)	
a)	Initial	52
b)	Final	250
3.	Gradient of Seam	1 in 4.6 in Northern part to 1 in 4.8 in Southern part
4.	Average thickness range of seams (m)	12.88 to 18.89
5.	Average Strike length (m)	2163
6.	Width on surface (m) [dip rise]	1316
7.	Width on floor (m) [dip rise]	1073
8.	Grade and GCV (kCal/kg) (0.05m dilution at each contact point)	'G-11' (GCV-4115)
9.	Mineable Reserves (Mt) as on 01.04.2018	36.09
10.	Total OB (Mm^3)	383.49 Mm^3
11.	Additional OB to be generated as on 01.04.2018 (Mm^3)	373.18 Mm^3
12.	Average stripping ratio (m^3/t)	10.34

1.8 Land Requirement

The land requirement use details of the project is as follows:

Sl. No.	Particulars	Tenancy land (ha)	Govt. Land (ha)	Forest Land (ha)	Total Land (ha)
1	Land required for existing New Majri UG to OC mine	460.21	18.95	Nil	**479.16**
2	Addl. Land to be acquired for Expansion of the mine	220.30	6.82	Nil	**227.12**
Total Land involved in the New Majri UG to OC Expansion mine		**680.51**	**25.77**	**Nil**	**706.28**

1.9 Genesis of the Study

Environmental Clearance for Expansion of New Majri UG to OC has been secured for production capacity of 3.0 MTPA in an area of 706.28 ha vide MoEF & CC letter no. J-11015/25/2008-IA-II (M) dated 01.01.2021.

As per EC Condition no. 4.1c(xi) at pg 11 of aforesaid EC letter," Project proponent shall take all precautionary measures to ensure riverine/ reparian ecosystem in and around mine upto a distance of 5 km. A riverine/ reparian ecosystem conservation and management plan should be prepared and implemented in consultation with irrigation/ water resource department in the state government "

In compliance of the aforesaid EC condition, Western Coalfields Limited has prepared riverine/ reparian ecosystem conservation and management plan and also suggested all precautionary measures to ensure riverine/ reparian ecosystem in and around mine.
Subsequently, steps will be taken so as to implement the aforesaid measures / plan in consultation with Irrigation/ Water resource department in the state government.

The Detail analysis report/ plan/ suggestions are being placed in subsequent pages.

1.10 Geology of the Area

Regional Geology
Wardha Valley Coalfield is located in the southeastern part of Maharashtra State between Latitude N-19^{0}30' & 20^0 27' and Longitude E-78^0 50' & 79^{0}49'. The aerial extent of this coalfield has been estimated as 4000 sq.km. The NNW-SSE axis (which corresponds to the strike of the coal bearing sedimentaries) is around 100 km long with a maximum width of about 80 km. The like hood of extension of this coalfield in the north-northwestwards beneath the Deccan Trap cannot be discounted.
The coalfield has elliptically aligned coal prospects within Barakar Formation around the core of Talchirs, which occupies the central part of the coalfield. The eastern limits of this anticlinal structure is constituted by Konda/Bhandak blocks towards north and Wirur/Subai/Chincholi blocks towards south. The western limb is constituted by Majri/Kawadi/Kolarpimpri blocks toward north and Ghugus/Nakoda/mugoli/Kolgaon-Sawangi towards south. These limbs have been further affected by numerous NNW-

SSE trending faults. Depending upon the alignment of these faults vis-à-vis the strike of coal bearing sedimentaries, numerous isolates coal-prospects have been deciphered in western limit of Wardha Valley Coalfield.

The Archaeans are exposed in the low-lying area in the eastern part of coalfield. The Pre-cambrian sediments, Sullavai sandstone and Pakhal Limestones encircle the Gondwana sediments in the south west and north-east while the flows of Deccan Trap conceal the underlying Gondwana sediments in the northwest.

The Talchir formation conspicuously occupies the central part with a maximum width of 21 km and length of 24 km. The coal bearing Barakar Formation conformably overlies the Talchirs. Few exposures of it in the form of narrow linear strips occur in the western part of the coalfields is given in the Table 1.

Table : Regional Geological Succession of Wardha Valley Coalfield

Age	Formation	Lithology
Recent to Sub-recent	Detrital mantle	Black cotton soil, sandysoil, kankar etc.
Upper Cretaceous to Eocene	Deccan Trap	Basalts
----------Cretaceous	--UNCOFORMITY----- Lametas	---------- Cherty limestone, Silicified sandstone.
Upper Permian to Lower Triassic	--UNCONFORMITY--- Kamthis	---------- Red, brown, medium to coarse grained sandstone, variegated clay and shale band.
……..	UNCONFORMITY Barakar	…….
Lower Permian	Talchir	Predominantly grey to white medium to coarse grained sandstone with minor shales, carbonaceous shale and one thick coal seam (15 to 25m)
Lower Permian-upper Carboniferrous.	--UNCONFORMITY-- Sullavai	Greenish to grey coloured sandstone, siltstones and shales.
---------- Precambrian	Pakhal	---------- ---

---------- Archaean	--UNCONFORMITY-- Metamorphics	White to light brown quartzitic sandstone, conglomerates. Grey, bluish or pinkish limestone and Cherts ---------- Gneisses or schists

Chapter 2

HYDROGEOLOGICAL SETUP

2.0 Hydrogeology

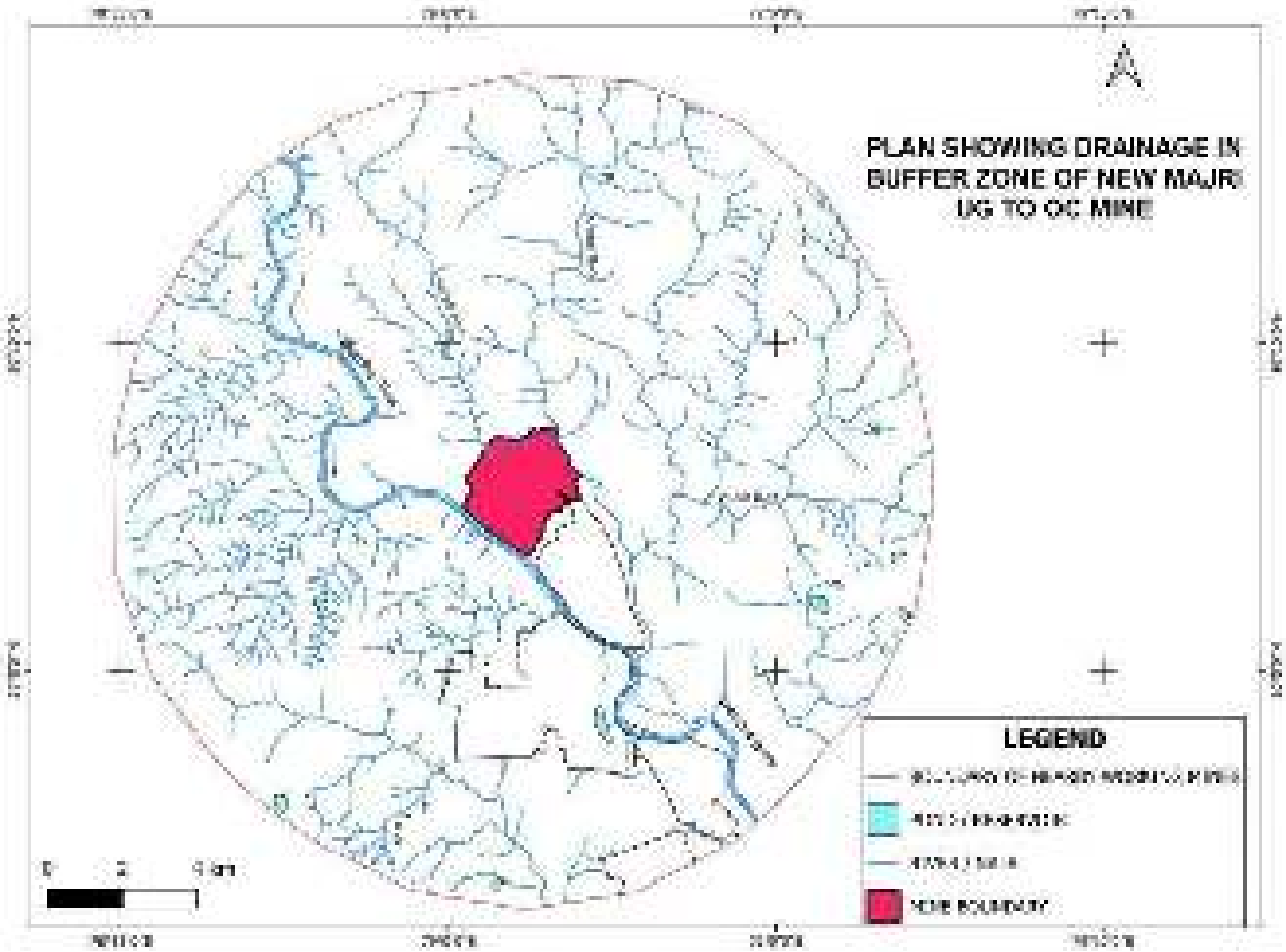
The Expansion of New Majri UG to OC is situated in Wardha Valley coalfields of WCL. The ground water assessment carried out in the Wardha Valley coalfield is provided in this chapter.

2.1 Topography & Drainage

The considered area has gentle topography. The maximum and minimum elevations of the area under consideration are 194 m and 185 m above M.S.L. respectively.

The main drainage of the area is controlled by south easterly flowing Wardha River. Wardha River flows adjacent to the south west boundary of the mine. South Easterly flowing Shirnai nadi flows adjacent to the North Eastern and Eastern side of the mine boundary. Diverted Koradi Nala passes within the mine boundary near to the northern side of the mine. H.F.L (observed in 1994) of the Wardha River is 193.65m above MSL in the region. The HFL of Koradi nala & Shirna nadi is reported to be 192.45 m above MSL. Embankment is proposed along the quarry boundary would be 6m high above the HFL. The distance between the toe of the embankment and the Wardha River would be about (approx.) 50 m to 100 m and its distance with the Koradi nala is about 10-30 m.

Morphometric analysis of Micro-Watershed of Koradi Nala and Shirnai Nadi (part of Shirnai nadi before it joins Konda nala). Drainage plan of the buffer zone of mine (10km radius) and location of the micro-watersheds is shown below:


PLAN SHOWING DRAINAGE IN
BUFFER ZONE OF NEW MAJRI
UG TO OC MINE
LEGEND

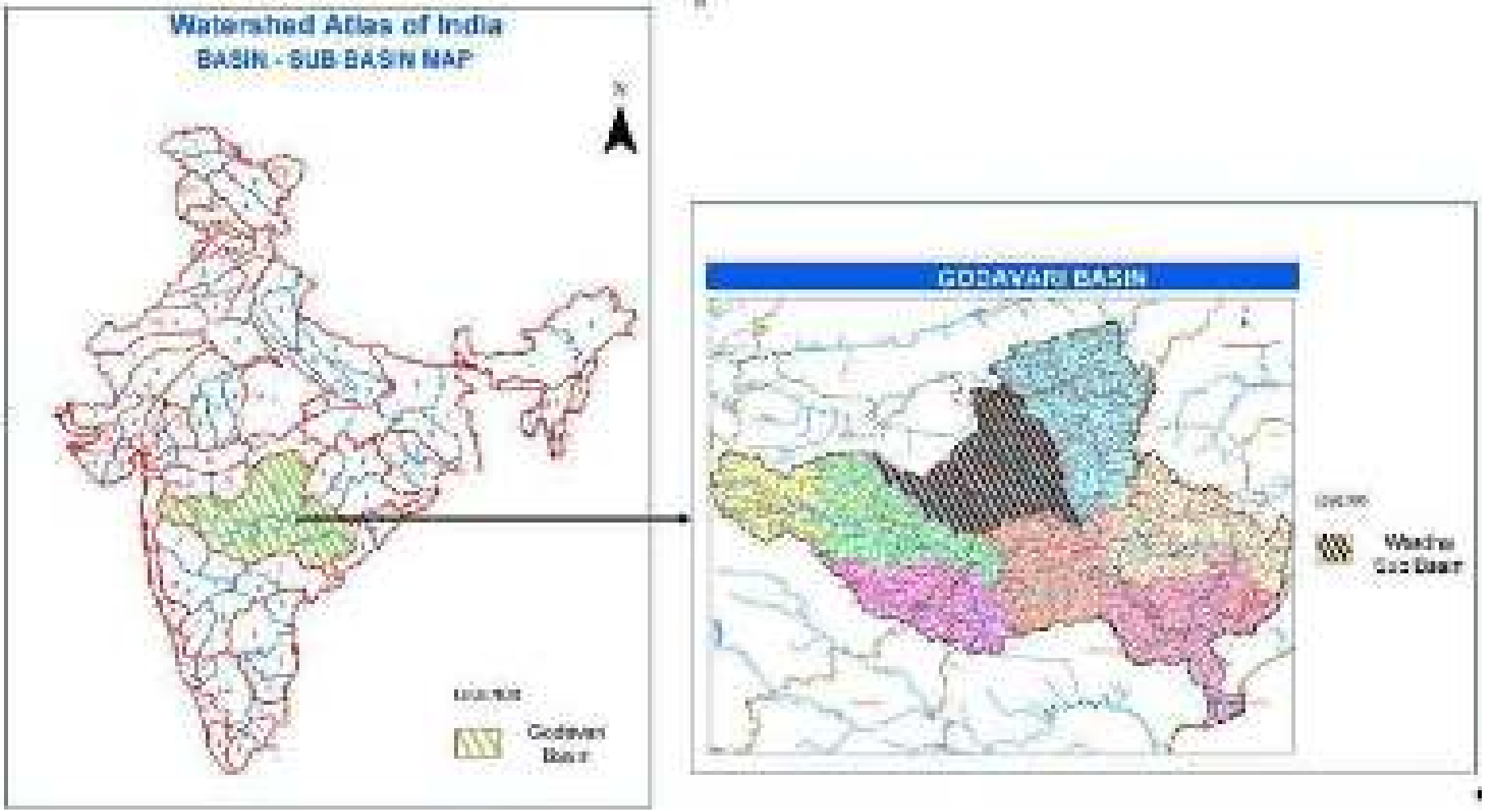


Figure: Basin and Sub-Basin in which the mine is located

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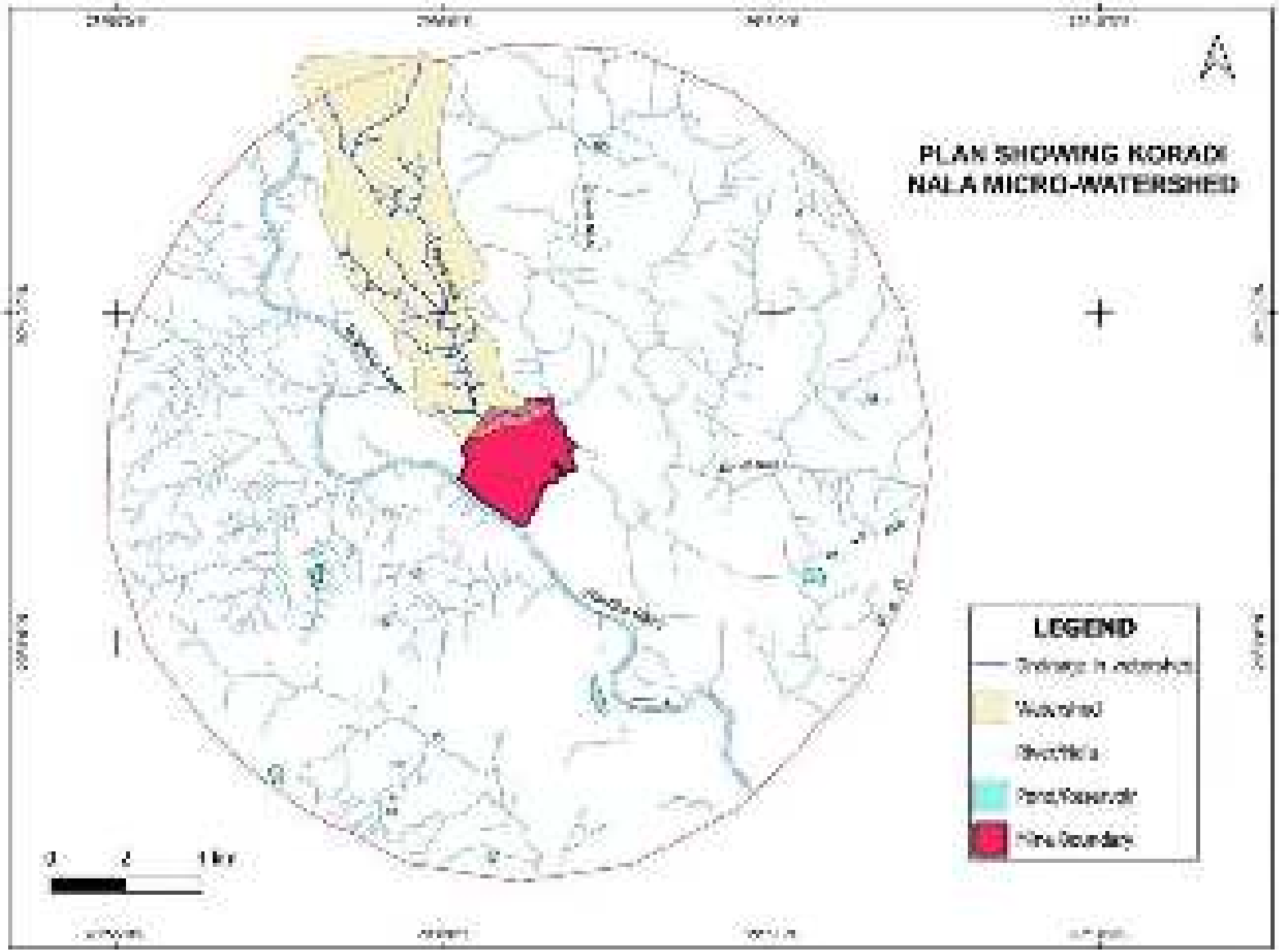

Figure Koradi Nala Micro-Watershed

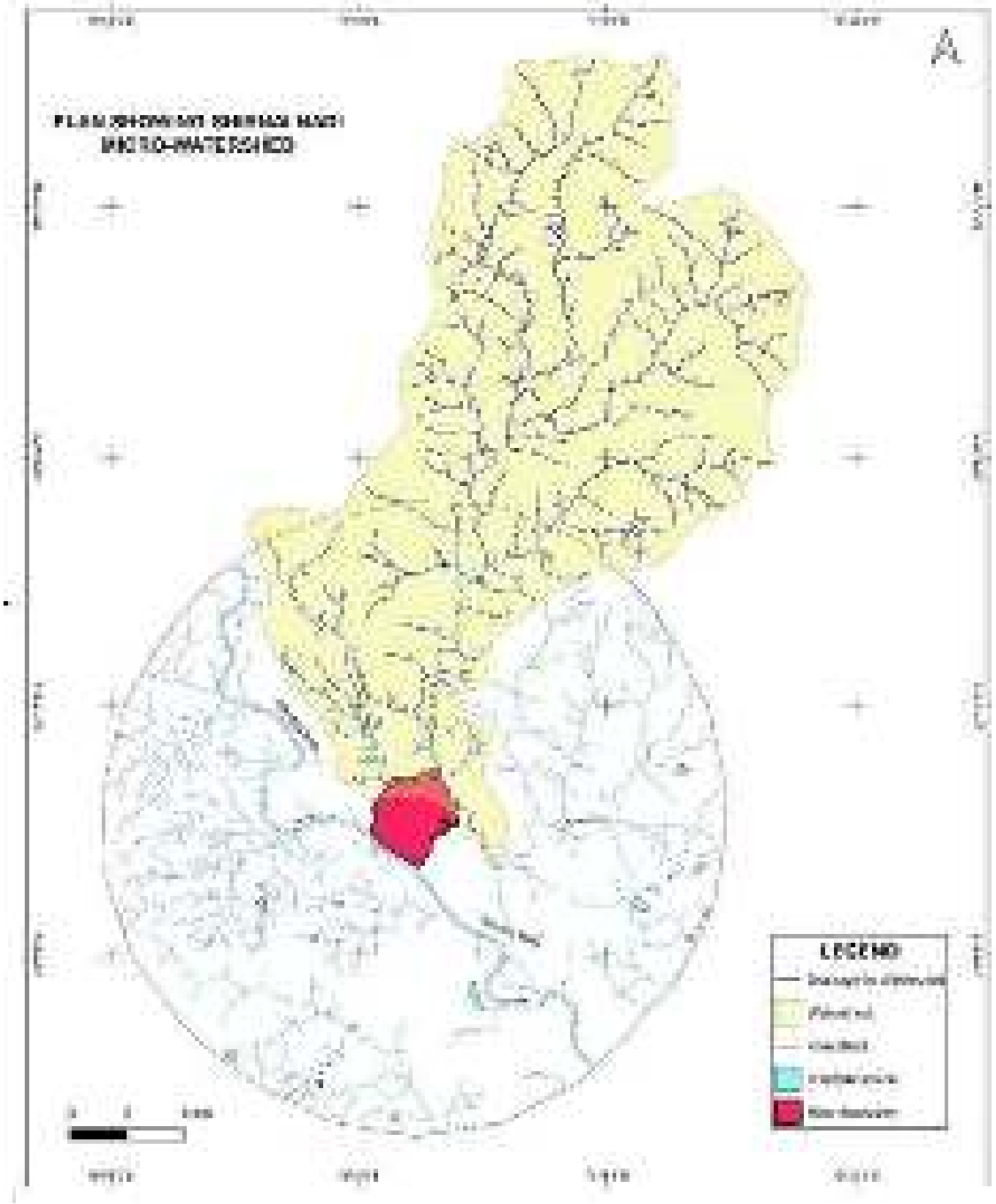

Figure Shirnai Nadi Micro-Watershed

Part of Mine lease hold area of New Majri UG to OC mine comes under the watersheds of Koradi Nala and Shirnai nadi at the downstream part of both watersheds. Only about 0.97 sq.km and 2.098 sq. km of the Koradi nala and Shirnai nadi watersheds intersects the concerned mine leasehold area respectively. However the total area of Koradi nala and Shirnai nadi watersheds is about 33.07 sq.km and 278.58 sq.km respectively. Hence mine leasehold area that lie within the Koradi Nala and Shirnai Nadi micro-watershed area constitutes only 2.93% and 0.75% of the respective micro-watersheds. Basic morphometric analysis of the two micro watersheds is given below:

Table : Basic morphometric analysis of the Koradi Nala micro water shed

Micro Watershed	Attributes	Stream Order		
		I	II	III
Koradi Nala	Number of streams	23	3	1
	Stream length (km)	19.62	7.20	9.54
	Cumulative stream length (km)	19.62	26.82	36.36
	Mean Stream Length (km)	0.85	2.40	9.54
	Bifurcation Ratio	7.67	3	
	Mean Bifurcation Ratio	5.34		
	Area (sq.km)	33.07		
	Stream Frequency	0.82		
	Drainage Density	1.10		

Table : Basic morphometric analysis of the Shirnai Nadi micro water shed

Micro Watershed	Attributes	Stream Order				
		I	II	III	IV	V
Shirnai Nadi	Number of streams	146	29	8	3	1
	Stream length (km)	179.66	54.34	54.41	12.59	14.56
	Cumulative stream length (km)	179.66	234.00	288.41	301.00	315.56
	Mean Stream Length (km)	1.23	1.87	6.80	4.20	14.56
	Bifurcation Ratio	5.03	3.62	2.67	3	

	Mean Bifurcation Ratio	3.77
	Area (sq.km)	278.58
	Stream Frequency	0.67
	Drainage Density	1.13

2.2 Aquifers

The geology of the area in and around New Majri UG to OC mine consists of alluvium, Kamthis, Mot and Barakar. Broadly the aquifers can be classified as shallow and deeper aquifers. Shallow aquifers includes Soil/Alluvium and Kamthi formation whereas deeper aquifer system consists of Motur and coal bearing Barakar formation. The groundwater potential of Shallow aquifer is generally moderate to high in Alluvium/Kamthis as compared to deeper. Groundwater from the above mentioned aquifers is harnessed through shallow / deep tube wells. The types of aquifers are given in the table below.

Table : Type of aquifers in New Majri UG to OC Mine area

Hydrogeological unit		Formation	Thickness (m)
Shallow Aquifer	Unconfined aquifer	Soil/Alluvium	1 – 22.85
	Unconfined / Semi-Confined aquifer	Kamthi	5.51-33.65
Deeper Aquifer	Semi confined	Motur	54.20 – 80.15-
	Semi confined / Confined Aquifer	Barakar Formation above Coal Seam	upto 141.55
	Aquiclude	Composite Coal Seam	12.88 – 18.89

2.3 Groundwater Level

To collect the representative groundwater levels in the study area, WCL through CMPDI, RI-IV has established a monitoring network with 16 number of hydrograph stations spread over the buffer zone (10 km radius from the New Majri UG to OC mine). Water level monitoring in these hydrograph stations has been done as per MoEF&CC guidelines (four times in a year). Groundwater levels from 2015 to 2019 is placed below:

Table : Groundwater monitoring data of dugwells in Indl. Estate of Engineering/Non Metal III TGE/Non Metal V TG/ Non OC / Night Area, PCL

Well No.	Name of Units	Parameters	Dugwells (Above GL) Water Quality Levels															
			Pre'14	Aug'14	Pre'15	Jan'15	May'15	Aug'15	Nov'15	Jan'16	May'16	Aug'16	Nov'16	Jan'17	Pre'17	Aug'17	Pre'17	Jan'18
M1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M4B	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M4B	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M7Ba	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]					
M9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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M12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M12A	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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A/NW SOUTH																		
A/NW	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
A/NW	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
PRODUCTION																		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

The range of water levels for the year 2018, measured from the area in and around New Majri UG to OC Area for pre-monsoon and post-monsoon periods are given as follows:

Table Depth to Water Level Range in buffer zone of New Majri UG to OC Mine

Pre monsoon period May-June	Buffer zone (within 10 km)	2.85 m to 10.85 m
	Core Zone (within 3 Km)	7.70 m to 7.85 m
Post monsoon period Oct-Nov	Buffer zone	1.15 m to 10.45 m
	Core Zone	1.15 m to 4.55 m

Table Water level Fluctuation in buffer zone of New Majri UG to OC Mine (m bgl)

Year	Min	Max	Average
2012	1.04	4.93	3.02
2013	1.60	5.25	3.52
2014	0.00	1.90	0.89
2015	0.35	3.00	1.51
2016	0.30	4.40	1.70
2017	0.15	4.50	1.61
2018	0.40	3.10	2.00

The ground water level monitoring data of observation wells in the buffer zone of New Majri UG to OC Mine for pre- monsoon and post-monsoon periods from 2015 to 2019 are presented in the previous sections.

2.4 Water Level Trend

To assess the water level trend hydrographs of two permanent observation wells fixed by WCL through CMPDI, RI-IV has been prepared based on pre-monsoon (May) and post-monsoon (Nov) water level data along with the annual rainfall (mm) of Bhadravati Tehsil from 2008 to 2017 as presented in **fig.1 & fig.2**.

The hydrograph of well M-14b in Majri village shows decreasing water level trends during both pre-monsoon and post-monsoon period and hydrograph of well M-16b in Kondha village shows more or less steady water level trends during both pre-monsoon and post-monsoon periods.

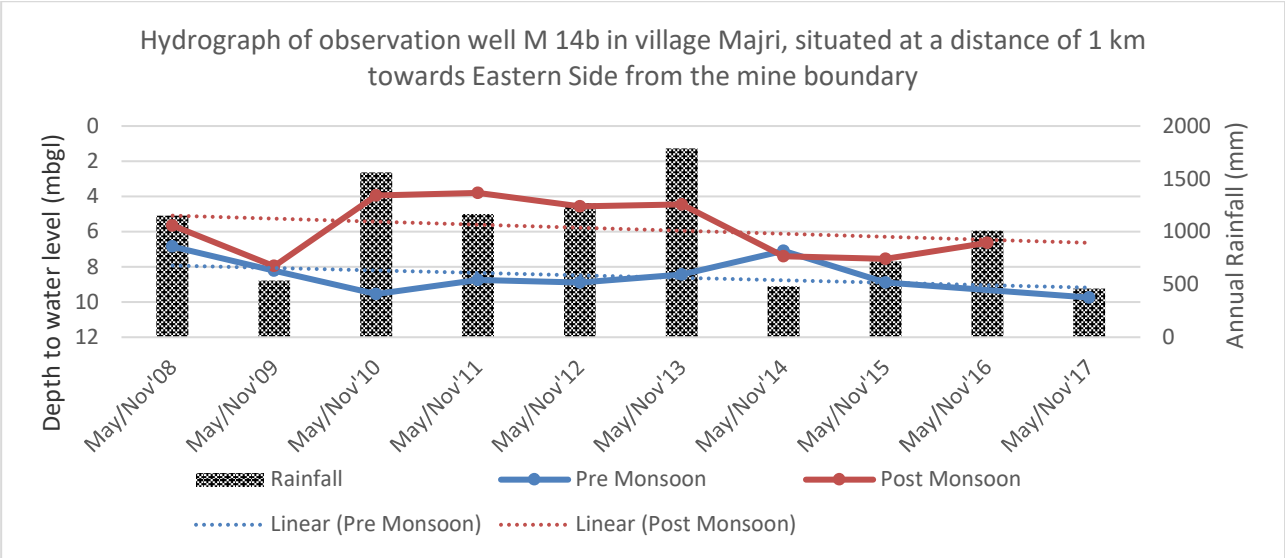


Fig.1

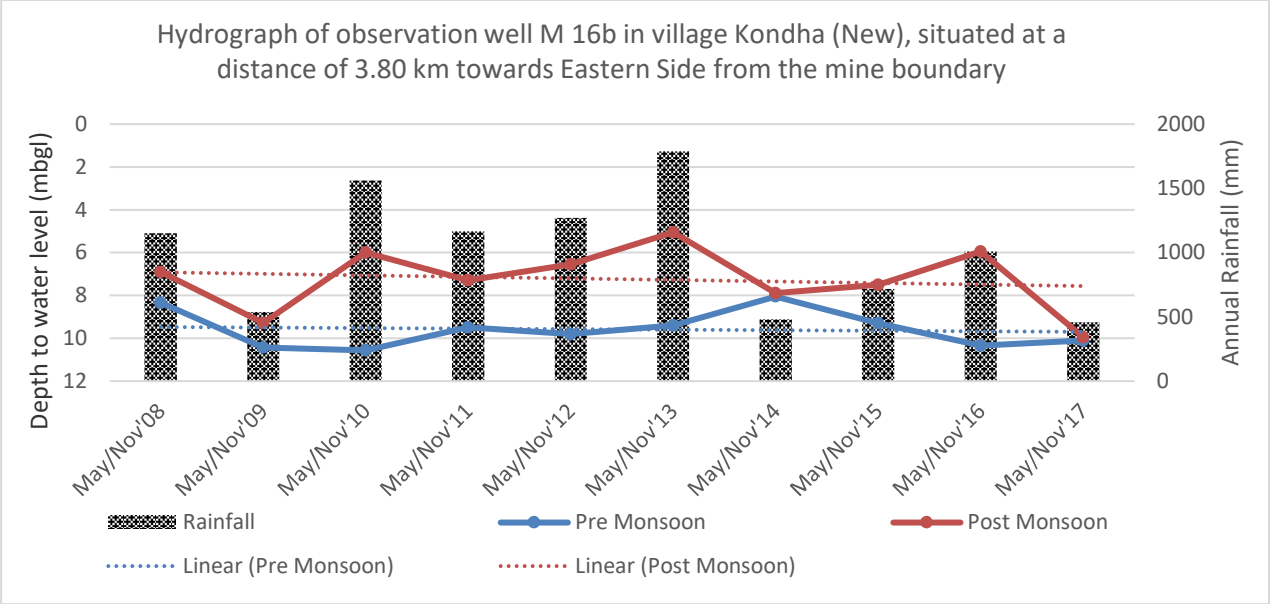


Fig.2

2.5 General Aquifer Parameters

The semi-confined/confined aquifer occurring at greater depth in Kamthis and Barakars is mostly tapped by shallow / deep tube wells. The tube wells located in the project area tapping the semi-confined aquifer in Kamthi and Upper Barakar formations down to a depth of about 100m have registered better yield ranging from 3 to 5 LPS. It may be appropriate to emphasis here that Lower Barakars overlapped directly by Kamthis is a better environment due to direct recharge / infiltration from the potential Kamthi formations.

No detailed hydrogeological investigations were carried out at New Majri UG to OC mine area. However, the aquifer parameters evaluated by CMPDI under UNDP Project at Bhadravati which is located in the eastern part of buffer zone have been considered and attributed to the study area. The projected hydraulic parameters of the aquifer in alluvium and Kamthi / Barakar formations are as follows:

Table Aquifer Parameters in the Study Area

Hydraulic conductivity (m/d)	Kamthi – 5.0 m/day Barakar – 2.0 m/day
Storage Coefficient	7.7×10^{-3} to 9.8×10^{-4}
Specific yield	0.05 – 0.025

2.6 Groundwater Resources in the Area

Ground Water Resource Estimation (As Per Gec-2015) In The Buffer Zone

The ground water resource estimation has been done by using latest methodology i.e. GEC-2015 as given below:

Ground Water Draft

The groundwater withdrawal here is generally for irrigation, domestic and Mine use and is quantified as under.

Table Gross Groundwater Draft for 'All Uses'

	GROUNDWATER DRAFT	Monsoon (120 days)	Non-monsoon (245 days)	Total
		M m^3	M m^3	M m^3
1	**Net irrigation use**			
i.	Proportional quantity for 1570 Ha area	0.00	**0.17**	**0.17**
2	**COMMUNITY USE**			
i.	Projected population (i.e. 2025 AD) = 55601	0.32	0.66	0.98
ii.	**Mine use (mine water & tubewell):**			
1	New Majri UG to OC	0.03	0.06	0.09
	New Majri II A OC	0.12	0.24	0.36
	Kolar Pimpri OC	0.10	0.20	0.30
	Junad OC	0.05	0.10	0.15
	Total	**0.30**	**0.60**	**0.90**
	Sub-Total (2(i)+2(ii))	***0.62***	***1.26***	***1.88***
3	**Net Annual Mine Discharge (M m^3)**	**Monsoon**	**Non-monsoon**	**Total**
i	New Majri UG to OC	0.51	1.05	1.56
	New Majri II A OC	0.83	1.69	2.52
	Kolar Pimpri OC	0.53	1.07	1.60
	Junad OC	0.41	0.85	1.26
Total Mine Pumping in the Area		2.28	4.66	6.94
Mine use		0.30	0.60	0.90
Total discharge after mine use		1.98	4.06	6.04
Net mine discharge in the area		**1.98**	**4.06**	**6.04**
Gross Annual Groundwater Draft for 'All uses' in Buffer Zone		***2.60***	***5.49***	***8.09***

Ground Water Recharge:

Table Rainfall Recharge in the study area by Rainfall Infiltration Method during Monsoon and Non-Monsoon Period

	Description of items		
1	**Area**		
	a. Sedimentary Area (km^2)	**314**	
	i) Alluvium/Kamthi	284	
	ii) Lametas	30	
	b. Hard Rock Area (km^2)	**-**	
	i) Basalt	-	
2	Average Rainfall (mm) during	1163.1	
	a. Monsoon season rainfall (mm) (June to Sept)	1017.5	
	b. Non-monsoon season rainfall (mm) (Oct to May)	145.6	
	c. Minimum threshold value of rainfall (mm)	116.31	
	d. Maximum threshold value of rainfall (mm)	3000	
3	Rainfall infiltration factor	Sedimentary	Hard Rock
		Alluvium/Kamthi- 0.15 Lameta – 0.06	-
4	Rainfall recharge in the study area by rainfall infiltration factor method		
	a. **Monsoon season (M m^3)** = [(1) * {(2d)-(2c)} *(3)/1000] if (2a) > (2d) = [(1) * {(2a)-(2c)} * (3)/1000] if (2a) <= (2d)	***40.01***	
	i) Sedimentary	Alluvium/ Kamthi – 38.39	
		Lameta - 1.62	
		Total – 40.01	
	ii) Hard Rock	-	
	b. **Non-monsoon season (M m^3)** = Nil if (2b) <= (2c) = [(1) * {(2b) - (2c)} * (3)/1000 if (2b) > (2c)]	***1.30***	
	i) Sedimentary	Alluvium/ Kamthi – 1.25	
		Lameta - 0.05	
		Total – 1.30	
	ii) Hard Rock	-	
	Gross Rainfall Recharge [a) + (b)]	***41.31***	

Table Rainfall Recharge in the study area by Water Table Fluctuation Method during monsoon season

	Description of items	Sedimentary	
1	Area (km^2)	Alluvium/Kamthi	Lameta
		284	30
2	Water table fluctuation (m)	2.61	1.07
3	Specific yield	0.04	0.025
4	Change in groundwater storage [(1) * (2) * (3)] (M m^3)	29.65	0.80
5	**Total (M m^3)**	***30.45***	
6	Gross groundwater extraction for 'All Uses' during monsoon season (M m^3)	2.60	
7	Recharge from 'Other Sources' during monsoon season (M m^3)	0.46	
8	Gross Rainfall Recharge (M m^3) [(5) + (6)-(7)]	32.59	

Table Rainfall Recharge during Monsoon season after comparing results from Water Table Fluctuation Method and Rainfall Infiltration Factor Method during monsoon season

	Description of items	Quantity
1	Rainfall Recharge during monsoon season	
	a. By Water Table Fluctuation Method (M m^3)	**32.59**
	b. By Rainfall Infiltration Factor Method (M m^3)	**40.01**
2	Difference between (1a) and (1b) expressed as a percentage of (1b), 'PD' $\quad PD = \frac{[(1a)-(1b)]}{(1b)} * 100$	**-18.54%**
3	Rainfall Recharge in the study area during monsoon season after considering the 'PD'	**32.59**
	[= (1a) if 'PD' is between -20 and +20%	
	= 0.8 * (1b) if 'PD' is less than -20%	
	= 1.20 * (1b) if 'PD' is greater than +20%]	

Table Net Groundwater Availability in the study area

	Description of items	M m^3
1	Rainfall Recharge in the study area	
	a. During Monsoon season (Rainfall Infiltration Method)	32.59
	b. During Non-monsoon season (Rainfall Infiltration Method)	1.30

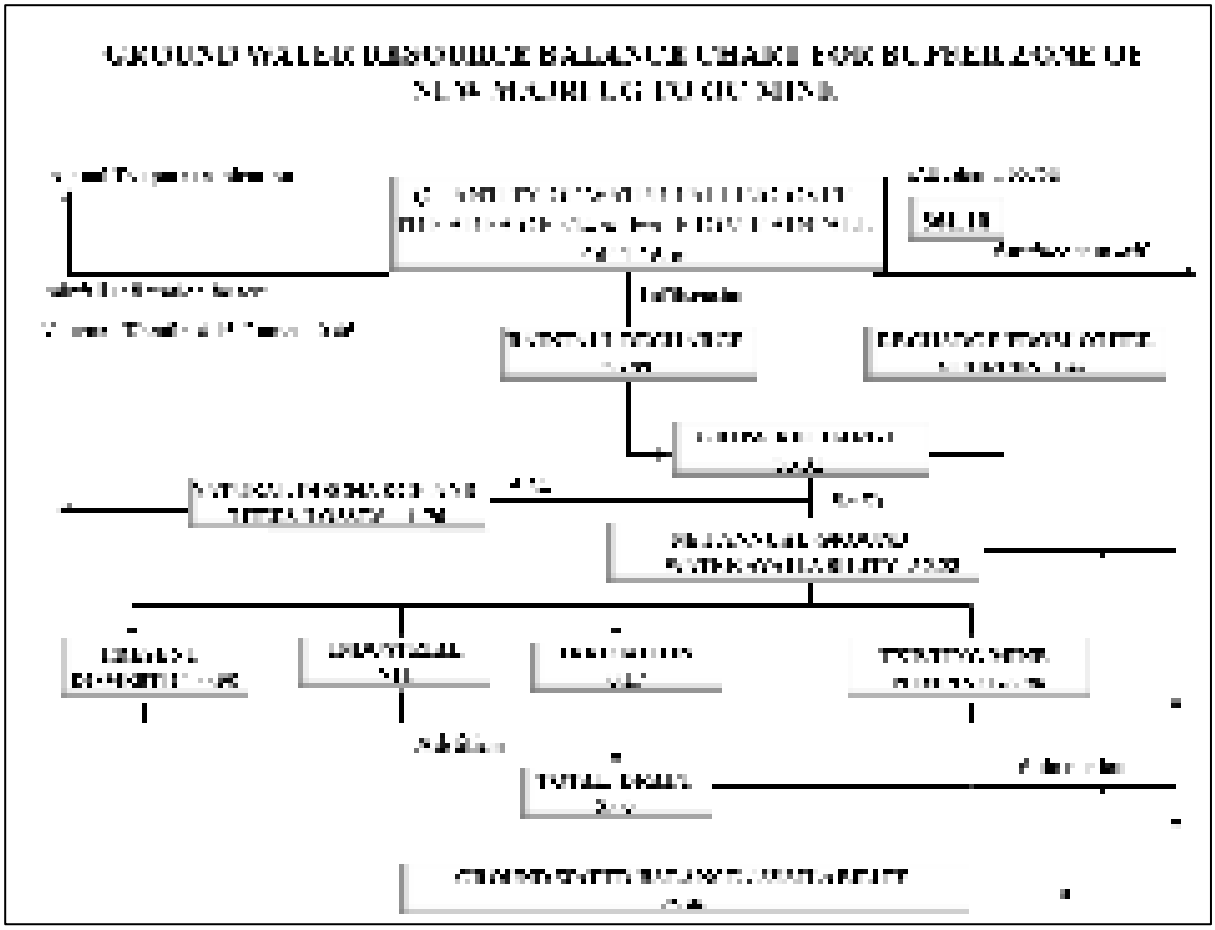
	c. Annual [(1a) + (1b)]	**33.89**
2	Recharge from 'Other Sources'	
	a. During Monsoon season	0.46
	Return flow from Excess mine water [20% as seepage factor]	0.40
	Recharge through water bodies in the area	0.06
	b. During Non-monsoon season	0.96
	Return flow from Irrigation [20 % of Irrigation Draft]	0.03
	Return flow from Excess mine water [20% as a seepage factor]	0.81
	Recharge through water bodies in the area	0.12
	c. Annual [(2a) + (2b)] M m^3	**1.42**
3	Are Environmental Flows assessed (Yes/No)	No
4	Total Annual Groundwater Recharge [(1c) + (2c)]	**35.31**
5	Environmental flows in (M m^3)	**1.76**
	a. [0.05 * (4)] if response to (3) is "NO" and rainfall recharge during monsoon season computed by 'Water table Fluctuation Method'	1.76-
	b. [0.10 * (4)] if response to (3) is "NO" and rainfall recharge during monsoon season is "NOT" computed by 'Water table Fluctuation Method'	-
6	Net Annual Groundwater Availability in the study area [(4) – (5)] M m^3	**33.55**
7	Annual Gross Groundwater Draft for all uses in the study area	**8.09**
8	Balance Available Annual Groundwater Recharge (Net Annual Groundwater Availability – Gross Annual Groundwater Draft)	**25.46**

Table Stage of Groundwater Extraction in the study area

Description of items	Buffer Zone
1. Net Groundwater Availability (M m^3)	33.55
2. Annual Gross Groundwater Draft (M m^3)	8.09
3. Balance Available Annual Groundwater Recharge (M m^3)	25.46
4. Stage of Groundwater Extraction	**24.11%**

The present stage of ground water extraction in and around the project area is 24.11% which can be categorized as safe area. As per CGWB, Central Region, Nagpur the 'Stage of ground water extraction' in Bhadravati tehsil, in which mine is located is 10.37%.

Ground water resource balance flow diagram is furnished below


GROUND WATER RESOURCE BALANCE CHART FOR BUFFER ZONE OF
NEW MAURELGTO OCMINE
SELIB
TOTAL DRAIN

2.7 Groundwater Quality

The groundwater quality in the area is being monitored regularly (once in a year) by WCL through CMPDI, an ISO-9001 company and the results indicate the groundwater does not contain any toxic elements for drinking as per BIS 10500:2012 drinking water standards**.** Generally, the water quality is slightly alkaline in nature with pH value ranging from of 7.0 to 7.4 with low to high concentration of total dissolved solids (TDS) i.e. 383 mg/l to 1390 mg/l though it is within the permissible limit of 2000 mg/l. The concentration of fluoride ranges from 0.56 mg/l to 0.86 mg/l which is within the desirable limit of 1.5 mg/l and the concentration of nitrates varies from 17 mg/l to 44 mg/l which is also under the desirable limit of 45mg/l. Normally, the coal mining activity does not induce any unwanted chemical or elements into the groundwater except for total suspended solids (TSS). Ground water quality analysis data (2018-19) is given table below:

Table Groundwater Quality at Majri and Wislon

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result Sampling Code, Location & Sample collection date		Standard (IS : 10500 : 2012)	
				MAJRI, M-14B 27.11.2018	WISLON, M-7 27/11/2018	Desirable limit	PLV in the absence of alternate source
1	Colour Hz)	IS 3025 /04:1983,Platinum Cobalt	1	1	1	5	15
2	Odour	IS 3025 /05:1983,Physical , Qualitative	Qualitative	Agreeable	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	0.2	7.40	7.40	6.5 to 8.5	No relaxation
5	Total Hardness as	IS-3025/21:2009 EDTA	4.0	288	336	200	600
6	Iron -mg/l	IS-3025/53:2003 AAS-Flame	0.06	BDL	BDL	0.3	No relaxation
7	Chlorides - mg/l	IS-3025/32:1988, Argentometric	2.0	404	280	250	1000
8	Residual Chlorine -mg/l	APHA, 22nd Edition	0.02	BDL	BDL	0.2	1
9	Fluoride- mg/l	APHA, 22nd Edition	0.02	0.58	0.81	1.0	1.5

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result Sampling Code, Location & Sample collection date		Standard (IS : 10500 : 2012)	
				MAJRI, M-14B 27.11.2018	WISLON, M-7 27/11/2018	Desirable limit	PLV in the absence of alternate source
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	383	870	500	2000
11	Calcium -mg/l	IS-3025/40:1991 EDTA	1.6	29	40	75	200
12	Magnesium - mg/l*	APHA, 22nd Edition- Calculation	3	53	58	30	100
13	Copper -mg/l	IS-3025/42:1992 AAS-Flame	0.03	BDL	BDL	0.05	1.5
14	Manganese - mg/l	IS-3025/59:2006 AAS-Flame	0.02	0.040	BDL	0.1	0.3
15	Sulphate -mg/l	APHA, 22nd Edition	2.0	15	192	200	400
16	Nitrates - mg/l	APHA, 22nd Edition UV-Spectrophotometric	0.5	17	41	45	No relaxation
17	Cadmium - mg/l	APHA, 22nd Edition	0.0005	BDL	BDL	0.003	No relaxation
18	Lead -mg/l	APHA, 22nd Edition	0.005	BDL	BDL	0.01	No relaxation
19	Selenium – mg/l*	APHA, 22nd Edition	0.005	BDL	BDL	0.01	No relaxation
20	Total Arsenic - mg/l*	APHA, 22nd Edition	0.005	BDL	BDL	0.01	0.05
21	Zinc -mg/l	IS-3025/49:1994 AAS-Flame	0.01	BDL	BDL	5	15
22	Total Chromium -	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	BDL	BDL	0.05	No relaxation
23	Boron -mg/l	APHA, 22nd EditionCarmine	0.2	BDL	BDL	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	440	480	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame Method	0.02	BDL	BDL	0.02	No relaxation
26	Aluminum - mg/l*	APHA, 22nd Edition	0.03	BDL	BDL	0.1	0.2

Table Groundwater Quality at Naglon and Telwasa Village

Sl. No	Parameters	Test Method	Limits of Detection	Analysis Result Sampling Code, Location & Sample collection date		Standard (IS : 10500 : 2012)	
				NAGLON, M-10 27.11.2018	TELWASA, M-34A 26.11.2018	Desirable limit	PLV in the absence of alternate source
1	Colour Hz)	IS 3025 /04:1983,Platinum Cobalt	1	3	3	5	15
2	Odour	IS 3025 /05:1983,Physical, Qualitative	Qualitative	Agreeable	Agreeable	Agreeable	Agreeable
3	Turbidity (NTU)	IS-3025/10:1984 Nephelometric	1.0	2	2	1	5
4	pH Value	IS-3025/11:1983 Electrometric	0.2	7.3	7.00	6.5 to 8.5	No relaxation
5	Total Hardness as $CaCO_3$ -mg/l	IS-3025/21:2009 EDTA	4.0	860	340	200	600
6	Iron -mg/l	IS-3025/53:2003 AAS-Flame	0.06	BDL	<0.06	0.3	No relaxation
7	Chlorides - mg/l	IS-3025/32:1988, Argentometric	2.0	328	80	250	1000
8	Residual Chlorine -mg/l	APHA, 22nd Edition	0.02	BDL	BDL	0.2	1
9	Fluoride- mg/l	APHA, 22nd Edition	0.02	0.74	0.86	1.0	1.5
10	TDS -mg/l	IS-3025/16:1984 Gravimetric	25.0	1390	610	500	2000
11	Calcium -mg/l	IS-3025/40:1991 EDTA	1.6	72	96	75	200
12	Magnesium - mg/l*	APHA, 22nd Edition- Calculation	3	73	24	30	100
13	Copper -mg/l	IS-3025/42:1992 AAS-Flame	0.03	BDL	BDL	0.05	1.5
14	Manganese - mg/l	IS-3025/59:2006 AAS-Flame	0.02	BDL	BDL	0.1	0.3
15	Sulphate -mg/l	APHA, 22nd Edition	2.0	132	110	200	400
16	Nitrates - mg/l	APHA, 22nd Edition UV-Spectrophotometric	0.5	43	44	45	No relaxation
17	Cadmium - mg/l	APHA, 22nd Edition	0.0005	BDL	BDL	0.003	No relaxation
18	Lead -mg/l	APHA, 22nd Edition	0.005	BDL	BDL	0.01	No relaxation

19	Selenium – mg/l*	APHA, 22nd Edition	0.005	BDL	BDL	0.01	No relaxation
20	Total Arsenic - mg/l*	APHA, 22nd Edition	0.005	BDL	BDL	0.01	0.05
21	Zinc -mg/l	IS-3025/49:1994 AAS-Flame	0.01	BDL	BDL	5	15
22	Total Chromium -	IS 3025 (Part 52) : 2003 AAS-Flame	0.01	BDL	BDL	0.05	No relaxation
23	Boron -mg/l	APHA, 22nd EditionCarmine	0.2	BDL	BDL	0.5	1.0
24	Alkalinity -mg/l	IS-3025/23:1986, Titration	4.0	340	204	200	600
25	Nickel-mg/l	IS 3025 (Part 54) : 2003, AAS-Flame Method	0.02	BDL	BDL	0.02	No relaxation
26	Aluminum - mg/l*	APHA, 22nd Edition	0.03	BDL	BDL	0.1	0.2

The water analysis from the regular monitoring & additional monitoring present the similar picture with all the parameters within the permissible limits.

2.8 Impact of Mining on Water Regime

The mining activity creates dis-equilibrium in environmental scenario of the area and disturbs the groundwater conditions/regime in particular. The impact on water regime due to mining activity can be broadly classified as under:

i) Impact on topography & soil
ii) Impact on surface water and quality
iii) Impact on groundwater & quality

A brief description/out-line on these aspects is given below:

<u>Impact on topography & soil</u>

A local change in ground topography has been created at project area due to mining operations such as open pit, embankments, dumps of overburden and coal. As a result, there might be marginal change in the drainage and surface run-off. During these courses, soil is more susceptible for changes due to erosion, leaching phenomena/process etc. Further the fine dust particles of coal & overburden may adversely affect the porosity of soils. The external dumps will result in silting on soils and local drains thereby marginal change in topography and drainage of the area.

Within the core zone area, cracks and loosening of soil has occurred due to mining and associated activities such as drilling, blasting etc. thereby resulting in physical/textural changes in soil/formations. This mine-induced process increases the rate of infiltration and recharge. So also the backfilled area may be a good media for high groundwater recharge due to high-induced permeability. These mine-induced effects may change the surface run-off in the core zone area resulting in a difference in hydrological regime of local drains.

It may be appropriate to highlight the fact that temporary groundwater loss/deficit created during active mining stage would be compensated by these different means in the post mining stage so that the initial groundwater levels are regained to normalcy at the earliest for the utility of the area.

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It may be appropriate to highlight the fact that temporary groundwater loss/deficit created during active mining stage would be compensated by these different means in the post mining stage so that the initial groundwater levels are regained to normalcy at the earliest for the utility of the area.

Impact on surface water & quality

As mentioned earlier, there is a minor change in the ground topography and infiltration capacity/rate of soil/formation due to mining operations resulting in some local change in drainage pattern and surface run-off in core zone. It is established that high infiltration zone serve as good media for high groundwater recharge and reduces the surface run-off considerably in the core zone. In view of this, the mine has to handle more water in the monsoon besides the additional contribution from the surface run-off from the catchment area. As such the surface run-off contribution to the natural drains from the mining area has been reduced / minimized thereby some minor change is expected in hydrologic regime of the river system.

Impact on Wardha River:

In general, mining of coal by **open cast method** causes changes in topography. The change of ground relief in a mine area influences the local drainage. This may alter the drainage at the micro level.

In the subject case, Wardha River flows at a distance minimum distance of 175 m from the quarry surface and around 1.4 km from the quarry center in the down dip side of the mine. The south-easterly flowing Wardha River is the major drainage and perennial source of water for the area.

Part of Mine lease hold area of New Majri UG to OC mine comes under the watersheds of Koradi Nala and Shirnai nadi at the downstream part of both watersheds. Only about 0.97 sq.km and 2.098 sq. km of the Koradi nala and Shirnai nadi watersheds (which ultimate drains the water to Wardha River) intersects the concerned mine leasehold area respectively. However the total area of Koradi nala and Shirnai nadi watersheds is about 33.07 sq.km and 278.58 sq.km respectively. Mine leasehold area that lie within the Koradi Nala and Shirnai Nadi micro-watershed area constitutes only 2.93% and 0.75% of the respective micro-watersheds. The detailed morphometric analysis is given below (also included in EIA-EMP report):

Morphometric analysis of Micro-Watershed of Koradi Nala and Shirnai Nadi (part of Shirnai nadi before it joins Konda nala). Drainage plan of the buffer zone of mine (10km radius) and location of the micro-watersheds is shown below:

Part of Mine lease hold area of New Majri UG to OC mine comes under the watersheds of Koradi Nala and Shirnai nadi at the downstream part of both watersheds. Only about 0.97 sq.km and 2.098 sq. km of the Koradi nala and Shirnai nadi watersheds intersects the concerned mine leasehold area respectively. However, the total area of Koradi nala and Shirnai nadi watersheds is about 33.07 sq.km and 278.58 sq.km respectively. Hence mine leasehold area that lie within the Koradi Nala and Shirnai Nadi micro-watershed area constitutes only 2.93% and 0.75% of the respective micro-watersheds. Basic morphometric analysis of the two micro watersheds is given below:

Basic morphometric analysis of the Koradi Nala micro water shed

Micro Watershed	Attributes	Stream Order		
		I	II	III
Koradi Nala	Number of streams	23	3	1
	Stream length (km)	19.62	7.20	9.54
	Cumulative stream length (km)	19.62	26.82	36.36
	Mean Stream Length (km)	0.85	2.40	9.54
	Bifurcation Ratio	7.67	3	
	Mean Bifurcation Ratio	5.34		
	Area (sq.km)	33.07		
	Stream Frequency	0.82		
	Drainage Density	1.10		

Basic morphometric analysis of the Shirnai Nadi micro water shed

Micro Watershed	Attributes	Stream Order				
		I	II	III	IV	V
Shirnai Nadi	Number of streams	146	29	8	3	1
	Stream length (km)	179.66	54.34	54.41	12.59	14.56
	Cumulative stream length (km)	179.66	234.00	288.41	301.00	315.56
	Mean Stream Length (km)	1.23	1.87	6.80	4.20	14.56
	Bifurcation Ratio	5.03	3.62	2.67	3	

	Mean Bifurcation Ratio	3.77
	Area (sq.km)	278.58
	Stream Frequency	0.67
	Drainage Density	1.13

Mine leasehold area that lie within the Koradi Nala and Shirnai Nadi micro-watershed area constitutes only 2.93% and 0.75% of the respective micro-watersheds. Moreover, excess mine pumped out water after proper treatment would be discharged to these nala which will be ultimately discharged to Wardha River. Hence, there would be a marginal impact on surface water of Wardha River.

Impact on groundwater & its quality

Mining is associated with groundwater problems, particularly when it is below water table. The impact of mining on groundwater is dependent mainly on mine and aquifer parameters, groundwater recharge-discharge process etc. In opencast mining, the unconfined aquifer gets affected more whereas the semi-confined aquifers are least affected due to continuous gravity drainage and conventional sump pumping or advance dewatering schemes for efficient and safe working. As such, during this exercise, basically the water level is to be depressed /depleted below the working seam depth in which case large scale mine water pumping cannot be avoided. Consequently the mine dewatering drain out some area around the mine with decline in groundwater levels. However, these mine-induced effects are temporary. Further, the mine effluent would contaminate the other resources of water if discharged untreated The water quality monitoring would be continued at the stipulated intervals during mine development.

Groundwater inflow has been estimated and the groundwater monitoring is undertaken as corrective measure to avoid adverse effects. The artificial recharge by water conservation structures in mine influence area proper may not be a viable solution because of the reason that recharged water would drain to the mine at a faster rate due to the steep hydraulic gradients resulted in during mining activity. As mentioned earlier the mine impact is for temporary period during mine life and the area would regain the normalcy/benefits in many ways by appropriate reclamation measures during post-mining period. However, the water

shortage in the mine influence area would be supplemented from the treated mine water discharge for both domestic & irrigation use of affected villages if any.

2.9 Ground Water Management Plan

Augmentation of groundwater recharge potential

To minimize the impact of mining on ground water system, the project/mine authority has been adopting all possible measure to increase the ground water recharge potential.

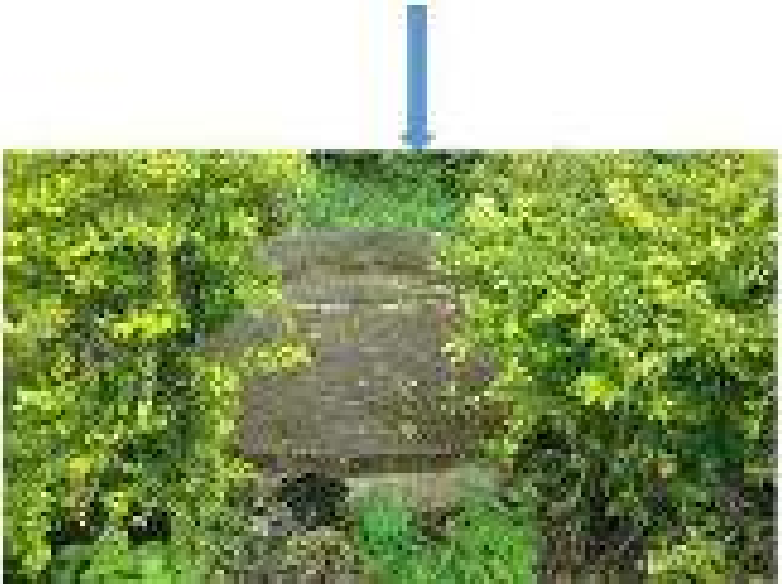
Roof Top Rainwater harvesting exists at: 1) Coal testing Lab, 2)Vocational Training Centre Building(VTC), 3)Majri Area Hospital 4) Area GM office building and 5) Kendriya Vidyalaya, WCL, New Majri. In addition to these measures there exists artificial recharge through structures such as an artificial recharge Pond (Near NMUG Coal stockyard/ Railway Siding Back side).

The photographs of above mentioned Roof-top Rainwater Harvesting and artificial recharge structures is given as follows:

ROOF TOP RAINWATER HARVESTING AT COAL TESTING LAB (ROOF TOP AREA 150m^2)

VTC MAJRI AREA (ROOF TOP AREA 200 m^2)

ROOF TOP RAINWATER HARVESTING AT VTC



RECHARGE PIT AT VTC

MAJRI AREA HOSPITAL (ROOF TOP AREA-2250 m^2)

ROOF TOP RAINWATER HARVESTING AT MAJRI AREA HOSPITAL

ROOF TOP RAIN WATER HARVESTING AT KENDRIYA VIDYALAYA, WCL, NEW MAJRI, MAJRI AREA (ROOF TOP AREA-2000 m^2)

ARTIFICIAL RECHARGE POND NEAR NEW MAJRI UG COAL STOCKYARD (DIMENSION-88 m x 18 m x 1.2 m)

<u>Status of Application for issue of NOC to Abstract Ground Water</u>:

In order to obtain NOC from CGWA, for ground water abstraction from New Majri UG to OC Mine, application for the same has been made via application no. 21-4/509/MH/MIN/2016 on 13.12.2016. The application has been duly recommended for grant of NOC by Regional Office, CGWA. The NOC for groundwater abstraction of 4293 m3/day from New Majri UG to OC mine has been issued vide NOC number CGWA/NOC/MIN/ORIG/2020/7125 with validity upto 08-01-2022.

Chapter 3

FLORA FAUNA ANALYSIS

3.1 Flora & Fauna

Study of the biological environment is one of the most important aspect. This again has a special importance in case of mining project due its location. Mining leases and surrounding area are mostly located in the Agricultural Land, minor Forest area, Commercial area, Habitations and water body. The biological communities are good indicators of climatic and edaphic factors. It is important to conserve natural flora and fauna of an area. In the present study, mainly terrestrial ecosystem has been considered.

Primary survey was under taken in the Core zone and Buffer Zone in the year 2016.

The objectives of this study are as follows:

- To conduct brief study in cultivated and naturally occurring species in the core and buffer zone.
- Survey of terrestrial & aquatic flora and fauna for core and buffer zone.
- Survey of flora covering types e.g. agricultural crops, commercial crops, natural vegetation/forest types, grass lands.
- Survey of species protected by specific legislation (Rare, endangered, critically endangered, endemic and vulnerable).
- To identify locations and features of ecological significance.
- To generate secondary information with the help of public consultation for assessment of flora / fauna /avifauna and other life forms for different activity phases in the study area.

3.2 Activities Undertaken During The Study

1. Flora survey

- Identification and enumeration of different plant species such as Tree, shrub, herb, climber and grasses.
- Diversity assessment for different plant species
- Analysis of Rare-Endangered-Threatened flora

2. Fauna survey

- Documentation of Avian, Reptilian, Insect, Amphibian, Mammal and other faunal diversity

- Observations by direct and indirect evidences (Direct evidence- Sighting and hearing, Indirect evidence- Tracks and signs, nests, feathers/ hairs, Pellets/ scats and other signs
- Analysis of Scheduled species

3. Habitat/microhabitat diversity in the project site and surrounding areas within 10 km range from the site.

3.3 Survey Limitation

The survey recorded the flora and fauna evident during site visit and field survey. It does not record any flora or fauna that may appear at other times of the year, and as such, were not evident at the time of the visit. The report represents ecological status of the area evident during the period of the study.

The survey team has tried to collect the secondary information for the species which are not observed during site visit but can see in the study area through public consultation.

Methodology of the Study:

Survey is conducted in the core zone as well as buffer zone of the project. Methodology of the survey is described as below:

Flora Survey

Identification of vegetation in relation to natural forest flora and croplands is conducted through reconnaissance field surveys and insight observations. The plant species identification is done based on the morphological characteristics and reproductive materials i.e. flowers, fruits and seeds. Land use pattern in relation to agriculture practices and crop verities are identified through physical verification of farmlands.

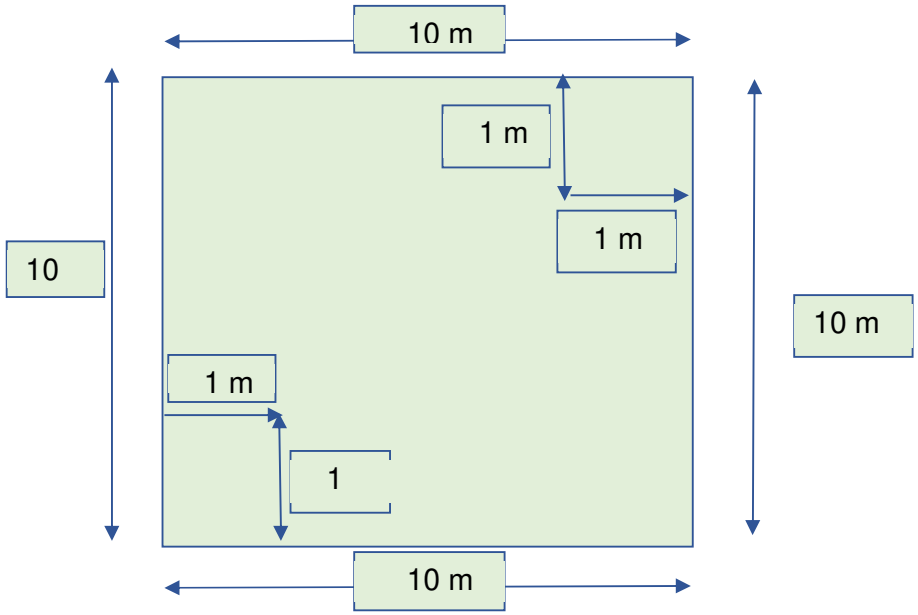
Natural vegetation, invaded species, avenue trees, home garden plants, hedge vegetation of agriculture fields, plants present in the ponds, rivers are noted down. Identity of the herbs, climber, and trees are confirmed using the regional floras. Local names of trees are collected from the villagers. Photograph of the study locations are taken. Latitude and longitude of the location are also recorded.

Co-existence and competition both are affected directly by the number of individuals in the community. Therefore, it is essential to know the quantitative structure of the community. To characterize the community as a whole, certain derived parameters (Density and

Biodiversity Simpson index) which give a clear picture of community structure in quantitative are used.

Secondary data and local names of species are collected from the villagers.

Sampling Technique: A simple stratified random sampling technique was adopted for carrying out ecological sampling in the Core and Buffer zone of the project sites. Sample plots of uniform size 10 X 10 m were laid to enumerate and measure trees and shrub species. Sub plots of 1X1 m were laid diagonally opposite to the main plots to enumerate shrub and grass species. A total number of 16 sample plots (including core and buffer zone) of 10 X 10 m size were laid to assess the vegetation of area. In each sample plots, height and girth of the tree species are measured. A conservative approach was followed to consider pre-project trees, wherein all the vegetation type having girth more than 10 cm were considered as trees, while vegetation less than or equal to 10 cm girth were considered as shrubs. All the tree species data i.e. scientific name, girth class, height and presence of any rare and endangered species were collected from the three strata in a standard format. The herbs, shrubs and grass species were also gathered from the sample plots.



Fauna Survey

The survey is carried out during early hours of morning and late hours of evening time. In the Evening, we observed the insects available in the study area. To assess the potential of the area as habitat of avian fauna, transects method is used. Birds, Insects and

Butterflies were observed by walking carefully through transect. A single observer walks at a constant pace using Binocular. Birds either flying or perched were recorded.

Avian fauna (Bird species) identification has been done from ornithological notes and pictorial descriptions of various authors.

Faunal elements of core and buffer zone were assessed from direct sightings and indirect evidences viz. pug marks, skeletal remains and droppings. The authenticity of occurrence of faunal elements was confirmed by interacting with locals about their presence in the project area. Information pertaining to the local ecology and species of high conservation importance, migratory corridors and wild animal paths were gathered by interacting with locals. The status of each faunal species recorded from the project areas were ascertained as per schedules of Indian Wildlife (Protection) Act, 1972.

Biodiversity Study

Species diversity is one of the efficient ways to analyze community structure. Biodiversity of flora in the core zone and buffer zone were carried out with the help of quadrate sampling by using Simpson's index. Simpson diversity Index takes in to account the density of individual species.

Simpson's Diversity Index is a measure of diversity which takes into account the number of species present, as well as the relative abundance of each species. As species richness and evenness increase, so diversity increases. With this index, 1 represents infinite diversity and 0, no diversity

Simpson index of biodiversity **(D) = 1- C**

Where C = $\sum_{i=0}^{n} \left(\frac{n}{N}\right)^2$

D = Simpson's index of Diversity

n = the total number of organisms of a species,

N = the total number of organisms of all species

The value of this index also ranges between 0 and 1, and the greater the value, the greater the sample diversity.

Comparison of floral biodiversity between core zone and buffer zone is given table below:

Core Zone

Quadrant 1: (20°07'39.8"N; 079° 01'05.5"E)

Sl. No	Species - Common name	Species (Scientific name)	No of trees	Stem circumference (DBH in cm)	Height in meter
1	Sesam	*Dalbergia sissoo* Roxb.	1	80	4.5
2	Yellow cassia	*Cassia siamea* Lam.	3	80-100	9-12
Total			**4**		
Climber/herbs/grasses/tree saplings				NA	
1	Indian madder	*Calotropis gigantea* (L.) R.Br.	1		1.5
2	American Mint	*Hyptis suaveolens* (L.) Poit	10		1
3	Wild sage	*Lantana camera* L.	5		2
4	Mesquite	*Prosopis juliflora* (Sw.) DC.	2		1.5-2

Quadrant 2 (20°07.367N; 079° 01.125E) Cotton, Red gram cultivation

(Weeds and marginal flora)

Sl. No	Species - Common name	Species (Scientific name)	No of trees	Stem circumference (DBH in cm)	Height in meter
1	Jangli sargua	*Moringa concanensis* Nimmo ex Dalzell & A.Gibson	2	50 -110	6-8
Total			**2**		
Climber/herbs/grasses/tree saplings				NA	NA
1	Petari	*Abutilon indicum* (L.) Sweet	6		
2	Kusal	*Alternanthera ficoidea* (L.) P. Beauv.	4		
3	Farid buti	*Cocculus hirsutus* (L.) Diels	1		
4	Sahadevi	*Cyanthillium cinereum* (L.) H.Rob	6		
5	Alay	*Mimosa hamata* Willd.	1		
6	Kakajanga	*Peristrophe bicalyculata* (Retz.) Nees	8		
7	Sharpunka	*Tephrosia purpurea* (L.) Pers	4		

Quadrant 3 (20°07.484N; 079° 00.994E) Cotton cultivation

(Weeds and border vegetation)

S. No	Species - Common name	Species (Scientific name)	No of trees	Stem circumference (DBH in cm)	Height in meter
1	Neem	*Azadirachta indica* A. Juss.	1	220	11
	Ber	*Ziziphus mauritiana* Lamk.	1	10	2
	Total		**2**		
Climber/herbs/grasses/tree saplings				NA	NA
1	Chir chita	*Achyranthus aspera* L.	5		
2	Kusal	*Alternanthera ficoidea* (L.) P. Beauv.	4		
3	Pigeon pea	*Cajanus cajan.* (L.) Millsp.	5		
4	Sahadevi	*Cyanthillium cinereum* (L.) H.Rob	6		
5	Karpas	*Gossypium hirsutum* L	4		
6	Kali Tulasi	*Ocimum americanum* L.	6		
7	Kakajanga	*Peristrophe bicalyculata* (Retz.) Nees	6		
8	Til	*Sesamum orientale* L.	4		
9	Kanphuli	*Tridax procumbens* L.	2		
			42		

Buffer Zone

Quadrant 1 (20°08.703N; 079° 00.921E)

Village plantation

S. No	Species - Common name	Species (Scientific name)	No of trees	Stem circumference (DBH in cm)	Height in meter
1	Imli	*Tamarindus indicus*	1	350	13
	Total		**1**		

Quadrant 2 (20°08.645N; 079° 00.849E)

Commercial crop

S. No	Species - Common name	Species (Scientific name)	No of trees	Stem circumference (DBH in cm)	Height in meter
1	Amla	*Phyllanthus emblica* L.	1	95	9
			1		
Cultivation					
1	Turmeric	*Curcuma longa* L.	5		1

Quadrant 3 (20°08.764N; 079° 01.000E)

Field margin vegetation

S. No	Species - Common name	Species (Scientific name)	No of trees	Stem circumference (DBH in cm)	Height in meter
1	Subabul	*Leucaena leucocephala* (Lam.) deWit	1	25-30	5-6
	Arni	*Clerodendrum phlomidis* L. f.,	2	15	5
	Total		**3**		
Climber/herbs/grasses/tree saplings				NA	
1	Atibala	*Abutilon indicum* L.	4		2
2	Chir chita	*Achyranthus aspera* L.	6		1
3	Farid buti	*Cocculus hirsutus* (L.) Diels	1		
4	Sahadevi	*Cyanthillium cinereum* (L.) H.Rob	4		
5	Karpas	*Gossypium hirsutum* L	4		
6	Kakajanga	*Peristrophe bicalyculata* (Retz.) Nees	6		
7	Mesquite	*Prosopis juliflora* (Sw.) DC.	1		4
8	Castor	*Ricinus communis* L.	2		2
9	makoy	*Solanum americanum* Mill.	4		
10	Giloy	*Tinospora* cordifolia (Willd.) Miers	1		
11	Wild snake guard	*Trichosanthes cucumerina* subsp. *cucumerina*	1		
			34		

Quadrant 4 (20°10.953N; 079° 00.301E)

S. No	Species - Common name	Species (Scientific name)	No of trees	Stem circumference (DBH in cm)	Height in meter
1	Karanj	*Pongamia pinnata (*L.) Pierre	1	10	1.5
2	Seemal	*Salmalia malabarica* (DC) Schott &Endl.	1	160	10
3	Ber	*Ziziphus mauritiana* Lamk.	1	10	1
	Total		**3**		
Climber/herbs/grasses/tree saplings				NA	NA
1	Chir chita	*Achyranthus aspera* L.	5		
2	Kokilaksha	*Barleria longifolia* L	12		
3	Obscura morning glory	*Ipomoea obscura* (L.) Ker Gawler	1		
4	Brazilian jute	*Malachra capitata* (L.) L	6		
5	Babchi	*Psoralea corylifolia* Linn.	7		
6	kharmor	*Rungia repens* (L.) Nees	4		
7	Panwar	*Senna tora* (L.)Roxb.	10		
8	One leaf senna	*Senna uniflora* (Mill.)H.S.Irwin & Barneby	4		

9	Camel bush	*Trichodesma zeylanicum* (Burm. fil.) R. Br.	2		
			51		

Quadrant 5 (20°09.209N; 079° 00.801E)

S. No	Species - Common name	Species (Scientific name)	No of trees	Stem circumference (DBH in cm)	Height in meter
Cultivation					
1	Three lobe false mallow	*Malvastrum coromandelianum* (L.) Garcke	6		
2	Grass	*Oplismenus compositus* (L.) P.Beauv. |	3		
3	Kakajanga	*Peristrophe bicalyculata* (Retz.) Nees	2		1
4	Wire weed	Sida acuta L.	8		
			19		

Quadrant 6 (20°07.778N; 078° 59.845E)

S. No	Species - Common name	Species (Scientific name)	No of trees	Stem circumference (DBH in cm)	Height in meter
1	White acacia	*Acacia leucophloea* (Roxb.) Willd.	1	10	2
2	Babul	*Acacia nilotica* (L.) Willd ex Delile	4	35-90	8-9
3	Paras	*Butea monosperma* (Lam.) Taub.	1	10	1
	Total		**6**		
Climber/herbs/grasses/tree saplings				NA	
1	Petari	*Abutilon indicum* (L.) Sweet	9		1.5
2	Chir chita	*Achyranthus aspera* L.	4		1
3	Mauratian grass	*Apluda mutica* L.	12		
4	shivlinga	*Bryonia laciniosa* L.	2		4
5	American Mint	*Hyptis suaveolens* (L.) Poit	15		1.2
6	Obscura morning glory	*Ipomoea obscura* (L.) Ker Gawler	1		3
7	Wire weed	Sida acuta L.	7		
8	Panwar	*Senna tora* (L.)Roxb.	10		1
			60		

Quadrant 7 (20°08.740N; 079° 00.967E)

S. No	Species - Common name	Species (Scientific name)	No of trees	Stem circumference (DBH in cm)	Height in meter
1	Bargad	*Ficus benghalensis* L.	1	120	8
			1		

Quadrant 8 (20°08.734N; 078° 01.835E)

S. No	Species - Common name	Species (Scientific name)	No of trees	Stem circumference (DBH in cm)	Height in meter
1	Neem	*Azadirachta indica* A. Juss.	1	60	6
2	Arni	*Clerodendrum phlomidis* L. f.,	1	10	2
3	Jangli jilebi	*Pithecellobium dulce* (Roxb.) Benth	1	65	6
	Total		**3**		
Climber/herbs/grasses/tree saplings				NA	
1	Petari	*Abutilon indicum* (L.) Sweet	7		1.5
2	Chir chita	*Achyranthus aspera* L.	7		1
3	Akash bel	*Cassytha filiformis* L.	4		
4	Ridged guard	*Luffa acutangula* (L.) Roxb.	3		5
5	Brazilian jute	*Malachra capitata* (L.) L	10		1.5
6	Three lobe false mallow	*Malvastrum coromandelianum* (L.) Garcke	6		
7	Bristly fox tail.	*Setaria verticillata* (L.) P. Beauv.	5		
8	Cocklebur	*Xanthium strumarium* L.	6		1
			48		

Quadrant 9 (20°02.335N; 078° 58.616E)

S. No	Species - Common name	Species (Scientific name)	No of trees	Stem circumference (DBH in cm)	Height in meter
1	Tendu	*Diospyros melanoxylon* Roxb	5	20-30	2-3
	Total		**5**		
Climber/herbs/grasses/tree saplings				NA	
1	Petari	*Abutilon indicum* (L.) Sweet	7		1.5
2	Chir chita	*Achyranthus aspera* L.	7		1
3	Chanothi	*Aerva monsonia* Mart.	5		
4	Blumea	*Blumea axillaris*(Lam.) DC.	4		
5	Kirma	*Canthium coromandelicum* (Burm.f.) Alston	4	15	3
6	Pala	*Carmona retusa* (Vahl) Masamune	2		1
7	Sahadevi	*Cyanthillium cinereum* (L.) H.Rob	10		
8	Sanatta	*Dodonaea viscosa* (L.) Jacq.	3	10	1-2
9	Love grass	*Eragrostis amabilis* (L.) Wight &Arn	25		
10	Vishnugranti	*Evolvulus alsinoides* (L.) L	15		
11	Kokoray	*Getonia floribunda* Roxb.	10	10	2-3
12	Henkel	*Gymnosporia senegalensis* var. *spinosa* Engl. ex Loes	5	10-15	2
13	Ratan purush	*Hybanthes enneaspermus* (L.) F. Muell.	5		
14	Wild sage	*Lantana camera* L.	3		2
15	Ban methi	*Merremia tridentata* (L.) Hall. fil.	4		
16	Red bhuiamla	*Phyllanthus virgatus* G. Forst.	5		
			114		

Quadrant 10 (20°02.066N; 078° 58.309E)

S. No	Species - Common name	Species (Scientific name)	No of trees	Stem circumference (DBH in cm)	Height in meter
1	Amaltas	*Cassia fistula* L.	1	30	3
2	Mesquite	*Prosopis juliflora* (Sw.) DC.	2	40	5
	Total		**3**		
Climber/herbs/grasses/tree saplings				NA	
1	Kusal	*Alternanthera ficoidea* (L.) P. Beauv.	4		2
2	Kudaliya	*Desmodium triflorum* (L.) DC	4		
3	Love grass	*Eragrostis amabilis* (L.) Wight &Arn	10		
4	Vishnugranti	*Evolvulus alsinoides* (L.) L	15		
5	Kagner	*Justicia procumbens* L.	7		2
6	Bhui Gend	*Lepidagathis cristata* Willd	7		
7	Panwar	*Senna tora* (L.)Roxb.	10		
			57		

Quadrant 11 (20°08.795N; 079° 01.747E)

Sl no	**Species - Common name**	**Species (Scientific name)**	**No of trees**	**Stem circumference (DBH in cm)**	**Height in meter**
1	Babul	*Acacia nilotica* (L.) Willd ex Delile	1	170	13
2	Karipattha	*Murraya koenigii* (L.) Spreng.	1	25	6
	Imli	*Tamarindus indica* L.	1	75	6
	Saguan	*Tectona grandis* L.	1	40	6
	Total		**4**		
Climber/herbs/grasses/tree saplings				NA	
1	Kusal	*Alternanthera ficoidea* (L.) P. Beauv.			
2	Kanphuta	*Cardiospermum halicacabum* L			1
3	Kundru	*Coccinia grandis* (L.) Voigt			
4	Sahadevi	*Cyanthillium cinereum* (L.) H.Rob			
5	Malow	*Malachra capitata* (L.) L.			

Quadrant 12 (20°08.880N; 079° 00.119E)

S. No	Species - Common name	Species (Scientific name)	No of trees	Stem circumference (DBH in cm)	Height in meter
1	Hingota	*Balanites aegyptiaca* (L.) Del.	4	40 -60	4
	Total		**4**		
Climber/herbs/grasses/tree saplings				NA	
1	Chir chita	*Achyranthus aspera* L	7		1
2	Kusal	*Alternanthera ficoidea* (L.) P. Beauv.	5		
3	Cow itch vine	*Cissus trifoliata.* (L.) L.	1		
4	Sponge guard	*Luffa cylindrica* (L.) M. Roem.	2		

Quadrant 13 (20°09.807N; 079° 00.573E)
(Sapota cultivation)

S. No	Species - Common name	Species (Scientific name)	No of trees	Stem circumference (DBH in cm)	Height in meter
1	Chikoo	*Manilkara zapota* (L.) P.van Royen;	3	30 -40	3
	Total		**3**		
Climber/herbs/grasses/tree saplings				NA	NA
1	Agnibuti	*Ammannia baccifera* L	4		
2	Kokilaksha	*Barleria longifolia* L	6		
3	Durva grass	*Cynodon dactyon* (L.) Pers	10		1
4	Sahadevi	*Cyanthillium cinereum* (L.) H.Rob	4		
5	Brazilian jute	*Malachra capitata* (L.) L	7		
6	Santa maria fever few	*Parthenium hysterophorus* L.	7		
7	Babchi	*Psoralea corylifolia* Linn.	7		
8	kharmor	*Rungia repens* (L.) Nees	4		
			49		

Simpson's Index of Biodiversity

Species diversity is one of the efficient ways to analyze community structure. Simpson diversity Index takes in to account the density of individual species.

Simpson's Diversity Index is a measure of diversity which takes into account the number of species present, as well as the relative abundance of each species. As species richness and evenness increase, so diversity increases. With this index, 1 represents infinite diversity and 0, no diversity

Simpson index of biodiversity **(D) = 1- C**

Where C = $\sum_{i=0}^{n} \left(\frac{n}{N}\right)^2$

D = Simpson's index of Diversity

n = the total number of organisms of a species,

N = the total number of organisms of all species

The value of this index also ranges between 0 and 1, and the greater the value, the greater the sample diversity.

Comparison of floral biodiversity between core zone and buffer zone is given table below:

Table Biodiversity of the project

Zone	Quadrat Location	Simpson index of Biodiversity	% Simpson index of Biodiversity
Core	**20°07'39.8"N; 079° 01'05.5"E**	0.375	37.5
	20°07.367N; 079° 01.125E	0	0
	20°07.484N; 079° 00.994E	0.5	50
Buffer	**20°08.703N; 079° 00.921E**	0	0
	20°08.645N; 079° 00.849E	0	0
	20°08.764N; 079° 01.000E	0.44	44.44
	20°10.953N; 079° 00.301E	0.66	66.66
	20°09.209N; 079° 00.801E	0.5	50
	20°07.778N; 078° 59.845E	0.5	50
	20°08.740N; 079° 00.967E	0	0
	20°08.734N; 078° 01.835E	0.66	66.66
	20°02.335N; 078° 58.616E	0	0
	20°02.066N; 078° 58.309E	0.44	44.44
	20°08.795N; 079° 01.747E	0.75	75
	20°08.880N; 079° 00.119E	0	0
	20°09.807N; 079° 00.573E	0	0

The above shows that, biodiversity in core zone ranged between **0 - 0.5**. Biodiversity in buffer zone ranged between **0 – 0.75.** Buffer zone mostly comprises of agricultural fields and degraded forests. Higher value of biodiversity indicates abundance in variety of flora in the sampling area. Both buffer and core zone have abundance in variety of flora.

FLORA OF THE STUDY AREA

Flora of the project areas is classified in to Terrestrial and Aquatic flora.

Terrestrial Flora

Terrestrial flora consists of the following:

(i) Agriculture crops cultivated (Cereals, Pulses, Vegetables) during rainy season (Kharif) and post rainy months of winter season (Rabi);

(ii) Commercial Crops;

(iii) Natural vegetation of Forest type includes endemic species/ endangered species.

(iv) Plantations and Agro-forestry species and

(v) Grass lands

(i) AGRICULTURAL CROPS

Important categories of crops include cereals, pulses (legumes), fruits and vegetables. Cropping systems vary across farms depending on the available resources and constraints; geography and climate of the area. To a certain extent most of the agriculture activities are confined to Southwest monsoon period of June to September. Agriculture crops of study area are cultivated in backyards and farmlands during post-rainy months. A checklist of vegetables of the core and buffer zone are presented below in table.

Table List of Vegetables in the Core Zone

S.No	Botanical name	English name	Common /Hindi name	Name of class/Family
1	*Capsicum annum* L.	Chilly	Lalmirchi	*Solanaceae*
2	*Cucurbita maxima* Duch ex Lam.	Pumpkin	Kaddoo	*Cucurbitaceae*
3	*Lagenaria siceraria* (Molina) Standl	Bottle guard	Laukee	*Cucurbitaceae*
4	*Luffa cylindrica* (L.) M.Roem.	Spong gourd	Spanjlaukee	*Cucurbitaceae*
5	*Lycopersicum esculentum* L.	Tomato	Tamatar	*Solanaceae*
6	*Rhapanus sativus* L.	Radish	Moolee	*Brassicaceae*
7	*Solanum melongena* L.	Brinjal	Baingan	*Solanaceae*
8	*Trichosanthes dioica* Roxb.	Pointed guard	Parwal	*Cucurbitaceae*
Source: *Field survey, Interaction with local people*				

Table List of Vegetables in the Buffer Zone

S.No	Botanical name	English name	Common /Hindi Name	Name of class/Family
1	*Capsicum annum* L.	Chilly	Lalmirchi	*Solanaceae*
2	*Citrus limon* (L.) Burm f	Lemon	Nimbu	*Rutaceae*
3	*Cucurbita maxima* Duch ex Lam.	Pumpkin	Kaddoo	*Cucurbitaceae*
4	*Ipomoea batatas* (L.) Lam.	Sweet potato	Shakarakand	*Convolvulaceae*
5	*Lagenaria siceraria* (Molina) Standl	Bottle guard	Laukee	*Cucurbitaceae*
6	*Luffa cylindrica* (L.) M.Roem.	Spong gourd	Spanjlaukee	*Cucurbitaceae*

7	*Lycopersicum esculentum* L.	Tomato	Tamatar	*Solanaceae*
8	*Rhapanus sativus* L.	Radish	Moolee	*Brassicaceae*
9	*Solanum melongena* L.	Brinjal	Baingan	*Solanaceae*
10	*Trichosanthes dioica* Roxb.	Pointed guard	Parwal	*Cucurbitaceae*
Source: *Field survey, Interaction with local people*				

(ii) COMMERCIAL CROPS

Farmers grow grains, legumes, and vegetables to feed their families and their livestock. But anything beyond that grown to make money would be a commercial crop. The check list of commercial crops is presented below in table.

Table List of Commercial Crops in Core Zone

	Botanical name	**Englih name**	**Common /Hindi Name**	**Name of class/Family**
1	*Cajanus cajan (L) Millsp*	Pigeon pea	Tur dal	*Leguminosae*
2	*Cicer arietinum* L.	Chickpea	Kaabuleechana	*Leguminosae*
3	*Curcuma longa* L.	Turmeric	Haldi	*Zingiberaceae*
4	*Gossypium hirsutum L*	Cotton	Karpas	*Malvaceae*
5	*Oryza sativa* L.	Paddy	Dhaan	*Poaceae*
6	*Sesamum orientale* L.	Sesame	Til	*Pedaliaceae*
7	*Sorghum bicolor*	Sorghum	Jowari	*Poaceae*
8	*Zea mays* L.	Maize	Makka	*Poaceae*
Source: *Field survey, Interaction with local people*				

Table List of Commercial Crops in Buffer Zone

	Botanical name	**Englih name**	**Common /Hindi Name**	**Name of class/Family**
1	*Cajanus cajan (L) Millsp*	Pigeon pea	Tur dal	*Leguminosae*
2	*Cicer arietinum* L.	Chickpea	Kaabuleechana	*Leguminosae*
3	*Curcuma longa* L.	Turmeric	Haldi	*Zingiberaceae*
4	*Gossypium hirsutum L*	Cotton	Karpas	*Malvaceae*
5	*Manilkara zapota* (L.) P.van Royen;	Sapota	chikoo	*Sapotaceae*
6	*Oryza sativa* L.	Paddy	Dhaan	*Poaceae*
7	*Sesamum orientale* L.	Sesame	Til	*Pedaliaceae*
8	*Sorghum bicolor*	jowari		*Poaceae*
9	*Zea mays* L.	Maize	Makka	*Poaceae*

(iii) NATURAL VEGETATION/ FOREST TYPE

These are uncultivated and uninhabited pieces of land covered by trees and shrubs. They play a vital role in the life and culture of the people. They form an important renewable natural resource. In the absence of scientific management in the past, forests of the study area have suffered from heavy deforestation. Biotic pressure exerted by human beings and domestic animals of surrounding areas is also tremendous. The buffer zone forest is a scrub jungle.

The status of natural vegetation / forest flora of the study is presented below in tables.

Table : List of Natural Vegetation in Core Zone

	Botanical name	**English name**	**Common /Hindi name**	**Name of class/Family**	**Ecological sensitivity status REET**
Trees					
1	*Acacia leucophloea (*Roxb.) Willd.	White Acacia	Hiwar	*leguminosae*	-
2	*Acacia nilotica* (L.) Willd ex Delile	Babul	Babool	*Leguminosae*	-
3	*Aegle marmelos* (L.) Corrêa	Stone apple	Bael	*Rutaceae*	-
4	*Albizia procera* (Roxb.) Benth.	White sirish	Safedsirish	*Leguminosae*	-
5	*Albizia lebbeck* (L.) Benth	Sirish	Shirish	*Leguminosae*	-
6	*Alstonia scholoris* (L.) R.Br	Blackboard tree	Saptaparni,Chitvan	*Apocynaceae*	-
7	*Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Guillem. &Perr	Axle Wood Tree	Dhonkda	*Combretaceae*	-
8	*Balanites aegyptiaca* (L.) Del.	*Egyptian myrobalan*	Hingot	*Zygophyllaceae*	-
9	*Buchanania cochinchinensis* (Lour.) M.R.Almeida	_	Chhar	*Anacardiaceae*	-
10	*Butea monosperma* (Lam.) Taub.	Flame of the forest	Palash, Dhak	*Leguminosae*	-
11	*Casearia tomentosa* Roxb		Tondri	*Salicaceae*	-
12	*Cassia fistula* L.	Indian laburnum	Amaltas	*Leguminosae*	-
13	*Chloroxylon swietenia* DC.	East Indian satinwood	Bhirra	*Rutaceae*	-
14	*Dalbergia paniculata* Roxb		Dhobin	*Leguminosae*	-

15	*Dalbergia sissoo* Roxb	Sissoo	sesam	*Leguminosae*	
16	*Diospyros melanoxylon* Roxb.	Coromandel ebony	Tendu	*Ebenaceae*	**-**
17	*Ficus benghalensis*L.	Banyan	Bargad	*Moraceae*	**-**
18	*Ficus racemosa*L.	Cluster Fig	Goolar	*Moraceae*	**-**
19	*Ficus religiosa*L.	Sacred fig	Pipal	*Moraceae*	**-**
20	*Gmelina arborea* Roxb.	Beech wood	Gamhar	*Lamiaceae*	**-**
21	*Haldina cordifolia* (Roxb.) Ridsdale	Haldu	Karam	*Rubiaceae*	**-**
22	*Holoptelea integrifoila* (Roxb.) Planch	Indian elm	arjan	*Ulmaceae*	**-**
23	*Ixora parviflora* Lam	White ixora	Kotogandal	*Rubiaceae*	**-**
24	*Lagerstroemia parviflora* Roxb.	Small Flowered Crape Myrtle	Dawra	*Lythraceae*	**-**
25	*Lannea coromandelica* (Houtt.) Merr	Indian ash tree	Mohin	*Anacardiaceae*	**-**
26	*Madhuca longifolia var. latifolia* (Roxb.) A.Chev.	Indian butter tree	Mahua	*Sapotaceae*	**-**
27	*Mangifera indica* L.	Mango	Aam,	*Anacardiaceae*	**-**
28	*Moringa concanensis* Nimmo ex Dalzell & A.Gibson	Wild drum stick	Jangli sargua	*Moringaceae*	**-**
29	*Phoenix sylvestris*(L.) Roxb.	Wild Date Palm	Khajur	*Arecaceae*	**-**
30	*Phyllanthus emblica* L.	Emblicmyrobalan	Amla	*Phyllanthaceae*	**-**
31	*Pithecellobium dulce* (Roxb.) Benth.	Manila tamarind	Ganga imli	*Leguminosae*	**-**
32	*Pongamia pinnata* (L.) Pierre	Indian beech	Karanjva	*Legumonosae*	**-**
33	*Pterocarpus marsupium* Roxb.	Indian kino	Bijay	*leguminosae*	**-**
34	*Salmalia malabarica* (DC) Schott &Endl.	Silk cotton	Salmale	*Bombacaceae*	**-**
35	*Shorea robusta* Gaertn.	Sal	sarai	*Dipterocarpaceae*	
36	*Syzygium cuminii* (L.) Skeels	Rose apple	Jamun	*Myrtaceae*	**-**
37	*Tectona grandis* L.	Teak,	saghvan	*Lamiaceae*	**-**
38	*Terminalia arjuna* (Roxb.) Wt&Arn.	Arjun	Arjun, mathi	*Combretaceae*	**-**
39	*Terminalia tomentosa* Wight & Arn	Marda	Saja	*Combretaceae*	**-**

40	*Wrightia tinctoria* R.Br.	Sweet Indrajao	Kutajau	*Apocynaceae*	**-**
41	*Ziziphus mauritiana* Lamk.	Indian plum	Ber	*Rhamnaceae*	**-**
Shrubs					
1	*Annona squamosa* L.	Custard apple	Custard apple	*Annonaceae*	**-**
2	*Calotropis gigantean* (L.) R.Br.	Indian mader	Indian mader	*Apocynaceae*	**-**
3	*Chromolaena odorata* (L.) R.M.King &H.Rob.	Jack in the bush	Jack in the bush	*Asteraceae*	**-**
4	*Dodonaea viscosa* (L.) Jacq.		Sanatta	*Sapindaceae*	**-**
5	*Gardenia gummifera* L.f	Dikamalli	Dikamalli	*Rubiaceae*	**-**
6	*Ipomoea carnea* Jace	Bush morning glory	besharam	*Convolvulaceae*	**-**
7	*Lantana camera* L.	Wild sage	Raimuniya	*Lamiaceae*	**-**
8	*Mimosa hamata* Willd.		Alay	*Leguminosae*	**-**
9	*Phyllanthus reticulates* L.	Black-Honey Shrub	Kanbojini	*Phyllanthaceae*	**-**
10	*Randia dumetorum* Lamk		Mainphal	*Rubiaceae*	**-**
11	*Ricinus communis* L.	Castor	Arandi	*Euphorbiaceae*	**-**
12	*Senegalia pennata*Mizo	Climbing wattle	Biswal	*Leguminosae*	**-**
13	*Senna alata* (L.) Roxb.	Candle bush	Ergaj	*Leguminosae*	**-**
14	*Thevetia neriifolia* Juss. exSteud.	Yellow oleander	Peelikaner	*Apocynaceae*	**-**
15	*Vachellia farnesiana*(L.) Wight &Arn.	Sweet acacia	Guhbaboool,	*Leguminosae*	**-**
16	*Vitex negundo* L.	Chaste Tree.	Nirgundi	*Verbenaceae*	**-**
17	*Zizyphus oenoplia* (L.)Miller	Small-Fruited Jujube	Makora	*Rhamnaceae*	**-**
Climbers					
1	*Bryonia laciniosa* L.		shivlinga	*Cucurbitaceae*	**-**
2	Caesalpinia bonduc (L.) Roxb.	fever nut	Kankarej,	*Leguminosae*	**-**
3	*Cassytha filiformis* L.		Akash bel	*Convolvulaceae*	**-**
4	*Cissampelos pareira*L.	False Pareira Brava	Padh	*Menispermaceae*	**-**
5	*Cocculus hirsutus* (L.) Diels		Farid buti	*Menispermaceae*	**-**
6	*Dioscorea pentaphylla* L.	Five Leaf Yam	Kantaalu,	*Dioscoreaceae*	**-**
7	*Hemidesmus indicus* (L.) R. Br. ex Schult.	Indian sarsaparilla	Anantmul	*Apocynaceae*	**-**

8	*Ichnocarpus frutescens* (L.) R.Br.	Black Creeper	Kali doddee	*Apocynaceae*	**-**
9	*Ipomoea obscura* (L.) Ker Gawler	Obscura morning glory		*Convolvulaceae*	**-**
10	*Quisqualis indica* L.	Rangoon creeper	Not available	*Combretaceae*	**-**
11	*Getonia floribunda* Roxb		Kokoray	*Combretaceae*	
12	*Tinospora sinensis* (Lour.) Merr.	Malabar Gulbel	Giloy	*Menispermaceae*	**-**
13	*Wattakaka volubilis* (L.f) Stap f	Sneeze Wort	dugdhive	*Apocynaceae*	**-**
Herbs					
1	*Abutilon indicum* (L.) Sweet		Petari	*Malvaceae*	
2	*Achyranthus aspera* L.	Prickly Chaff Flower	Chirchita	*Amaranthaceae*	**-**
3	*Alternanthera ficoidea* (L.) P. Beauv.	Smooth Joy weed	Kusal	*Amaranthaceae*	**-**
4	*Alysicarpus monilifer* (L.) DC.	Alyce Clover	-	*Leguminosae*	**-**
5	*Alysicarpus vaginalis* (L.) DC	Alyce Clover	Chauli/Sauri	*Leguminosae*	**-**
6	*Blumea axillaris*(Lam.) DC.	Not available	Not available	*Asteraceae*	**-**
7	*Celosia argentea* L.	silver cock's comb	Common Cockscomb	*Amaranthaceae*	**-**
8	*Cyanthillium cinereum* (L.) H.Rob		Sahadevi	*Compositae*	**-**
9	*Desmodium triflorum* (L.) DC	Threeflowerticktrefoil	Kudalia	*Leguminosae*	**-**
10	*Eclipta prostrata* (L.) L.	False Daisy	Bringaraj	*Asteraceae*	**-**
11	*Euphorbia hirta* L.	Asthma Weed	Laldudhi	*Euphorbiaceae*	**-**
12	*Evolvulus alsinoides* (L.) L.	Dwarf Morning Glory	Vishnugrantha	*Convolvulaceae*	**-**
13	*Hyptis suaveolens* (L.) Poit	American Mint	Vilaititulasi	*Lamiaceae*	**-**
14	*Justicia procumbens* L.		Kagner		**-**
15	*Lepidagathis cristata* Willd		Bhui Gend	*Acanthaceae*	**-**
16	*Leucas indica* (L.) R.Br ex Vatke	Not known	Dronapushpi	*Lamiaceae*	**-**
17	*Malachra capitata* (L.) L	Brazilian jute		*Malvaceae*	
18	*Merremia tridentata* (L.) Hall. fil.		Ban methi	*Convolvulaceae*	**-**
19	*Mimosa pudica* L.	Touch me not	Lajjalu	*Leguminoae*	**-**

20	*Mollugo pentaphylla* L.	Carpet weed	Jharasi	*Molluginaceae*	**-**
21	*Ocimum americanum* L.	Lemon tulasi	Kali Tulasi		**-**
22	*Oldenlandia tenelliflora (Blume) Kuntze*	Wild weed	-	*Rubiaceae*	**-**
23	*Peristrophe bicalyculata* (Retz.) Nees	Panicled Foldwing	Kakajanga	*Acanthaceae*	**-**
24	*Phyllanthus virgatus G. Forst.*	*Red bhuiamla*	-	*Phyllanthaceae*	**-**
25	*Scoparia dulcis*L.	Sweet Broom Weed,	Mithipatti.	*Scrophulariaceae*	**-**
26	*Senna uniflora (*Mill.)H.S.Irwin & Barneby	One leaf senna	-	*Leguminosae*	**-**
27	*Senna tora (*L.) Roxb.	Stinking Cassia	Panwar	*Leguminosae*	**-**
28	*Sida acuta*L.	Common Wireweed	Baraira	*Malvaceae*	**-**
29	*Sida cordata* (Burm.f.) Borss.Waalk	Long stalked sida	Bhuinii	Malvaceae	**-**
30	*Sida rhombifolia* L.	Sahadeva	-	*Malvaceae*	
31	*Spermacoce hispida* L.	Shaggy Buttonweed	Madanaghanti	*Rubiaceae*	**-**
32	*Spilanthes acmella* (L.) L.		Akarkar	*Compositae*	**-**
33	*Tephrosia purpurea* (L.) Pers	Common Tephrosia	Sharpunka	*Leguminosae*	**-**
34	*Tridax procumbens* L		Kanphuli	*Compositae*	**-**
35	*Triumfetta rhomboideae* Jacq.	Burr Bush,	Chikti	*Malvaceae*	**-**
36	*Xanthium strumarium* L.	Cocklebur	Chota Dhatura,	*Asteraceae*	**-**

Source: *Field survey, Interaction with local people*

Table List of Natural Vegetation in Buffer Zone

	Botanical name	**English name**	**Common /Hindi name**	**Name of class/Family**	**Ecological sensitivity status REET**
Trees					
1	*Acacia leucophloea (*Roxb.) Willd.	White Acacia	Hiwar	*leguminosae*	**-**
2	*Acacia nilotica* (L.) Willd ex Delile	Babul	Babool	*Leguminosae*	**-**
3	*Aegle marmelos* (L.) Corrêa	Stone apple	Bael	*Rutaceae*	**-**

4	*Albizia procera* (Roxb.) Benth.	White sirish	Safedsirish	*Leguminosae*	**-**
5	*Albizia lebbeck* (L.) Benth	Sirish	Shirish	*Leguminosae*	**-**
6	*Alstonia scholoris* (L.) R.Br	Blackboard tree	Saptaparni, Chitvan	*Apocynaceae*	**-**
7	*Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Guillem. &Perr	Axle Wood Tree	Dhonkda	*Combretaceae*	**-**
8	*Balanites aegyptiaca* (L.) Del.	*Egyptian myrobalan*	Hingot	*Zygophyllaceae*	**-**
9	*Buchanania cochinchinensis* (Lour.) M.R.Almeida		Chhar	*Anacardiaceae*	**-**
10	*Butea monosperma* (Lam.) Taub.	Flame of the forest	Palash, Dhak	*Leguminosae*	**-**
11	*Casearia tomentosa* Roxb		Tondri	*Salicaceae*	**-**
12	*Cassia fistula* L.	Indian laburnum	Amaltas	*Leguminosae*	**-**
13	*Chloroxylon swietenia* DC.	East Indian satinwood	Bhirra	*Rutaceae*	**-**
14	*Dalbergia paniculata* Roxb		Dhobin	*Leguminosae*	**-**
15	*Dalbergia sissoo* Roxb	Sissoo	sesam	*Leguminosae*	
16	*Diospyros melanoxylon* Roxb.	Coromandel ebony	Tendu	*Ebenaceae*	**-**
17	*Ficus benghalensis*L.	Banyan	Bargad	*Moraceae*	**-**
18	*Ficus racemosa*L.	Cluster Fig	Goolar	*Moraceae*	**-**
19	*Ficus religiosa*L.	Sacred fig	Pipal	*Moraceae*	**-**
20	*Gmelina arborea* Roxb.	Beech wood	Gamhar	*Lamiaceae*	**-**
21	*Haldina cordifolia* (Roxb.) Ridsdale	Haldu	Karam	*Rubiaceae*	**-**
22	*Holoptelea integrifoila* (Roxb.) Planch	Indian elm	arjan	*Ulmaceae*	**-**
23	*Ixora parviflora* Lam	White ixora	Kotogandal	*Rubiaceae*	**-**
24	*Lagerstroemia parviflora* Roxb.	Small Flowered Crape Myrtle	Dawra	*Lythraceae*	**-**
25	*Lannea coromandelica* (Houtt.) Merr	Indian ash tree	Mohin	*Anacardiaceae*	**-**
26	*Madhuca longifolia var. latifolia* (Roxb.) A.Chev.	Indian butter tree	Mahua	*Sapotaceae*	**-**

27	*Mangifera indica* L.	Mango	Aam,	*Anacardiaceae*	**-**
28	*Moringa concanensis* Nimmo ex Dalzell & A.Gibson	Wild drum stick	Jangli sargua	*Moringaceae*	**-**
29	*Phoenix sylvestris*(L.) Roxb.	Wild Date Palm	Khajur	*Arecaceae*	**-**
30	*Phyllanthus emblica* L.	Emblicmyrobalan	Amla	*Phyllanthaceae*	**-**
31	*Pithecellobium dulce* (Roxb.) Benth.	Manila tamarind	Ganga imli	*Leguminosae*	**-**
32	*Pongamia pinnata* (L.) Pierre	Indian beech	Karanjva	*Legumonosae*	**-**
33	*Pterocarpus marsupium* Roxb.	Indian kino	Bijay	*leguminosae*	**-**
34	*Salmalia malabarica* (DC) Schott &Endl.	Silk cotton	Salmale	*Bombacaceae*	**-**
35	*Shorea robusta* Gaertn.	Sal	sarai	*Dipterocarpaceae*	
36	*Syzygium cuminii* (L.) Skeels	Rose apple	Jamun	*Myrtaceae*	**-**
37	*Tectona grandis* L.	Teak,	saghvan	*Lamiaceae*	**-**
38	*Terminalia arjuna* (Roxb.) Wt&Arn.	Arjun	Arjun, mathi	*Combretaceae*	**-**
39	*Terminalia tomentosa* Wight & Arn	Marda	Saja	*Combretaceae*	**-**
40	*Wrightia tinctoria* R.Br.	Sweet Indrajao	Kutajau	*Apocynaceae*	**-**
41	*Ziziphus mauritiana* Lamk.	Indian plum	Ber	*Rhamnaceae*	**-**
Shrubs					
1	*Annona squamosa* L.	Custard apple	Custard apple	*Annonaceae*	**-**
2	*Calotropis gigantean* (L.) R.Br.	Indian mader	Indian mader	*Apocynaceae*	**-**
3	*Chromolaena odorata* (L.) R.M.King &H.Rob.	Jack in the bush	Jack in the bush	*Asteraceae*	**-**
4	*Dodonaea viscosa* (L.) Jacq.		Sanatta	*Sapindaceae*	**-**
5	*Gardenia gummifera* L.f	Dikamalli	Dikamalli	*Rubiaceae*	**-**
6	*Ipomoea carnea* Jace	Bush morning glory	besharam	*Convolvulaceae*	**-**
7	*Lantana camera* L.	Wild sage	Raimuniya	*Lamiaceae*	**-**
8	*Mimosa hamata* Willd.		Alay	*Leguminosae*	**-**
9	*Phyllanthus reticulates* L.	Black-Honey Shrub	Kanbojini	*Phyllanthaceae*	**-**

10	*Randia dumetorum* Lamk		Mainphal	*Rubiaceae*	**-**
11	*Ricinus communis* L.	Castor	Arandi	*Euphorbiaceae*	**-**
12	*Senegalia pennata*Mizo	Climbing wattle	Biswal	*Leguminosae*	**-**
13	*Senna alata* (L.) Roxb.	Candle bush	Ergaj	*Leguminosae*	**-**
14	*Thevetia neriifolia* Juss. exSteud.	Yellow oleander	Peelikaner	*Apocynaceae*	**-**
15	*Vachellia farnesiana*(L.) Wight &Arn.	Sweet acacia	Guhbabooo l,	*Leguminosae*	**-**
16	*Vitex negundo* L.	Chaste Tree.	Nirgundi	*Verbenaceae*	**-**
17	*Zizyphus oenoplia* (L.)Miller	Small-Fruited Jujube	Makora	*Rhamnaceae*	**-**
Climbers					
1	*Bryonia laciniosa* L.		shivlinga	*Cucurbitaceae*	**-**
2	Caesalpinia bonduc (L.) Roxb.	fever nut	Kankarej,	*Leguminosae*	**-**
3	*Cassytha filiformis* L.		Akash bel	*Convolvulaceae*	**-**
4	*Cissampelos pareira*L.	False Pareira Brava	Padh	*Menispermaceae*	**-**
5	*Cocculus hirsutus* (L.) Diels		Farid buti	*Menispermaceae*	**-**
6	*Dioscorea pentaphylla* L.	Five Leaf Yam	Kantaalu,	*Dioscoreaceae*	**-**
7	*Hemidesmus indicus* (L.) R. Br. ex Schult.	Indian sarsaparilla	Anantmul	*Apocynaceae*	**-**
8	*Ichnocarpus frutescens* (L.) R.Br.	Black Creeper	Kali doddee	*Apocynaceae*	**-**
9	*Ipomoea obscura* (L.) Ker Gawler	Obscura morning glory		*Convolvulaceae*	**-**
10	*Quisqualis indica* L.	Rangoon creeper	Not available	*Combretaceae*	**-**
11	*Getonia floribunda* Roxb		Kokoray	*Combretaceae*	
12	*Tinospora sinensis* (Lour.) Merr.	Malabar Gulbel	Giloy	*Menispermaceae*	**-**
13	*Wattakaka volubilis* (L.f) Stap f	Sneeze Wort	dugdhive	*Apocynaceae*	**-**
Herbs					
1	*Abutilon indicum* (L.) Sweet		Petari	*Malvaceae*	
2	*Achyranthus aspera* L.	Prickly Chaff Flower	Chirchita	*Amaranthaceae*	**-**

3	*Alternanthera ficoidea* (L.) P. Beauv.	Smooth Joy weed	Kusal	*Amaranthaceae*	**-**
4	*Alysicarpus monilifer* (L.) DC.	Alyce Clover	-	*Leguminosae*	**-**
5	*Alysicarpus vaginalis* (L.) DC	Alyce Clover	Chauli/Sauri	*Leguminosae*	**-**
6	*Blumea axillaris*(Lam.) DC.	Not available	Not available	*Asteraceae*	**-**
7	*Celosia argentea* L.	silver cock's comb	Common Cockscomb	*Amaranthaceae*	**-**
8	*Cyanthillium cinereum* (L.) H.Rob		Sahadevi	*Compositae*	**-**
9	*Desmodium triflorum* (L.) DC	Threeflowerticktrefoil	Kudalia	*Leguminosae*	**-**
10	*Eclipta prostrata* (L.) L.	False Daisy	Bringaraj	*Asteraceae*	**-**
11	*Euphorbia hirta* L.	Asthma Weed	Laldudhi	*Euphorbiaceae*	**-**
12	*Evolvulus alsinoides* (L.) L.	Dwarf Morning Glory	Vishnugrantha	*Convolvulaceae*	**-**
13	*Hyptis suaveolens* (L.) Poit	American Mint	Vilaititulasi	*Lamiaceae*	**-**
14	*Justicia procumbens* L.		Kagner		**-**
15	*Lepidagathis cristata* Willd		Bhui Gend	*Acanthaceae*	**-**
16	*Leucas indica* (L.) R.Br ex Vatke	Not known	Dronapushpi	*Lamiaceae*	**-**
17	*Malachra capitata* (L.) L	Brazilian jute		*Malvaceae*	
18	*Merremia tridentata* (L.) Hall. fil.		Ban methi	*Convolvulaceae*	**-**
19	*Mimosa pudica* L.	Touch me not	Lajjalu	*Leguminoae*	**-**
20	*Mollugo pentaphylla* L.	Carpet weed	Jharasi	*Molluginaceae*	**-**
21	*Ocimum americanum* L.	Lemon tulasi	Kali Tulasi		**-**
22	*Oldenlandia tenelliflora (Blume) Kuntze*	Wild weed	-	*Rubiaceae*	**-**
23	*Peristrophe bicalyculata* (Retz.) Nees	Panicled Foldwing	Kakajanga	*Acanthaceae*	**-**
24	*Phyllanthus virgatus G. Forst.*	*Red bhuiamla*	-	*Phyllanthaceae*	**-**
25	*Scoparia dulcis*L.	Sweet Broom Weed,	Mithipatti.	*Scrophulariaceae*	**-**

26	*Senna uniflora (*Mill.)H.S.Irwin & Barneby	One leaf senna	-	*Leguminosae*	**-**
27	*Senna tora (*L.) Roxb.	Stinking Cassia	Panwar	*Leguminosae*	**-**
28	*Sida acuta*L.	Common Wireweed	Baraira	*Malvaceae*	**-**
29	*Sida cordata* (Burm.f.) Borss.Waalk	Long stalked sida	Bhuinii	Malvaceae	**-**
30	*Sida rhombifolia* L.	Sahadeva	-	*Malvaceae*	
31	*Spermacoce hispida* L.	Shaggy Buttonweed	Madanaghanti	*Rubiaceae*	**-**
32	*Spilanthes acmella* (L.) L.		Akarkar	*Compositae*	**-**
33	*Tephrosia purpurea* (L.) Pers	Common Tephrosia	Sharpunka	*Leguminosae*	**-**
34	*Tridax procumbens* L		Kanphuli	*Compositae*	**-**
35	*Triumfetta rhomboideae* Jacq.	Burr Bush,	Chikti	*Malvaceae*	**-**
36	*Xanthium strumarium* L.	Cocklebur	Chota Dhatura,	*Asteraceae*	**-**

Source: *Field survey, Interaction with local people*

(iv) GRASS LANDS

No prominent grass land ecosystem was found in the study area. However, the grass lands were mixed with natural vegetation forest patches in low lands and the cultivable waste lands are now being utilized as grazing grounds to the livestock species. The grass land species of the study area are presented below in tables.

Table List of Grasslands in Core Zone

	Botanical name	**Engligh name**	**Common /Hindi name**	**Name of class/Family**	**Ecological sensitivity status REET**
1	*Apluda mutica* L.	Mauration grass	Tachula	*Poaceae*	**-**
2	*Aristida setacea* Retz.	Broom grass	-	*Poaceae*	**-**
3	*Arundo donax L.*	Giant Reed	Baranal	*Poaceae*	**-**
4	*Bambusa arundinaceae* L.	Bamboo	Bambu	*Poaceae*	**-**
5	*Cynodon dactyl* (L.) Pers.	Bermuda grass	Durva	*Poaceae*	**-**
6	*Dactyloctenium aegyptium* (L.) Willd.	Crow foot grass	-	*Poaceae*	**-**

7	*Eleusine indica* Gaertn.		Pandur	Poaceae	**-**
8	*Eragrostis amabilis* (L.) Wight &Arn.	Love grass	Bilaayateejau	*Poaceae*	**-**
9	*Heteropogon contortus* (L.) P.Beauv. ex Roem. &Schult.	Spear grass,	Kher, Kumryaghas	*Poaceae*	**-**
10	*Imperata cylindrical* (L.) Raeusch	Cogon grass	-	*Poaceae*	_
11	*Oplismenus hirtellus* (L.)P.Beauv.	Basket grass	-	*Poaceae*	**-**
12	*Panicum proliferum* Lamk	-	Panga	*Poaceae*	**-**
13	*Setaria verticillata* (L.) P. Beauv.	*Bristly fox tail*		*Poaceae*	**-**

Source: *Field survey, Interaction with local people*

Table List of Grasslands in Buffer Zone

Sl. No	**Botanical name**	**Englih name**	**Common /Hindi name**	**Name of class/Family**	**Ecological sensitivity status REET**
1	*Apluda mutica* L.	Mauration grass	Tachula	*Poaceae*	**-**
2	*Aristida setacea* Retz.	Broom grass	-	*Poaceae*	**-**
3	*Arundo donax L.*	Giant Reed	Baranal	*Poaceae*	**-**
4	*Bambusa arundinaceae* L.	Bamboo	Bambu	*Poaceae*	**-**
5	*Cynodon dactyl* (L.) Pers.	Bermuda grass	Durva	*Poaceae*	**-**
6	*Dactyloctenium aegyptium* (L.) Willd.	Crow foot grass	-	*Poaceae*	**-**
7	*Eleusine indica* Gaertn.		Pandur	Poaceae	**-**
8	*Eragrostis amabilis* (L.) Wight &Arn.	Love grass	Bilaayateejau	*Poaceae*	**-**
9	*Heteropogon contortus* (L.) P.Beauv. ex Roem. &Schult.	Spear grass,	Kher, Kumryaghas	*Poaceae*	**-**
10	*Imperata cylindrical* (L.) Raeusch	Cogon grass	-	*Poaceae*	_
11	*Oplismenus hirtellus* (L.)P.Beauv.	Basket grass	-	*Poaceae*	**-**
12	*Panicum proliferum* Lamk	-	Panga	*Poaceae*	**-**

13	*Setaria verticillata* (L.) P. Beauv.	*Bristly fox tail*		*Poaceae*	**-**

Source: *Field survey, Interaction with local people*

(v) PLANTATIONS AND AGRO-FORESTRY SPECIES

The agro forestry species developed in vacant farm lands and barren areas as a means of preserving or enhancing the productivity of the land. It combines shrubs and trees of local varieties in agricultural and forestry technologies to create more diverse, productive, profitable, healthy, ecologically sound, and sustainable land-use systems. The agro forestry species planted by WCL are Imli (*Tamarindus indicus*) and Amla(*Phyllanthus emblica* L.) .

Aquatic Flora

Aquatic flora are identified by inspecting River, Nala and small ponds of the study area. There are no perennial water bodies present in the Core Zone, therefore aquatic Flora is not present.

The water bodies present in Buffer Zone are Wardha River, Shrina Nallah, Koradi nallah, Kund Nala and Kondha Nala. Aquatic Flora present in the Buffer Zone are listed in table below.

Table List of Aquatic flora in the Buffer zone

Sl.No	Botanical name	Englih name	Common /Hindi name	Name of class/Family	Ecological sensitivity status REET
1	*Colocasia esculenta* (L.) Schott	Taro	Arvi, Kachalu	*Araceae*	**-**
2	*Cyperus articulatus* Linn	Jointed flat sedge		*Cyperaceae*	**-**
3	*Cyperus corymbosus* Rottb.		Nagar motha	*Cyperaceae*	**-**
4	*Hygrophila ringens* (L.) R. Br. ex Spreng.	Wild hygrophila		*Acanthaceae*	**-**
5	*Ipomoea aquatic* Forssk.	Water Morning Glory	Nali	*Convolvulaceae*	**-**
6	*Marsilea quadrifolia* L.	Four leaved clover	Caupatiya	*Marsiliaceae*	**-**
7	*Monochoria vaginalis* (Burm.f.) C.Presl	Nanka	Panpatta	*Pontedraceae*	

8	*Nymphaea nouchali* Burm f	Water lily	Neelkamal	*Nymphaeaceae*	-
9	*Phyla nodiflora* (L.) Grene	Jalapippali	bukkan	*Verbenaceae*	-
10	*Typha domingensis* Pers.	southern cattail	Patera	*Typhaceae*	-

Source: *Field survey, Interaction with local people*

The aquatic flora of the survey area is of common type and there are no rare and endangered species found in the core and buffer zone.

Green Belt Development

Creation of a greenbelt with local species will enhance the project area. The greenbelt should be developed around the mining area, infrastructure sites, service building area and township besides avenue plantation on both sides of the roads.

The purpose of a green belt around the mining site is to capture the fugitive emissions, attenuate the noise generated and improve aesthetics. Green vegetation cover is beneficial in many ways in terms of conservation of biodiversity, retention of soil moisture, recharge of ground water and maintaining pleasant microclimate of the region. In addition, vegetation cover can also absorb pollutants from the environment and helps in effective pollution control.

The list of species recommended for green belt development are presented below. Apart from this, it is suggested that concerned forest department may be consulted for planting of native species for green belt development.

Table List of Plants recommended for green belt development/ land reclamation

Common Name	Family Name	Botanical Name
Amla	*Phyllanthaceae*	Phyllanthus emblica
Babool	*Leguminosae*	*Acacia nilotica* (L.) Willd ex Delile
Neem	*Meliaceae*	*Azadirachta indica* (L.) A.Juss.
Bamboo	*Bombacaceae*	*Bambusa arundinaceae* L.
Polash	*Leguminosae*	*Butea monosperma* (Lam.) Taub.
Avenue cassia	*Leguminosae*	*Cassia siamia* Lamk.
Seasam	*Leguminosae*	*Dalbergia sissoo* Roxb. ex DC
Gulmohur	*Leguminosae*	*Delonix regia* (Boj. ex Hook) Raffin
Silk cotton	*Bombacaceae*	*Ceiba pentandra* (L.) Gaertn
Coral tree	*Leguminosae*	*Erythrina indica* Lam.
Silver oak	*Proteaceae*	*Grevillea robusta* A.Cunn ex R.Br.
Bitter orange	*Rutaceae*	*Citrus aurantium* L.
Subabol	*Leguminosae*	*Lucina leucophloea* (Lamk) de wit
Jungle Jilepe	*Leguminosae*	*Pithecellobium dulce* L.
Karanj	*Leguminosae*	*Pongamia pinnata* (L.) Pierre

Common Name	Family Name	Botanical Name
Kusum	*Sapindaceae*	*Schleichera oleosa* (Lour.) Oken.
Sal	*Dipterocarpaceae*	*Shorea robusta* Gaertn f
Teak	*Verbenaceae*	*Tectona grandis* L.

BASELINE STATUS OF FAUNA

Among the faunal groups avian fauna of terrestrial inhabitants of passerine category birds are conspicuous in grass lands (degraded forest) within the study area of the project.

The domesticated animals like Goat (*Capra aegagrus*); Buffalo (*Bubalus bubalis*); Cow (*Bos primigenius*), Cat (*Felis catus*), and Dog (*Canis lupus familiaris*) were found in villages.

The aquatic habitats consist of River, Nala, Ponds; Ditches and water-logged areas represented by fin-fish (fishes) of seasonal varieties.

Table List of Terrestrial Fauna in in the Core Zone

Sl. No.	Name			Scheduled Status (WAP, 1972)	ICUN Status
	Scientific	English	Common / Hindi		
Mammal					
1	*Bandicota bengalensis*	Bandicoot Rat	Chuha	IV	LC
2	*Canis aureus*	Jackal	Geedhad	II	LC
3	*Felis chaus*	Jungle Cat	Jangli Billi	II	LC
4	*Funambulus pennant*	3 Strip Palm squirrel	Gilahari	IV	LC
5	*Macaca mulatta*	Monkey	Bandar	II	LC
6	*Mus booduga*	Indian Field Mouse	Chuha	IV	LC
7	*Rattus rattus*	Common House Rat	Chuha	IV	LC
8	*Semnopithecus dussumieri*	Hanuman	Langur	-	LC
Birds					
1	*Acridotheres tristis*	Common Myna	Myna	IV	LC
2	*Apus affinis*	House Swift	Babeela	IV	LC
3	*Ardeola grayii*	Indian pond heron	Andha bagula	IV	LC
4	*Bubulcus ibis*	Cattle egret	Bagula	IV	LC
5	*Corvus splendens*	House Crow	Kauva	IV	LC
6	*Centropus sinensis*	Crow pheasant	Couckoo	IV	LC

Sl. No.	Name			Scheduled Status (WAP, 1972)	ICUN Status
	Scientific	English	Common / Hindi		
7	*Columbia livia*	Pigeon	Kabutar	IV	LC
8	*Egretta garzetta*	Little egret	Kilchia Bagla	IV	LC
9	*Eudynamys scolopacea*	Koel	Koyal	IV	LC
10	*Milvus migrans*	Black kite	Cheel	IV	LC
11	*Passer domesticus*	House sparrow	Gauriyya	IV	LC
12	*Psittacula krameri*	Rose ringed parakeet	Tota	IV	LC
13	*Pycnonotus cafer*	Red-vented bulbul	Bulbul	IV	LC
14	*Streptopelia chinensis*	Spotted Dove	Kabutar	IV	LC
15	*Sturnus contra*	Asian pied starling	Maina	IV	LC
Reptile					
1	*Bungamus caeruleus*	Common Krait	Sanmp	IV	LC
2	*Calotes versicolor*	Garden lizard	Girgit	IV	LC
3	*Enhydris enhydris*	Smooth water snake	Sanmp	IV	LC
4	*Hemidactylus sp.*	House lizard	Chipkali	IV	LC
5	*Naja Naja*	Cobra	Cobra	II	LC
6	*Natrix piscator*	Common water snake	Sanmp	II	LC
7	*Ptyas mucosus*	Rat snake	Sanmp	IV	LC
8	*Vipera russeli*	Russel's viper	Sanmp	II	LC
Amphibian					
1	*Bufo melanostictus*	Common toad	Medhak	IV	LC
2	*Euphlyctis hexadactyla*	Common frog	Medhak	IV	LC
3	*Rana hexadactyla*	Green pond frog	Medhak	IV	LC
4	*Rana tigrina*	Indian bull frog	Medhak	IV	LC
Insects					
1	*Anisoptera*	Dragon flies	Vyaadh-Patang	IV	LC
2	*Antheria mylita*	Moth	Phulpakharu	IV	LC
3	*Bacillus rossii*	Grasshopper	Tidda	IV	LC
Butteflies					

Sl. No.	Name			Scheduled Status (WAP, 1972)	ICUN Status
	Scientific	English	Common / Hindi		
1	*Catopsilia pomona (Fabricius)*	Common Emigrant	Titli	NA	NE
2	*Tirumala limniace leopardus (Butler)*	Blue Tiger	Titli	NA	NE

Source: *Field survey, Interaction with local people*

Buffer Zone

Table List of Terrestrial Fauna in the Buffer Zone

Sl. No.	Name			Scheduled Status (WAP, 1972)	ICUN Status
	Scientific	English	Common / Hindi		
Mammal					
1	*Bandicota bengalensis*	Bandicoot Rat	Chuha	IV	LC
2	*Canis aureus*	Jackal	Geedhad	II	LC
3	*Felis chaus*	Jungle Cat	Jangli Billi	II	LC
4	*Funambulus pennant*	3 Strip Palm squirrel	Gilahari	IV	LC
5	*Herpestes edwardsi*	Common Mongoose	Nevlaa	II	LC
6	*Lepus nigricollis*	Indian Hare	Khargosh	IV	LC
7	*Macaca mulatta*	Monkey	Bandar	II	LC
8	*Mus booduga*	Indian Field Mouse	Chuha	IV	LC
9	*Rattus rattus*	Common House Rat	Chuha	IV	LC
10	*Semnopithecus dussumieri*	Hanuman	Langur	-	LC
11	*Vulpes bengalensis*	Indian Fox	Lomri	II	LC
Birds					
1	*Acridotheres tristis*	Common Myna	Myna	IV	LC
2	*Alcedo atthis*	Small blue kingfisher	Ramchiraya	IV	LC
3	*Apus affinis*	House Swift	Babeela	IV	LC
4	*Ardeola grayii*	Indian pond heron	Andha bagula	IV	LC
5	*Bubulcus ibis*	Cattle egret	Bagula	IV	LC

Sl. No.	Name			Scheduled Status (WAP, 1972)	ICUN Status
	Scientific	English	Common / Hindi		
6	*Corvus splendens*	House Crow	Kauva	IV	LC
7	*Centropus sinensis*	Crow pheasant	Couckoo	IV	LC
8	*Columbia livia*	Pigeon	Kabutar		LC
9	*Dinopium benghalensis*	Wood pecker	Sutar	IV	LC
10	*Egretta garzetta*	Little egret	Kilchia Bagla	IV	LC
11	*Eudynamys scolopacea*	Koel	Koyal	IV	LC
12	*Francolinus picyus*	Painted partirideg	Kala teetar	IV	LC
13	*Gracula religiosa*	Bastar Hill Myna	Kali Myna	IV	LC
14	*Milvus migrans*	Black kite	Cheel	IV	LC
15	*Passer domesticus*	House sparrow	Gauriyya	IV	LC
16	*Psittacula krameri*	Rose ringed parakeet	Tota	IV	LC
18	*Pycnonotus cafer*	Red-vented bulbul	Bulbul	IV	LC
19	*Streptopelia chinensis*	Spotted Dove	Kabutar	IV	LC
20	*Sturnus contra*	Asian pied starling	Maina	IV	LC
21	*Turdoides caudatus*	Common Babbler	Gaigai	IV	LC
22	*Vanellus indicus*	Red-wattled lapwing	Titeeri	IV	LC
Reptile					
1	*Bungamus caeruleus*	Common Krait	Sanmp	IV	LC
2	*Calotes versicolor*	Garden lizard	Girgit	IV	LC
3	*Enhydris enhydris*	Smooth water snake	Sanmp	IV	LC
4	*Hemidactylus sp.*	House lizard	Chipkali	IV	LC
5	*Naja Naja*	Cobra	Cobra	II	LC
6	*Natrix piscator*	Common water snake	Sanmp	II	LC
7	*Ptyas mucosus*	Rat snake	Sanmp	IV	LC
8	*Varanus monitor*	Monitor lizard	Ghorpad	II	LC

Sl. No.	Name			Scheduled Status (WAP, 1972)	ICUN Status
	Scientific	English	Common / Hindi		
9	*Vipera russeli*	Russel's viper	Sanmp	II	LC
Amphibian					
1	*Bufo melanostictus*	Common toad	Medhak	IV	LC
2	*Euphlyctis hexadactyla*	Common frog	Medhak	IV	LC
3	*Rana hexadactyla*	Green pond frog	Medhak	IV	LC
4	*Rana tigrina*	Indian bull frog	Medhak	IV	LC
Insects					
1	*Anisoptera*	Dragon flies	Vyaadh-Patang	IV	LC
2	*Antheria mylita*	Moth	Phulpakharu	IV	LC
3	*Bacillus rossii*	Grasshopper	Tidda	IV	LC
Butteflies					
1	*Catopsilia pomona (Fabricius)*	Common Emigrant	Titli	NA	NE
2	*Tirumala limniace leopardus (Butler)*	Blue Tiger	Titli	NA	NE

Source: *Field survey, Interaction with local peoples etc*

Aquatic Fauna of Core Zone

Aquatic flora and fauna are identified by inspecting River, Nala and small ponds of the study area. Perenneal water bodies (river, nala) are not present in core zone, therefore aqualtic fauna is not present.

Aquatic Fauna of Buffer Zone

Aquatic flora and fauna in the buffer zone are identified by inspecting River, Nala and small ponds of the study area such as Wardha River, Shirna Nallah etc are presented below in table.

Table List of Aquatic Fauna in the Buffer Zone

Sl. No.	Name			Scheduled Status (WAP, 1972)	ICUN Status	Zone	
	Scientific	English	Common / Hindi			Core	Buffer
1	*Catla catla*	Catla	Murrai	NA	LC	+	+
2	*Channa punctatus*	Spotted murrel	Maggri	NA	LC	+	+
3	*Clarias batrachus*	Magur	Boyi	NA	LC	+	+
4	*Labeo rohita*	Rohu	Rohu	NA	LC	+	+

Source: *Field survey, Interaction with local peoples and Available literature*

Secondary Data Source:

- Discussion with local people and Project Authorities.
- IUCN Red Data Book

CONCLUSION

During survey it is observed that, areas which are important or sensitive for ecological reasons – geological formations, dunes, beaches, coral reefs, mangroves and swamps are not present within the study area. Also, areas used by protected, important or sensitive species of flora and fauna are not present within the study area.

The land will undergo changes during mining. The biologically reclaimed land will improve the green cover in the area and help in biodiversity conservation. As already, the mining activities are going on in the area.

Summary of Flora Fauna Study Details (Post Monsoon 2013)

The baseline data on flora & fauna generated in Post Monsoon Season, 2013 for the nearby Juna-Kunada OC of Majri Area is detailed below:

Table Flora of Core Zone

Flora	Local Name	Botanical Name	Family
Agricultural crops			
Cereals	Makka (Maize)	*Zea mays*	Poaceae
	Jawas	*Linum usitatissimum*	Linaceae
Pulses	Tuar	*Cajanus cajan*	Fabaceae
	Mung	*Phaseolus mungo*	Fabaceae
Commercial crops / Cash Crops			
	Aloo (Sweet Potato)	*Ipomoea batatas*	Convolvulaceae

Flora	Local Name	Botanical Name	Family
Vegetables	Onion/ Kanda	*Allium cepa*	-
	Baigan	*Solanum melongena*	Solanaceae
	Tamator (Tomato)	*Lycopersicum esculentum*	Solanaceae
	Bean	*Lablab purpureus*	Leguminosae
	Band Gobi (Cobbage)	*Brassica spp.*	Cruciferae
	Bhindi	*Abelmoschus esculentus*	Malvaceae
	Pumpkin	*Cucurbeta moschata*	Cucurbetaceae
	Karela	*Momordica charantia*	Cucurbetaceae
Oil yielding plants	Sarson (Mustard)	*Brassica compestris*	Brassicaceae
Cash Crops	Arandi	*Ricinus communis*	Euphorbiaceae
	Kappas	*Gossypium hirsutum*	Malvaceae
Spices	Dhaniya	*Coriandrum sativum*	Umbelliferae
	Lahsun (Garlic)	*Allium stivum*	Liliaceae
	Mirchi	*Capsicum annum*	Solanaceae
	Haldi (Turmeric)	*Curcuma domestica*	Zinziberaceae
Fruits	Jam (Guava)	*Psidium guajava*	Myrataceae
	Bor	*Ziziphus mauritiana*	Rhamnaceae
	Jackfruit (Kathal)	*Artrocarpus hetarophylla*	Moraceae
	Bel	*Aegl marmalas*	Rutaaceae
	Jambhul/Jamun	*Syzygium cumini*	Myrtaceae
	Amba	*Magnifera indica*	Anacardiaceae
	Lemon	*Citrus Lemon*	Rutaceae
	Sitaphal	*Annona squamosa*	Annonaceae
Plantation			
Planted by WCL	Ashok	*Sarracca indica*	-
	Neem	*Azadirachta indica*	Meliaceae
	Karanj	*Pongamia pinnata*	Fabaceae
	Babul	*Acacia nilotica*	Fabaceae
Natural vegetation / Forest type			
Herbs	Tulsi	*Ocimum sancturm*	*Lamiaceae*
	Bhui neem	*Andrographis paniculata*	Acanthaceae
	Gajar gawat	*Parthenium hysterophorus*	Compositeae
	Dhudhi	*Euphorbia hirta*	Euphorbiaceae
Shrubs	Katumbar	*Ficus hispida*	Moraceae
	Arandi	*Ricinus communis*	Euphorbiaceae
	Bhor	*Ziziphus jujuba*	Rhamnaceae
Trees	Sagwan	*Tectona grandis*	Verbenaceae
	Amba	*Magnifera indica*	Anacardiaceae
	Sisam	*Dalbergia sissoo*	Fabaceae
	Karanj	*Pongamia pinnata*	Fabaceae
	Peepal	*Ficus religiosa*	Moraceae
	Maharukh	*Ailanthus excelsa*	Simarubiaceae

Flora	Local Name	Botanical Name	Family
	Ashok	*Sarracca indica*	-
	Neem	*Azadirachta indica*	Meliaceae
	Arjun	*Terminalia arjuna*	Combretaceae
Endangered species	Nil	Nil	Nil
Endemic species	Nil	Nil	Nil

Table Flora of Buffer Zone

Flora	Local Name	Botanical Name	Family
Agricultural crops			
Cereals	Dhan (Paddy)	*Oryza sativa*	Poaceae
	Makka (Maize)	*Zea mays*	Poaceae
	Jewas	*Linum usitatissimum*	Poaceae
	Ragi (Mundua)	*Eleusine coracana*	Poaceae
Pulses	Urad (Black Gram)	*Vigna mungo*	Fabaceae
	Chana	*Cicer arietinum*	Fabaceae
	Tuar (Red Gram)	*Cajanus cajan*	Fabaceae
	Kulthi (Horse Gram)	*Dilichos biflorus*	Fabaceae
	Mung (Green Gram)	*Vigna radiata*	Fabaceae
Commercial crops			
Vegetables	Baigan	*Solanum melongena*	Solanaceae
	Aloo (Sweet Potato)	*Ipomoea batatas*	Convolvulaceae
	Kanda (Onion)	*Allium cepa*	
	Tamator (Tomato)	*Lycopersicum esculentum*	Solanaceae
	Bean	*Lablab purpureus*	Leguminosae
	Band Gobi (Cobbage)	*Brassica spp.*	Cruciferae
	Bhindi	*Abelmoschus esculentus*	Malvaceae
	Jhinga	*Luffa acutangula*	Cucurbetaceae
	Karela	*Momordica charantia*	Cucurbetaceae
	Kohra	*Benincasa hispida*	Cucurbetaceae
	Kundri	*Coccinia grandis*	Cucurbetaceae
	Kaddu	*Hibiscus esculentus*	Malvaceae
	Nenua	*Luffa cylindrica*	Cucurbetaceae
	Kheera	*Cucumis stiva*	Cucurbetaceae
	Kheera	*Cucrbaltus sativus*	Cucurbetaceae
	Phool Gobi	*B. oleracea var, botrytis*	Cruciferae

Flora	Local Name	Botanical Name	Family
	Muli	*Raphanus sativus*	Cruciferae
Oil yielding plants	Sarson (Mustard)	*Brassica compestris*	Brassicaceae
	Arandi	*Ricinus communis*	Euphorbiaceae
	Soyabean	*Glucine max*	Fabaceae
Cash Crops	Soyabean	*Glucine max*	Fabaceae
	Kappas	*Gossypium hirsutum*	Malvaceae
Spices	Mirch (Capsicum)	*Capsicum species*	Solanaceae
	Dhaniya	*Coriandrum sativum*	Apiaceae
	Lahsun (Garlic)	*Allium stivum*	Alliaceae
	Haldi (Turmeric)	*Curcuma domestica*	Zingiberaceae
	Adrak (Ginger)	*Zingiber officinale*	Zingiberaceae
Fruits	Aam	*Magnifera indica*	*Anacardiaceae*
	Anar	*Punica granatum*	*Lythraceae*
	Amrud (Guava	*Psidium guajava*	Myrataceae
	Jamun (Black Berry)	*Sysygium jambolana*	*Myrtaceae*
	Kathal (Jackfruit)	*Articarous heterophyllus*	Moraceae
	Bel	*Angle marmelos*	Rutaaceae
	Papaya	*Carica papaya*	Caricaceae
Plantation			
Planted by WCL	Shisam	*Dalbergia sisso*	*Leguminosae*
	Mango	*Magnifera indica*	*Anacardiaceae*
	Amaltas	*Casia fistula*	*Leguminosae*
	Kathal (Jackfruit)	*Articarous heterophyllus*	Moraceae
	Gulmohar	*Delonix regia*	Caesalpiniaceae
	Arjun	*Terminalia arjuna*	*Combretaceae*
	Babul	*Acasia nilotica*	*Momoseae*
	Karanj	*Pongamia pinnata*	Fabaceae
	Sagwan	*Tectona grandis*	Verbenaceae
Natural vegetation / Forest type			
Trees (Top Story)	Karanj	*Pongamia pinnata*	Fabaceae
	Sitaphal	*Annona squamosa*	Annonaceae
	Bija	*Pterocarpus marsupium*	Leguminosae
	Katang bamboo	*Bambusa arundinacea*	Graminae
	Aam	*Mangifera indica*	Anacardiaceae
	Bhilma	*Semicarpus ancardium*	Anacardiaceae
	Mohwai	*Lannea coromandelica*	Anacardiaceae
	Ashok	*Polythia longifolia*	-

Flora	Local Name	Botanical Name	Family
	Gulmohor	*Delonix regia*	Caesalpiniaceae
	Apta	*Bauhinia racemosa*	Leguminosae
	Chinch (Imli)	*Tamarindus indica*	Leguminosae
	Dhawda	*Anogiessus latifolia*	Combretaceae
	Ain	*Terminalia alata*	Combretaceae
	Arjun/kahu	*T. arjuna*	Combretaceae
	Behada	*T. bellarica*	Combretaceae
	Tendu	*Diospyros melanoxylon*	Ebenaceae
	Awla	*Phyllanthus emblica*	Euphorbiaceae
	Palas	*Butea monosperma*	Leguminosae
	Sisam	*Dalbergia sissoo*	Leguminosae
	Khair	*A. catechu*	Leguminosae
	Hiwar	*A. leucophloea*	Leguminosae
	Babul	*A. nilotica*	Leguminosae
	Sirish	*Albizzia lebbeck*	Leguminosae
	Sagwan	*Tectona grandis*	Verbenaceae
	Wad	*Ficus benghalensis*	Urticaceae
	Neem	*Azadirachta indica*	Meliaceae
	Pimpal	*F. religiosa*	Moraceae
	Shevga	*Moringa oleifera*	Moringaceae
	Sirish	*A. procera*	Leguminosae
	Jambhul/jamun	*Syzygium cumini*	Myrtaceae
	Bel	*Aegle marmelos*	Rutaceae
	Kumbhi	*Careya arborea*	Myrtaceae
	Limbu	*Citrus aurantifolia*	Rutaceae
	Austrelian babul	*Acacia auriculoformis*	Mimosaceae
Herbs (Lower Story)	Kukada	*Celosia argentia*	-
	Aradhi	*Achyranthus aspera*	-
	Amaltas	*Cassia fistula*	Leguminosae
	Tarota	*C tora*	-
	Kamarmodi	*Tridax procumbens*	*Astraceae*
	Gajar gawat	*Parthenium hysterophorus*	*Astraceae*
	Tulsi	*Ocimum basilicum*	Lamiaceae
	Ratantulsi	*O.bassilicum*	Lamiaceae
	Kala dhotra	*Datura metal*	Solanaceae
	Ratrani	*Cestrum nocturnum*	Solanaceae
	Gokhru	*Tribulus teristris*	Zygophyllaceae
Shrubs	Pandra kuda	*Holarrhena antidysenterica*	*Apocynaceae*

Flora	Local Name	Botanical Name	Family
(Middle Story)	Kanher	*Nerium indicum*	-
	Bharati	*Maytenus emarginata*	Celastraceae
	Ratanjyoti	*Jatropha gossypifolia*	Euphorbiaceae
	Katumbar	*Ficus hispida*	Moraceae
	Lokhandi	*Ventilago denticulata*	Rhamnaceae
	Bhor	*Ziziphus jujuba*	Rhamnaceae
	Eroni	*Z. oenoplia*	Rhamnaceae
	Mehndi	*Lowsonia immermis*	-
	Nirgundi	*Vitex nigunda*	-
Climbers	Amar vel	*Cuscuta reflexa*	Convolvulaceae
	Indrayani	*Citrullus calexynthis*	-
	Jangli kundru	*Cephalandra indica*	Cucurbitaceae
	Dudhi	*Cryptolepis buchanani*	Periplocaceae
	Rabarachavel	*Cryptostegia grandiflora*	Asclepiadaceae
	Arasphari	*Olax scandens*	Periplocaceae
Grasses	Doob	*Cynodon dactylum*	Gramineae
	Bans/Bamboo	*Dendrocalamus strictus*	Gramineae
	Sabai	*Eulaliopsis binata*	Gramineae
	Munj	*Sacchanum munja*	Gramineae
	Jharoo grass	*Thysanolaena agrostis*	Gramineae
	Chor kanta	*Chrysopogon auciculatus*	Gramineae
Endangered species	Nil	Nil	
Endemic species	Nil	Nil	

Table Fauna of Core Zone

Fauna	Common Name	Zoological Name
LISTED UNDER WILDLIFE PROTECTION ACT,1972		
Terrestrial Fauna		
Schedule-I	Nil	-
Schedule-II	Nil	-
Schedule-III	Nil	-
Sch.-II, Part II, Sec. 2C	Jungle cat	Felis chaus
Schedule-IV, Section 6A	Indian Grey Mongoose	Herpestes edwardsi
Schedule-V, Section 6, Section 3	Indian Mouse	Bandicota bengalensis
	House rat	Rattus rattus
Schedule-V, Section 3	Fulvous Fruit Bat	Rousettus Leschenaulti

Fauna	Common Name	Zoological Name
Amphibians & Reptiles		
Schedule-II	Nil	Calotes verosicolor
Schedule-IV	Toad	Bufo melanostictus
Avi Fauna		
Schedule-IV, Section 11	Bhagule	Ardea purpurea
	Koel	Eudynamys scolopacea
	Kabutar	Columbia livia
	House swift	Apus affinis
	Titavi	Vanellus indicus
	Bhardwaj	Centropus sinesis
	Pandubi	Prodiceps ruficollis
Schedule-V	Kavvwa	Corvus splendens,
NOT LISTED UNDER WILDLIFE PROTECTION ACT,1972		
Mammals / (Domestic Animals)	Goat	Capra species
	Bull	Bos indicus
	Cow	Bos indicus
	Buffalo	Bubalus bubalis
Birds	Tota (Parrot)	Pisttaculus krameri
Aquatic fauna	Marad	Channa punctatus
	Magur	Clarias batrachus
	Katla	Catla catla
Invertebrates	Cockroach	Blata orientalis
	Madhumakkhi	Apis indica
	Tilchatta	Blata orientails
	Chinti	Solpopsis Spp.
	Honey bee	Apis dorsata
	Lahi	Kerria laxxa
	Birni	Polistis Spp.
	Jugnu	Photinus Spp.
	Gojar	Scolopendra Spp.
ENDANGERED SPECIES	Nil	-
ENDEMIC SPECIES	Nil	-
MIGRATORY SPECIES	Nil	-

Table Fauna of Buffer Zone

Fauna	Common Name	Zoological Name
LISTED UNDER WILDLIFE PROTECTION ACT,1972		
Terrestrial Fauna		
Schedule-I	Nil	-
Schedule-II	Lomdi (Common Fox)	Vulpes bengalensis
	Siyar (Jackal)	Vulpes vulpes
	Jungle Cat	Felis chaus
	Common langur	Presbytis chtellus
	Ban suar	Sus scrofa

Fauna	Common Name	Zoological Name
Schedule-IV	Mongoose	Herpestes edwardsi
	Squirrel	Funambulus pennanti
	House Rat	Rattus species
	Mice	Mus Musculas
Schedule-V, Section 3	Fulvous Fruit Bat	Rousettus Leschenaulti
Amphibians & Reptiles		
Schedule-II	Common Garden Lizards	Varanus species
	Cobra	Naja species
	Dhamon or Rat Snake	Ptyas Mucosus
Schedule-IV	Tode	Bufo melanostictus
	Karait	Bungurus Caeruleaus
	Water snake	Natrix piscator
	Dhorwa	Natrix Sp.
Avi Fauna		
Schedule-IV, Section 11	House swift	Apus affinis
	Bhagule	Ardea purpurea
	Koel	Eudynamys scolopacea
	Kabutar	Columbia livia
	Titavi	Vanellus indicus
	Bhardwaj	Centropus sinesis
	Pandubi	Prodiceps ruficollis
Schedule-V	Common Crow	Corvus splendens
NOT LISTED UNDER WILDLIFE PROTECTION ACT,1972		
Mammals (Domestic Animals)	Goat	Capra species
	Bull	Bos indicus
	Cow	Bos indicus
	Buffalo	Bubalus bubalis
	Dog	Canis familaris
	Sheep	Capra Sp.
	Pig	Sus scrofa
	Horse	Equus Sp,
Birds (Domestic Birds)	Sparrow	Passer domesticus
	Duck	Nettopus Coromandelianus
Fauna	Common Name	Zoological Name
Amphibian	Frog	Rana Tigerina
	Tree frog	Hyle Spp.
	Flying frog	Rhacopnonis Spp.
Aquatic fauna (Fishes)	Rohu	Labco rohita
	Catla	Cyprindiae
	Garai	Channa punctatus
	Mangoor	Clarias batrachus
	Pothia	Punctius ticta
	Bokwa	Eutropichttys baacha
	Zebra fish	Danio rerio

Fauna	Common Name	Zoological Name
Invertebrates	Birni	Polistis Spp.
	Grosshopper	Hierogylphus banian
	Tidha	Schistocerca gregaria
	Moth	Antheria mylita
	Black Bee	Apis dorsata
	Bee	Apis indica
	Stem Borer	Chilo auricilia
	Cockroach	Blata orientalis
	Madhumakkhi	Apis indica
	Chinti	Solpopsis Spp.
	Lahi	Kerria laxxa
	Jugnu	Photinus Spp.
	Gojar	Scolopendra Spp.
Aquatic Insect	Daphnia	Nepa Spp.
	Prawn	Chaetogaster
ENDANGERED SPECIES	Nil	-
ENDEMIC SPECIES	Nil	-
MIGRATORY SPECIES	Tree Pipit	Anthus Trivialis
	Cuckoo	Cuculus Micropterus

Observation

The floristic component of the study area does not include any rare or endangered species. Thus, impact on rare and endangered species of flora is not envisaged. The project does not envisage destruction or displacement of any fauna species. Thus, indirect impact on fauna due to loss of habitat is not foreseen. However, it is reported that animals like Langur, Jangli Billi, Jackal, etc. enter into the agricultural field of the villages and need conservation.

New Majri UG to OC is an existing mine of WCL. The present proposal seeks expansion in production capacity and ML area. The additional area required is mostly agricultural land. No forest land is involved in the present project.

Common Species of Flora & Fauna observed in the study area are as follows:

Table Common Species of Flora

Flora	Local Name
Agricultural crops	
Cereals	Dhan , Makka
Pulses	Urad (Black Gram), Chhana, Tuar (Red gram), Kulthi (Horse Gram), Mung (Green Gram)
Commercial crops	
Vegetables	Baigan, Tamator, Cobbage, Bean, Jhinga, Kohra, Bhindi
Oil yielding plants	Sarson, Arandi etc
Spices	Mirch, Dhania, Adrak, Lahsun etc.

Fruits	Aam, Amrudh, Jamun, Papita, Kathal, Ber, Orange etc
Cash crops	Kappas, Soyabean
Natural vegetation / forest type	
Herbs	Amaltas, Dhudhi, Rantulsi, Ratrani etc
Shrubs	Ratanjoyati, Katumber, Lokhandi, Bhor etc
Trees	Aam, Sitaphal, Neem,Peepal, Mahua etc
Grasses	Baans, Doob,etc

Table Common Species of Fauna

SL. NO.	COMMON NAME	SCHEDULE
01.	House Rat	V
02.	Jackal	II
03.	Jungle Cat	II
04.	Fulvous Fruit Bat	V
05.	Common crow	V
06.	Common Langur	II

Results

From the above study, it is observed that there is no endangered and endemic species found in the area as per Red Book of Botanical Survey and Zoological survey of India as per Wild Life (Protection) Act 1972 and its subsequent amendments. The main agricultural crops of the village area under study is Rice and Maize. The major commercial crop grown here during the summer season is Lady Finger, Brinjal, Chilies, Onion, Beans, Karela etc. Plantation has been done by M/s WCL and Forest Department and is categorized as B-Type forest. The main constituents of forest are Palash, Sisam, Bel, Babul, Mango, Mahua, Jamun, Kathal, Neem etc. Trees of terminalla species were found, besides Palash, Sisam, Teak, Sal, Mango, Ashok, Kathal, Gulmohar etc. are planted and maintained by M/s WCL and Forest Department. The grass land vegetation mainly covered by Moraba, Chor kanta, Dubh, Munj species, Bans/Bamboo etc.

As there is B-Type forest, hence major fauna elements were absent in this area. Mainly Fox, Newla, Jungle Cat are observed/reported. No endemic and endangered species of fauna elements has been reported as per Wild Life (Protection) Act 1972 and its subsequent amendments. No migratory species and path/corridors have been found/reported in the area.

Hence, the flora fauna (Ecology Biodiversity) studies carried out during 2013 and 2019 shows no significant change has occured in flora fauna of the study area.

3.9 Supportive Carrying Capacity of The Riverine Ecosystem

Ground Water Draft

Table Gross Groundwater Draft for 'All Uses'

	GROUNDWATER DRAFT	Monsoon (120 days)	Non-monsoon (245 days)	Total
		M m^3	M m^3	M m^3
1	**Net irrigation use**			
i.	Proportional quantity for 1570 Ha area	0.00	**0.17**	**0.17**
2	**COMMUNITY USE**			
i.	Projected population (i.e. 2025 AD) = 55601	0.32	0.66	0.98
ii.	**Mine use (mine water & tubewell):**			
1	New Majri UG to OC	0.03	0.06	0.09
	New Majri II A OC	0.12	0.24	0.36
	Kolar Pimpri OC	0.10	0.20	0.30
	Junad OC	0.05	0.10	0.15
	Total	**0.30**	**0.60**	**0.90**
	Sub-Total (2(i)+2(ii))	***0.62***	***1.26***	***1.88***
3	**Net Annual Mine Discharge (M m^3)**	**Monsoon**	**Non-monsoon**	**Total**
i	New Majri UG to OC	0.51	1.05	1.56
	New Majri II A OC	0.83	1.69	2.52
	Kolar Pimpri OC	0.53	1.07	1.60
	Junad OC	0.41	0.85	1.26
Total Mine Pumping in the Area		2.28	4.66	6.94
Mine use		0.30	0.60	0.90
Total discharge after mine use		1.98	4.06	6.04
Net mine discharge in the area		**1.98**	**4.06**	**6.04**
Gross Annual Groundwater Draft for 'All uses' in Buffer Zone		***2.60***	***5.49***	***8.09***

Ground Water Recharge:

Table Rainfall Recharge in the study area by Rainfall Infiltration Method during Monsoon and Non-Monsoon Period

	Description of items	
1	**Area**	
	a. Sedimentary Area (km^2)	**314**
	i) Alluvium/Kamthi	284
	ii) Lametas	30
	b. Hard Rock Area (km^2)	**-**

	i) Basalt	-	
2	Average Rainfall (mm) during	1163.1	
	a. Monsoon season rainfall (mm) (June to Sept)	1017.5	
	b. Non-monsoon season rainfall (mm) (Oct to May)	145.6	
	c. Minimum threshold value of rainfall (mm)	116.31	
	d. Maximum threshold value of rainfall (mm)	3000	
3	Rainfall infiltration factor	Sedimentary	Hard Rock
		Alluvium/Kamthi- 0.15 Lameta – 0.06	-
4	Rainfall recharge in the study area by rainfall infiltration factor method		
	b. **Monsoon season (M m^3)** = [(1) * {(2d)-(2c)} *(3)/1000] if (2a) > (2d) = [(1) * {(2a)-(2c)} * (3)/1000] if (2a) <= (2d)	***40.01***	
	i) Sedimentary	Alluvium/ Kamthi – 38.39	
		Lameta - 1.62	
		Total – 40.01	
	ii) Hard Rock	-	
	b. **Non-monsoon season (M m^3)** = Nil if (2b) <= (2c) = [(1) * {(2b) - (2c)} * (3)/1000 if (2b) > (2c)]	***1.30***	
	i) Sedimentary	Alluvium/ Kamthi – 1.25	
		Lameta - 0.05	
		Total – 1.30	
	ii) Hard Rock	-	
	Gross Rainfall Recharge [a) + (b)]	***41.31***	

Table Rainfall Recharge in the study area by Water Table Fluctuation Method during monsoon season

Description of items		Sedimentary	
1	Area (km^2)	Alluvium/Kamthi	Lameta
		284	30
2	Water table fluctuation (m)	2.61	1.07
3	Specific yield	0.04	0.025
4	Change in groundwater storage [(1) * (2) * (3)] (M m^3)	29.65	0.80
5	**Total (M m^3)**	***30.45***	
6	Gross groundwater extraction for 'All Uses' during monsoon season (M m^3)	2.60	
7	Recharge from 'Other Sources' during monsoon season (M m^3)	0.46	
8	Gross Rainfall Recharge (M m^3) [(5) + (6)-(7)]	32.59	

Table Rainfall Recharge during Monsoon season after comparing results from Water Table Fluctuation Method and Rainfall Infiltration Factor Method during monsoon season

Description of items		Quantity
1	Rainfall Recharge during monsoon season	
	a. By Water Table Fluctuation Method (M m^3)	**32.59**
	b. By Rainfall Infiltration Factor Method (M m^3)	**40.01**
2	Difference between (1a) and (1b) expressed as a percentage of (1b), 'PD' $PD = \frac{[(1a)-(1b)]}{(1b)} * 100$	**-18.54%**
3	Rainfall Recharge in the study area during monsoon season after considering the 'PD'	**32.59**
	[= (1a) if 'PD' is between -20 and +20%	
	= 0.8 * (1b) if 'PD' is less than -20%	
	= 1.20 * (1b) if 'PD' is greater than +20%]	

Table Net Groundwater Availability in the study area

Description of items		M m^3
1	Rainfall Recharge in the study area	
	a. During Monsoon season (Rainfall Infiltration Method)	32.59
	b. During Non-monsoon season (Rainfall Infiltration Method)	1.30
	c. Annual [(1a) + (1b)]	**33.89**
2	Recharge from 'Other Sources'	
	a. During Monsoon season	0.46
	Return flow from Excess mine water [20% as seepage factor]	0.40
	Recharge through water bodies in the area	0.06
	b. During Non-monsoon season	0.96
	Return flow from Irrigation [20 % of Irrigation Draft]	0.03
	Return flow from Excess mine water [20% as a seepage factor]	0.81
	Recharge through water bodies in the area	0.12
	c. Annual [(2a) + (2b)] M m^3	**1.42**
3	Are Environmental Flows assessed (Yes/No)	No
4	Total Annual Groundwater Recharge [(1c) + (2c)]	**35.31**
5	Environmental flows in (M m^3)	**1.76**
	a. [0.05 * (4)] if response to (3) is "NO" and rainfall recharge during monsoon season computed by 'Water table Fluctuation Method'	1.76-
	b. [0.10 * (4)] if response to (3) is "NO" and rainfall recharge during monsoon season is "NOT" computed by 'Water table Fluctuation Method'	-

6	Net Annual Groundwater Availability in the study area [(4) – (5)] M m^3	**33.55**
7	Annual Gross Groundwater Draft for all uses in the study area	**8.09**
8	Balance Available Annual Groundwater Recharge (Net Annual Groundwater Availability – Gross Annual Groundwater Draft)	**25.46**

Table Stage of Groundwater Extraction in the study area

Description of items	Buffer Zone
1. Net Groundwater Availability (M m^3)	33.55
2. Annual Gross Groundwater Draft (M m^3)	8.09
3. Balance Available Annual Groundwater Recharge (M m^3)	25.46
4. Stage of Groundwater Extraction	**24.11%**

The present stage of ground water extraction in and around the project area is 24.11% which can be categorized as safe area. As per CGWB, Central Region, Nagpur the 'Stage of ground water extraction' in Bhadravati tehsil, in which mine is located is 10.37%.

3.10 Consideration of Existing Mine Discharge into the Wardha River

The entire quarriable area is covered by sedimentary rocks of Gondwana Super group. These formations may possess moderately high groundwater potential. The semi-consolidated Gondwana are mostly stratified formations underlying the Alluvium/soil. The permeable beds (Sandstone horizons) act as individual hydrogeological units and develop multi-aquifer system. As such under these circumstances, the groundwater flow/velocity along the bedding planes is higher than across the plane. It is imperative that horizontal hydraulic conductivity is many folds higher than the vertical hydraulic conductivity.

The opencast mine acts as large diameter well/sink resulted in by cutting /extraction of different aquifer zones/formations overlying the working coal seam. As soon as depression / pit is created due to mine cut, the initial discharge is generally heavy due to concentration of flow to that region thereby creating depletion/draw-down in water levels in the surrounding area and the inflow stabilizes due to partial desaturation. With increase in depth of incision, the semi-confined aquifer would also be exposed /punctured thereby the total system would be converted into water table condition and a cone of depression would be formed by the gravity drainage from different aquifer zones. In opencast mining, the

unconfined aquifer is the most affected and the semi confined aquifer is least affected. The mine influence is directly proportional to the mine area and depth.

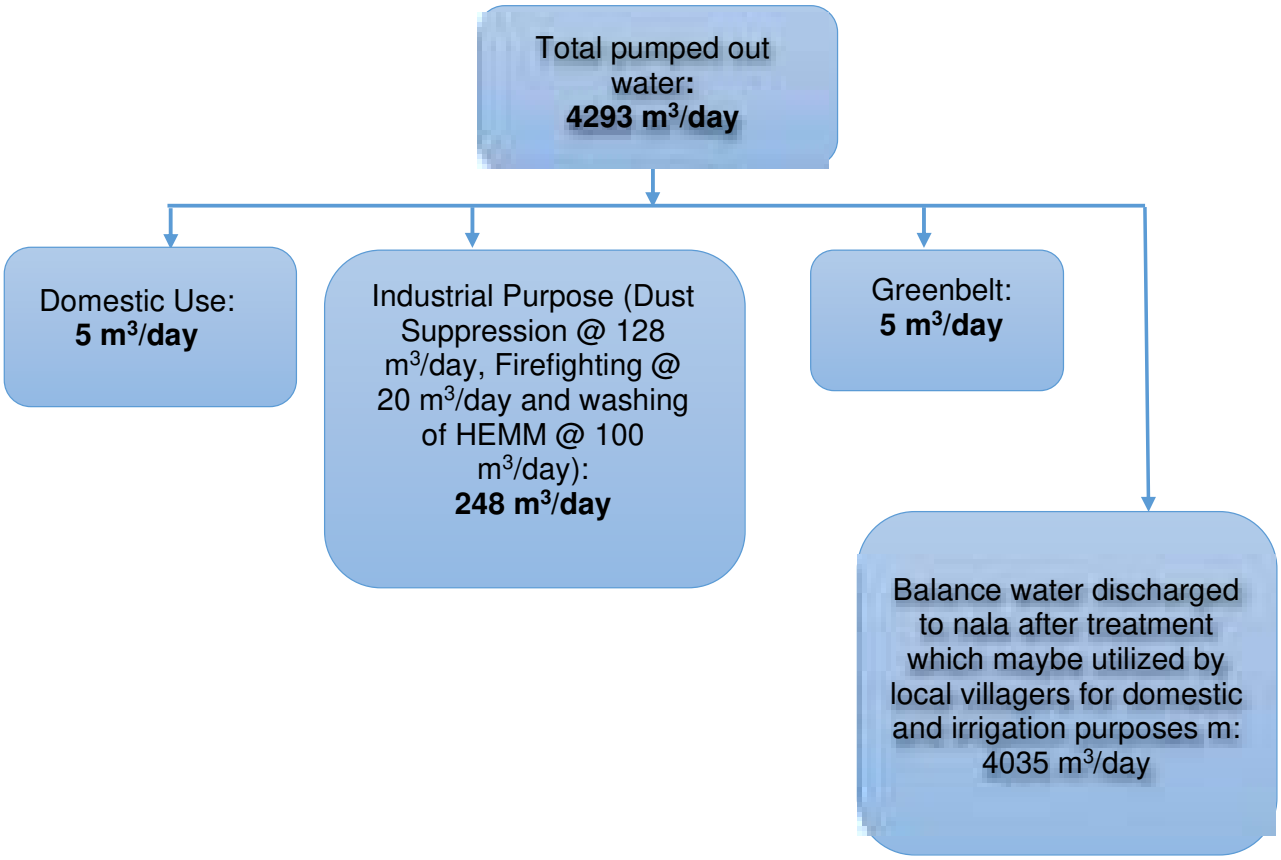
The groundwater inflow computation has been done by utilizing the above mentioned aquifer and mine parameters. Based on the Darcy's law (i.e. Q= KIA), the groundwater inflow for New Majri UG to OC Mine has been predicted at final mine depth of 250 m as given below:

Table Mine inflow Prediction of New Majri UG to OC

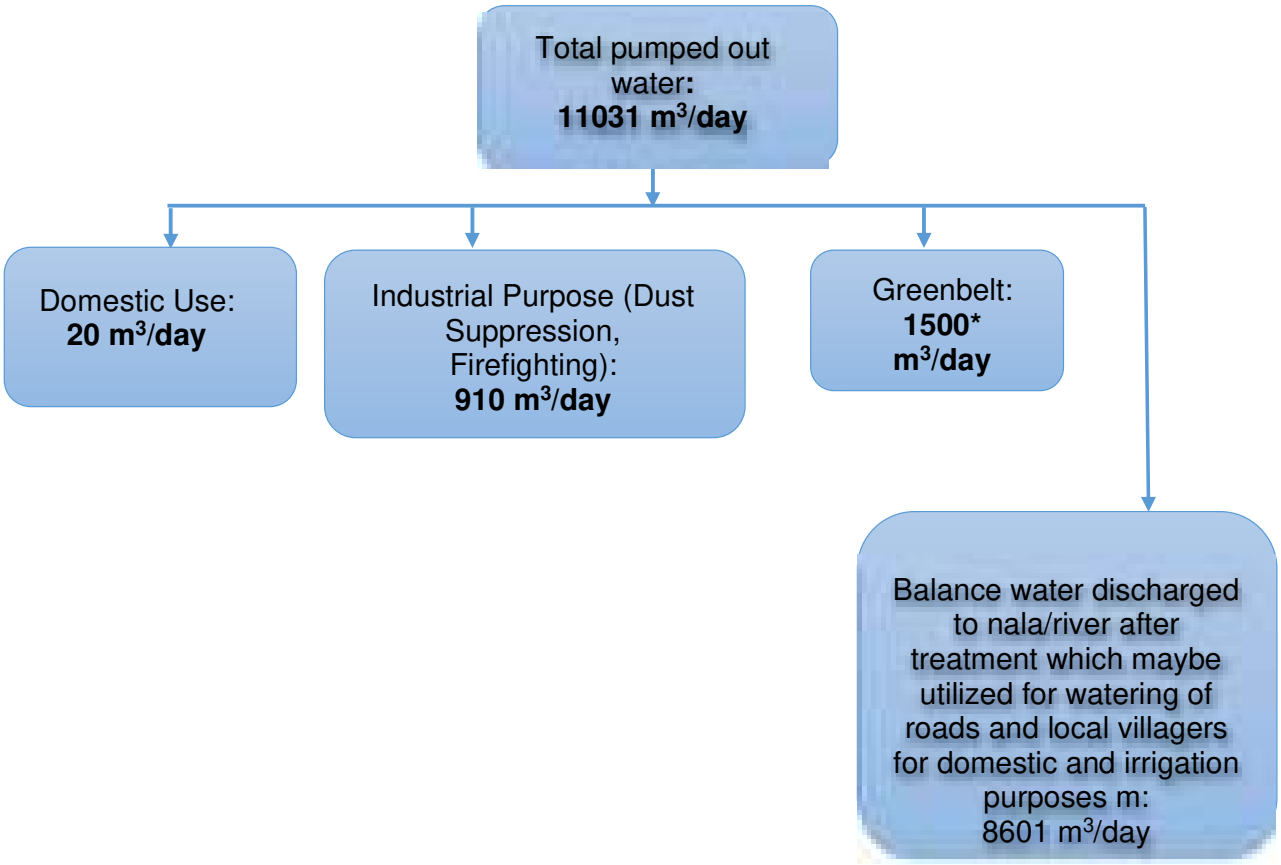
Sl No.	**Aquifer**	**Maximum Working Depth (m)**	**Mine face length (L) in m.**	**Avg. saturated OB thickness (m)**	**Seepage Area(m^2) (Open area) (A)**	**Hydraulic conductivity m/d (K)**	**Hydraulic gradient (I)**	**Mine inflow prediction (m^3/day) (Q)**
1	Unconfined	250	2163	20	43260	5	$3x10^{-2}$	6489
2	Semi-confined/ confined		2163	35	75705	2	$3x10^{-2}$	4542
	Total							11031

Note: The present value of actual mine seepage is 4293 m^3/day and flowchart showing its utilization is given as follows:

Flowchart for present utilization of pumped out mine water



Flowchart for utilization of pumped out mine water at peak



Strata seepage water is first gets accumulated in the mine sump which will act as first stage / primary settling tank/ Sedimentation pond. The settled water is then be pumped out and fed into a surface sedimentation tank for secondary treatment. The treated water from the surface sedimentation tank is being utilized for internal usage like domestic use, dust suppression measures, washing of HEMM & fire-fighting purpose. The surplus water after internal usage is released onto natural water sources as shown above.

For dewatering of mine water, NOC from CGWA for Expn. of New Majri UG to OC has been obtained vide no. CGWA/NOC/MIN/ORIG/2020/7125 dated 09-01-2020 with validity upto 08-01-2022 for maximum dewatering quantity of 4293 m3/day. Copy of the NOC letter is also placed below:

[illegible]

[illegible]

NOC EXTENSION CERTIFICATE FOR GROUND WATER EXTRACTION

Project Name	[illegible]		
Project Address	[illegible]		
Village	[illegible]	Block	[illegible]
District	[illegible]	State	[illegible]
Pin Code	[illegible]		
Office Address Address	[illegible]		
Address of CGWB Regional Office	Central Ground Water Board Central Region, [illegible]		

1	NOC No.	[illegible]			
2	Application No.	[illegible]	8	Category	[illegible]
4	Project Cost	[illegible]	5	NOC Type	[illegible]
6	Valid Upto	[illegible]	7	Valid up to	[illegible]

9 Ground Water Abstraction Operation

Public Water		Self-Use Water		Dewatering		Total	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
				[illegible]	[illegible]	[illegible]	[illegible]

10 Details of ground water abstraction (Dewatering Structure)

	Total Existing Block					Total Proposed No. of				
	DTs	DCB	BW	TW	RP	DW	DCB	BW	TW	RP
Abstraction Structure*	0	0	0	0	0	0	0	0	0	0

*DW: Dug Well; DCB: Dug cum Bore Well; BW: Bore Well; TW: Tube Well; RP: Recharge Pit

11	Location of ground water monitoring network (if any)	[illegible]		
11	Number of Piezometers or observation wells as per CGWB/SGWD/Municipality or as advised	No. of Piezometers	Recording Mechanism	
			Manual	SWLR* / DWLR*
	*SWLR - Digital Water Level Recorder	2	0	1

(Compliance Conditions given overleaf)

Chapter 4

CONSTRUCTION OF EMBANKMENT AT EXPANSION OF NEW MAJRI UG TO OC – CASE STUDY

4.1 Embankment Construction

The design criteria has been based on the Indian Standard Guidelines for planning and Design of river embankments from Compendium of Guidelines in the field of flood management by Ganga Flood Control Commission (G.F.C.C), Ministry of Water Resources, Govt. of India and Maharashtra Water & Irrigation Commission Report, 1999.

4.1.1 Spacing of Embankment

The spacing of embankments and their alignment needs careful consideration with respect to the vulnerability to the river and the rise of high flood levels on account of reduction in flow and also increase in peak discharge due to reduction in flood plain storage by construction of the factors embankment. Finalization of the alignment and the spacing with due consideration to the above factors and at the same time optimizing the benefits from the proposed embankment would need considerable experience of the river behavior and studies of the effects of the embankment along different alignments. In view of the widely varying nature of the rivers, no general recommendation about spacing of embankment can substitute the need for the above studies. The following general guidelines about the minimum spacing etc. are however, given mainly with an idea to check the tendency of excessive encroachment of the natural flood plain of the river.

In case of the embankment on both sides of the river, the spacing between the embankments should not be less than 3 times Lacey wetted perimeter for design flood discharge.

In case of the embankment on only one bank, the embankment should not be less than a distance equal to 1.5 times Lacey's wetted perimeter from the midstream of the river.

4.2 Calculation

Based on unlined channel / stream design on alluvial soil by Lacey's theory,

Lacey's wetted perimeter = $P_w = 4.75 \sqrt{Q}$

Where,

P_w = Lacey's wetted perimeter in meter;

Q = Discharge in cumecs (cubic meter per second)

1. Case Study of Expansion of New Majri UG to OC

Expansion of New Majri UG to OC mine is situated in located in Village Shivji Nagar Majri, District Chandrapur (Maharashtra). Wardha River flows along the southern boundary of the Project.

The Wardha River is a major river in Vidarbha region of Maharashtra in India. The Wardha River joins the Wainganga River at Chaprala in Gadchiroli district and forms the Pranahita River which ultimately flows into Godavari.

Fig Wardha river

To find Lacey's wetted perimeter of Wardha river at Expn. of New Majri UG to OC mine situated in Village Shivji Nagar Majri, Bhadravati tehsil, District Chandrapur (Maharashtra) based on following equation:

$P_w = 4.75 \sqrt{Q}$

Where,

P_w = Lacey's wetted perimeter in meter;

Q = Discharge in cumecs (cubic meter per second)

Q = 5633 * 10^6 Cu.m per year = 178.62 cu.m per sec = Average annual yield (Discharge) of water (based on Maharashtra Water & Irrigation Commission Report 1999)

$P_w = 4.75 \sqrt{178.62}$

= 4.75 * 13.36

= 63.46 m

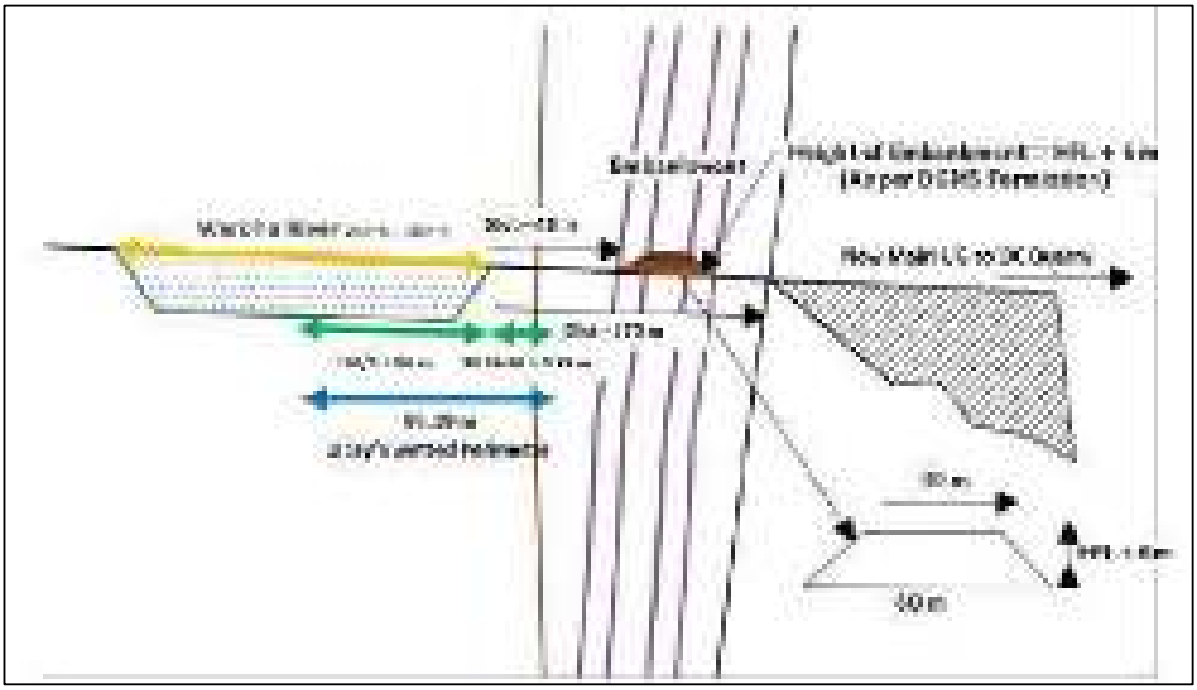
As embankment is on only one bank, the embankment should not be less than a distance equal to 1.5 times Lacey's wetted perimeter from the midstream of the river i.e. 1.5 * 63.46m = 95.19 m

As per Lacey's theory, Design criteria for flood protection Embankment, for only one bank should not be less than 95.19 m from midstream of river.

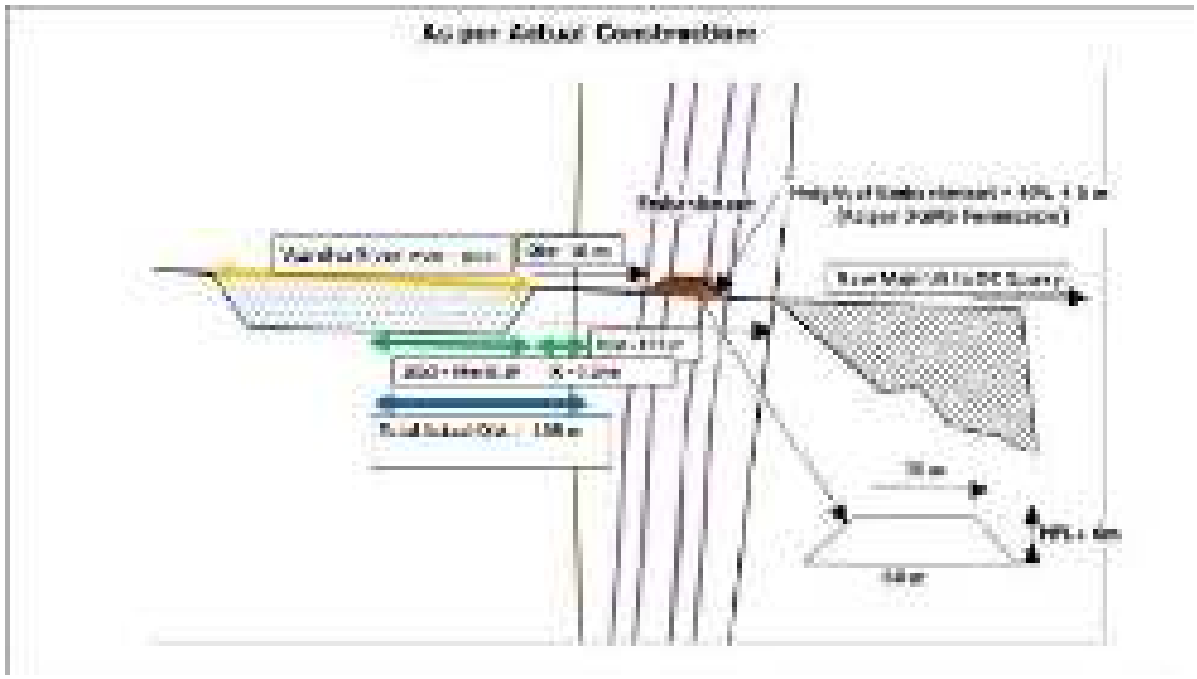
As the physical width of river at considered cross- section is 180 m.


Plan Showing Distance from Wardha River of Mine Features

As per theoretical Design Criteria:



As per Actual construction:



Conclusion:

As per Lacey's theory, Design criteria for flood protection Embankment, for only one bank should not be less than 95.19 m from midstream of river.

As per the actual construction, the embankment at Expansion of New Majri UG to OC is at a distance of 135 m away from the midstream of Wardha river on the one bank side.

As such, there is a free space of 40 m available for between the physical bank / edge of river and toe of the embankment which will allow water to spread without any constraint thereby minimizing adverse impact in the surrounding significantly.

In other way, the construction of embankment at Expansion of New Majri UG to OC site for protection of mine from the danger of surface inrush of Water as per the requirement of Coal Mines Regulation, 2017 and relevant permission from DGMS does not pose any danger to the river and the surrounding habitation.

Chapter 5

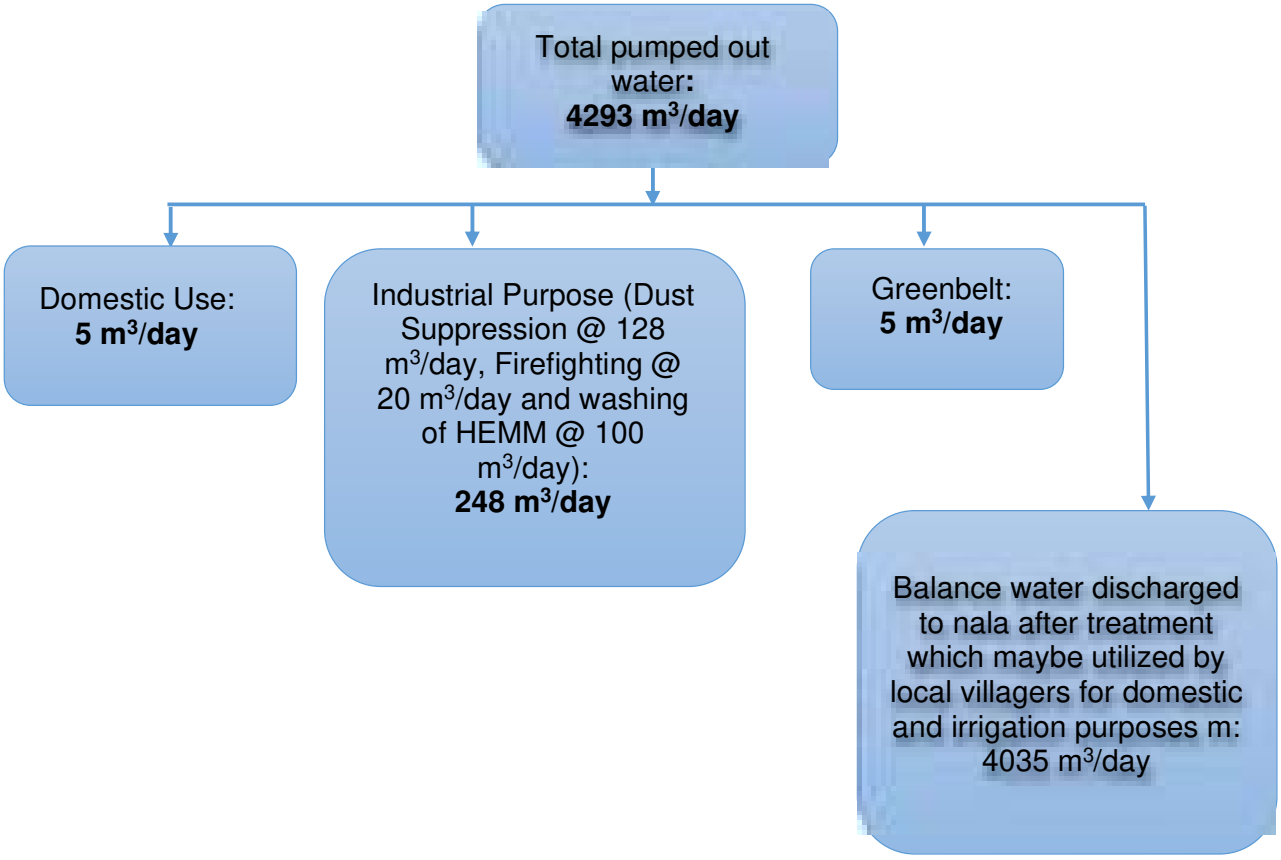
DISCUSSION

5.0 Mine Discharge

As deliberated in the above paragraphs, strata seepage water first is gets accumulated in the mine sump which will act as first stage / primary settling tank/ Sedimentation pond. The settled water is then be pumped out and fed into a surface sedimentation tank for secondary treatment. The treated water from the surface sedimentation tank is being utilized for internal usage like domestic use, dust suppression measures, washing of HEMM & fire-fighting purpose. The surplus water after internal usage is released onto natural water sources.

The quantity of mine discharge water (after treatment) is very less 4035 m3/day as compared to total amount of discharge in the Wardha river.

Flowchart for present utilization of pumped out mine water



The quality of mine discharge water (after treatment) also confirming the prescribed standards.

NOC from CGWA for Expn. of New Majri UG to OC has been obtained vide no. CGWA/NOC/MIN/ORIG/2020/7125 dated 09-01-2020 with validity upto 08-01-2022 for maximum dewatering quantity of 4293 m3/day. Copy of the NOC letter is also placed in the previous sections.

Suggestion/ Recommendations :

- Mine water may be discharged in the Wardha river only after proper treatment.
- The water being discharged into the Wardha river should confirm the prescribed water quality standard.
- Any increase or decrease in the quantity of mine water discharge resulting from dewatering may be reported to Central Ground Water Authority and necessary permission from CGWA may be obtained.

5.1 Embankment

As per Lacey's theory, Design criteria for flood protection Embankment, for only one bank should not be less than 1.5 times of lacey's vetted perimeter from midstream of river.

As per the proposal for construction, the embankment at New Majri UG to OC is at a distance of 135 to 150 m from the midstream of Wardha river on the one bank side.

As such, there will be free space of 40 m to 50 m available for between the physical bank / edge of river and toe of the embankment which will allow water to spread without any constraint thereby minimizing adverse impact in the surrounding significantly.

In other way, the construction of embankment at Expansion of New Majri UG to OC site for protection of mine from the danger of surface inrush of Water as per the requirement of Coal Mines Regulation, 2017 and relevant permission from DGMS does not pose any danger to the river and the surrounding habitation.

Suggestion/ Recommendations :

- Actual construction of the embankment should be carried out as per the design prescribed.

- Necessary permission may be obtained from DGMS to protect the mine from danger of surface inrush of water.
- Plantation / grass seeding may be carried out in vacant space between embankment and river bank.

5.2 Plantation / Green Belt Development

In the EIA-EMP, it is proposed that, 234.80 ha of 706.28 ha will be afforested including plantation on embankment. The stage wise reclamation and afforestation is placed in the below table:

S. No.	Land use category	Present (1st year)	5th year	10th year	14th Year End of Mine Life	Post Mining
1	Backfilled Area	0.00	0.00	0.00	0.00	0.00
	Reclaimed with plantation)	0.00	0.00	0.00	0.00	0.00
2	Excavated Area (Not reclaimed) /void	51.72	155.66	325.91	358.35	358.35
3	Ext. OB dump	38.40	84.60	84.60	84.60	84.60
	(Reclaimed with plantation)	0	0	60	84.60	84.60
4	Reclaimed Top soil dump	0	4.2	4.2	4.2	4.2
		0	4.2	4.2	4.2	4.2
5	Green Built Area (included in 3, 6,7 & 8)	---	--	--	--	--
6	Undisturbed area (brought under plantation)	571.16	393.62	223.37	190.93	190.93
		20	40	60	80	140
7	Colony & Infrastructure	15	15	15	15	15
		0.00	2	2	2	2
8	Embankment*	30	53.20	53.20	53.20	53.20
		0.0	4.0	4.0	4.0	4.0
Total		**706.28**	**706.28**	**706.28**	**706.28**	**706.28**
Plantation		**20.00**	**50.20**	**130.20**	**174.80**	**234.80**

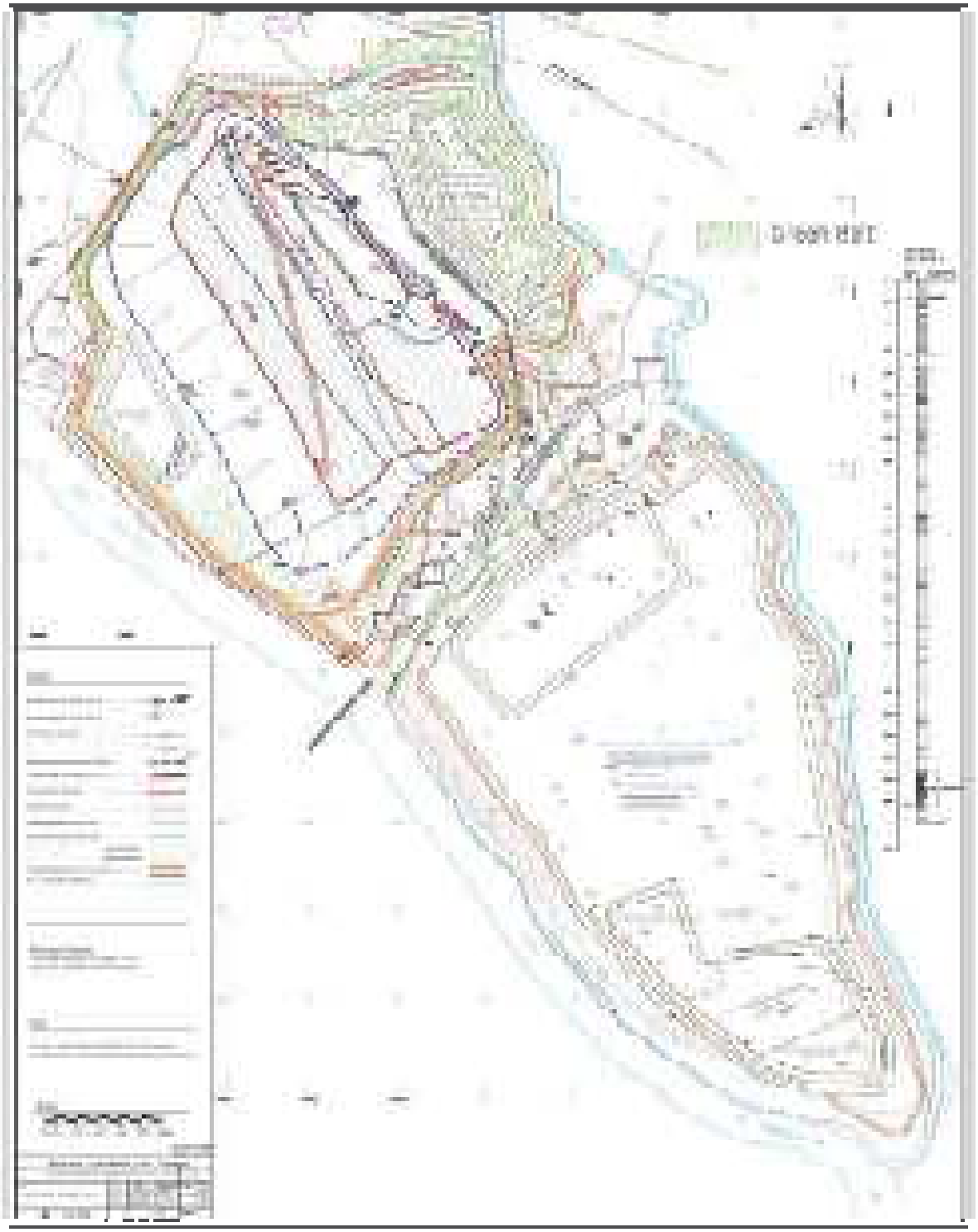
*Peripheral Plantation over the Embankment is proposed. Grassing will be done over the slops of Embankment.

Suggestion / Recommendations:

- Plantation / grass seeding may be carried out in vacant space between embankment and river bank.
- Green belt may be developed all along the periphery of the mine boundary as proposed.

5th Year Stage Plan

10th Year Stage Plan



Plan Showing Existing and Proposed Green Belt

Chapter 6

CONCLUSION

The strata seepage water is being abstracted from the mine sump for safe operation of the mine. This pumped out mine water meets the entire internal usage (Dust suppression purpose, washing of HEMM, firefighting needs, etc.). The balance quantity is let off the natural water courses after treatment. The CGWA NOC has also been secured accordingly for maximum dewatering quantity of 4293 m3/day .

The mine discharge from New Majri UG to OC into Wardha river is very less as compared to total discharge in the Wardha river. As such, this quantity of water will contribute as small aid to Wardha river volume and is not likely the affect the quality of water in Wardha river adversely. As such, there is no danger to the aquatic flora and fauna in the riverine eco system.

Construction of embankment at Expn. New Majri UG to OC site for protection of mine from the danger of surface inrush of Water as per the requirement of Coal Mines Regulation, 2017 and relevant permission from DGMS does not pose any danger to the river and the surrounding habitation.

Plantation / grass seeding in vacant space between embankment and river bank will reduce the soil erosion in the stretch.

The study reveals that, the riverine ecosystem in the study area (core zone & 10 km buffer zone) is having enough carrying capacity, both in terms of supportive and assimilative capacity, to support the development of the ecosystem of the area.

****

Annexure 29

TECHNICAL NOTE NO. [illegible]

GOVERNMENT OF MAHARASHTRA

WATER RESOURCES DEPARTMENT

DESIGN FOR
DIVERSION OF KORADI NALLA
UNDER WESTERN COALFIELDS LIMITED
MAJRI AREA

TAL.: DHARGAWATI DIST. CHANDRAPUR

MARCH - 2016

SUPERINTENDING ENGINEER (DAM)
DESIGN CIRCLE,
CENTRAL DESIGNS ORGANISATION
DINDORI ROAD, NASHIK - 422004

A REPORT ON

DESIGN FOR DIVERSION OF KORATI NALLA IN SHAORAWATI TEHSIL DIST. CHANDRAPUR, WESTERN COALFIELDS LIMITED, MAJRI AREA

(CONSULTANCY WORK)

INDEX

Part – A : REPORT

Part – B : DETAILED ESTIMATE

PART – C : APPENDICES :

ANNEXURES :

DESIGN FOR RIVETMENT OF KOTARI NALLA IN CHANDRAPUR TEHSIL DIST. CHANDRAPUR, MAHARASHTRA COMMUNICATION AREA

A CONSULTANCY WORK

1.0 INTRODUCTION

[illegible]

[illegible]

[illegible]

[illegible]

2.0 SCOPE OF PRESENT WORK

The design [illegible] scope

1. [illegible]
2. [illegible]
3. [illegible]

3.0 CALCULATION OF FLOOD

The catchment area of Koradi Nala is [illegible] sq. km. The 1 in 100 year flood for Koradi Nala was worked out as 540.53 [illegible] Technology Projects, Nashik. On the basis of site conditions and cross sectional data supplied vide letter no. [illegible] dated 17/02/2015, observed flood of [illegible] cumecs over 120 cumecs. In view of wide variation in [illegible] of 1 in 100 year flood and observed flood, CDO vide letter no. [illegible]/2016 dated [illegible]/2016 requested [illegible] to give concurrence to flood value pertaining to field conditions. [illegible] officials vide [illegible] requested that the design of channel [illegible] based on the flood value of 540.53 cumecs (1 in 100 year) is uneconomical and unnecessary and suggested to take half the value of 1 in 100 year flood 540.53 cumecs i.e. 270.265 cumecs. Accordingly the issue is discussed in CDO and it is decided to design the channel section with [illegible] Govt. Circular No. [illegible] dated 27.06.2017, Para 4.5.1 and the 50% of 1 in 100 years flood [illegible] flood for [illegible] calculated and attached as Annexure I. [illegible] observed flood [illegible] provided [illegible] are given below:

Sr. No.	Description	Flood	Remarks
1	Koradi Nala	270.265	50% of 1 in 100 Year Flood
2	Koradi Nala	5[illegible]	[illegible] Flood
3	[illegible] Nala	[illegible]	Observed Flood
4	[illegible] Nala	[illegible]	[illegible] Flood

4.0 DESIGN CONSIDERATIONS

For design of channel, the governing parameters are quantum of flow, velocity of flow through the channel, [illegible] coefficient, full supply depth and bed gradient of [illegible] considered as under.

4.1 Design flood [illegible] adopted

[illegible] Bank Of Maharashtra circular dated 27/01/1987. The [illegible] are provided in tabular form.

1. High Flood - 555.745 Cumecs (Kandi Nala)
2. [illegible] 50 Nos. in 100 year flood - 370.045 Cumecs (Kandi Nala)
3. High Flood – 542.598 Cumecs (Shirna Nala)
4. [illegible] - 237.54 Cumecs (Shirna Nala)

4.3 Freeboard

The [illegible] for the design flood are worked out by Manning's formula [illegible] IS 4997-1968. In high velocity and rapid velocity reaches to design [illegible] flow velocity recording. To avoid [illegible] freeboard [illegible] is a high in accordance with following guidelines:

- The minimum freeboard is not [illegible] 1.0 m [illegible] Bureau of Mines 1939 [illegible] 0.60 m/sec. to [illegible] m/sec.
- The [illegible] freeboard [illegible] IS 4997-1968. Nagpur has recommended [illegible] 0.60 m/sec. to [illegible] 0.90 m/sec.

In the design of diversion the [illegible] 0.91 m [illegible] 0.61 m/sec.

4.4 Coefficient of Roughness

The coefficient of roughness mainly depends upon the nature of the [illegible] flowing channel. In the case of diversion of Kandi nala [illegible] mountain rocks with [illegible] in parts. The coefficient of roughness as per provisions [illegible] IS 2027 (Pt. No. 2)/(35)(MF dated 01/03/2017) is taken as 0.05 as the [illegible] is provided for [illegible] weir.

4.5 Retaining walls and the ripple depth:

For the [illegible] hydraulic [illegible] function, [illegible] depth values are recommended vide circular no. WR-2015/(CR No. [illegible]) [illegible] 01/03/2015 but they are for small and [illegible] canals. It is not possible to follow [illegible] in the design of diversion weirs and hence [illegible] such a way that the [illegible] is not [illegible].

5.1 Bed Gradient:

For diversion channel, the main constraint for design of section is bed gradient. Here there is no alternative but to divert the channel and [illegible] [illegible] [illegible] the position of existing bed gradient and proposed bed gradient is tabulated below.

Sl No	Reach	Existing Level Difference	Reach Length	Natural Bed Gradient	Proposed Bed Gradient
1	Existing [illegible] [illegible]	[illegible]	[illegible]	1 in [illegible]	
2	Proposed [illegible] [illegible]	[illegible]	7000 m	1 in [illegible]	1 in 1000
3	Existing [illegible] [illegible] [illegible]	2.820	1020	1 in 360	

5.2 DESIGN OF CHANNEL SECTION

The channel section is designed in such a way to pass the design flood with economical cross sectional area. Various trials for the design are attached in Annexure. Finally adopted channel sections are tabulated in following table.

Sl. No	Location From Ch. to Ch.	Design Discharge (cumec)	Bed Width (m)	Full Supply Depth (m)	Side Slope (H:V)	Velocity (m/sec)	Design Freeboard (m)	Remarks
1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2	[illegible] 3000	[illegible]	[illegible]	[illegible]	1.50	[illegible]	[illegible]	[illegible]

5.3 Side Slopes

The channel section is passing through cutting and filling so the side slopes needs to be provided considering the occurrence of various types of strata

[illegible]

5.2 Transition

[illegible]

5.0 FREEBOARD

[illegible]

3.0 CURVES

[illegible]

L.3 PROTECTION AGAINST ALONG DIVERSION CHANNEL

[illegible]

[illegible] shall be used for construction [illegible] of embankment on both sides [illegible] proposed as 5.00 m. The [illegible] of the [illegible] proposed as 2.00 m.

[illegible] of [illegible] the existing [illegible] will 2.50 m [illegible] proposed. The [illegible] approach is proposed as 0.25 m or 1.50 m [illegible] to [illegible] the road level [illegible]

[illegible] REGRADATION OF ROAD

[illegible] Regradation Of Existing Drain Roads up to Start Of Proposed Diversion

[illegible] proposed alignment [illegible] the regradation [illegible] the TR, [illegible] proposed as the start point of proposed diversion up to [illegible] Above TR [illegible] road level [illegible] the road.

[illegible] Stone Pitch Approach In Its Confluence With Proposed Diversion

[illegible] Stone pitch [illegible] Stone pitch [illegible] Stone pitch and protection [illegible]

The existing pitch [illegible] to [illegible] the [illegible] proposed [illegible] the [illegible] proposed [illegible] the [illegible] proposed [illegible] the [illegible] as under:

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

1.0 INLET OF DIVERSION

[illegible]

1.1 OUTLET OF DIVERSION

[illegible]

1.2 PLUGGING THE [illegible] OF KOSI HALLA AND [illegible]

[illegible]

1.3 [illegible]

PART-B- DESIGN OF PLUG

1.0 [illegible]

Plug No.1

[illegible]

Plug No.2

[illegible]

2.0 UNDER SEEPAGE [illegible]

[illegible]

[illegible] coal from the nearby [illegible]. Seepage through [illegible] [illegible] mining operation [illegible]. In [illegible] not available [illegible] depths. Hence a [illegible] of the order of [illegible] hydraulic head below [illegible] is proposed. [illegible] taken to avoid [illegible]. The center of CGT should be [illegible] at the point [illegible] slope of 0.2 [illegible] ground level. The bottom width of the [illegible] and the side slopes of excavation shall be [illegible] standard practice [illegible] IS 8826-1978

- Overburden : 1.5 H : 1.00 V
- Soft Rock : 0.5 H : 1.00 V
- Hard Rock : 0.25 H : 1.00 V

After excavation, the [illegible] should be properly [illegible] and any loose patches, if any, should be removed before starting CGT filling. The permeability of the strata below excavated [illegible] should be checked properly and ensured that the strata is impervious and [illegible].

5.0 EMBANKMENT FOR NALLA PLUG

[illegible] are proposed for the construction of nalla plug.

6.0 SOIL INVESTIGATIONS

6.1 [illegible] samples [illegible] along the proposed diversion [illegible]. [illegible] not more than 15 [illegible]

6.2 Testing

Total 3 nos. of soil samples [illegible] and results are made available. The test results [illegible] and following design parameters are [illegible] for design.

[illegible]	C [illegible]	MDD (T/m³)	Sp. Gr.	Permeability (cm/sec)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

6.3 Coring

Total [illegible] nos. of core samples [illegible]. The test results are [illegible] and following design parameters are [illegible] for design.

[illegible]	[illegible]	OCD	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0.660	0.58	3.879	2.888	3.881

3.0 FOUNDATION

The soil parameters of bearing are proper [illegible] foundation and [illegible] as follows.

Item	C	[illegible]	[illegible]	[illegible]
0.56	0.78	1.835	[illegible]	3.880

4.0 DESIGN DETAILS

Sufficient quantities of [illegible] are [illegible] available. [illegible] proposed to provide a good [illegible] of [illegible] of [illegible] level [illegible] and [illegible].

4.1 Data: Sure

The [illegible] same [illegible] considered [illegible] from the [illegible] of [illegible] and [illegible] the [illegible] of diverse [illegible]. The [illegible] of the [illegible] of [illegible] provided with top width [illegible] m. Free board of [illegible] m is provided as [illegible] practice. The [illegible] is provided with slope of [illegible] [illegible] slope [illegible] m. The [illegible] are provided [illegible] for [illegible].

4.2 Impervious Core

[illegible] have [illegible] during [illegible] [illegible] quantity of [illegible] is available [illegible] compaction [illegible] of [illegible] [illegible] material. [illegible] provide [illegible] with top width of [illegible] m. The top of [illegible] slope [illegible] m above full supply depth.

4.3 Safety Parameters

The design [illegible] provided [illegible] for present design of [illegible] Dikhand [illegible] are [illegible] as follows.

Parameters	[illegible]	C (T/m²)	[illegible] (T/m²)	[illegible]	[illegible]
[illegible]	0.680	[illegible]	3.879	3.888	3.880
[illegible]	0.755	0.980	[illegible]	[illegible]	0.812
[illegible]	0.241	0.55	[illegible]	2.868	[illegible]

4.4 Earthquake Coefficients

[illegible] is based in [illegible] seismic [illegible]

[illegible]

7.0 OTHER [illegible]

[illegible] detail provides guidelines for [illegible] of [illegible] is needed to [illegible]

7.1 Upstream

1. [illegible]
2. [illegible]

7.2 Down Stream Slopes:

1. Steady seepage without earthquake
2. Steady seepage with earthquake

7.3 Method Of Stability Analysis

The stability analysis of both upstream and downstream slopes of designed [illegible] has been carried out by the Swedish slip circle method by a special computer program developed by C.G.O. Hoeft.

7.4 Factor Of Safety

The minimum factors of safety for different conditions have been [illegible] as per IS-7894-1975. Factor of safety arrived for different stability conditions are summarised as below

Factor Of Safety Condition	Upstream Slope		Downstream Slope	
	Reservoir Full with EQ	Sudden Drawdown without EQ	Steady Seepage with EQ	Steady Seepage without EQ
Minimum Permissible	1.00	1.375	1.000	1.500
Factor Of Safety Arrived	1.415	1.001	1.599	1.592

[illegible] proposed with no [illegible] required. It is seen that factors of safety arrived are more than the recommended IS-7894-1975. Hence, the proposed earth bund section is considered to be safe against the [illegible] and the foundation bund [illegible]

8.0 OTHER PROVISIONS:

8.1 Stripping The Bund Seat:

[illegible] 0.57 m depth in the above [illegible] vegetation [illegible] and any other [illegible] provided.

4.2 Internal Drainage Arrangement

[illegible] drainage [illegible] and other [illegible] drainage [illegible] provided.

4.3 Rock Toe

It is [illegible] that the height of rock toe shall be [illegible] or that is [illegible].

1) [illegible] above the peak [illegible] 25 % of [illegible]

2) 0.5 [illegible] above horizontal [illegible].

3) The height of rock toe [illegible] above shall be subject to [illegible] and [illegible] 1.00 m and 1.0 m respectively.

[illegible] rock toe [illegible] provided. The height of the rock toe may be [illegible] if rock quarry of rock is available from the company [illegible] to make the rock [illegible] on the [illegible] of rock toe [illegible] sand layer, 250 mm thick gravel layer, 250 mm thick [illegible] 750 mm [illegible] shown in drawing should be provided.

4.4 Upstream Slope Protection

The [illegible] of the bund is proposed to be protected [illegible] hand packed [illegible] 300 mm thick and [illegible] 250 mm thick [illegible]. The [illegible] of packing [illegible] IS 8826 [illegible].

5.5 Downstream Slope Protection

The downstream slope [illegible] by [illegible] grass [illegible] to prevent [illegible] and gully formation.

5.0 POINTS OF ATTENTION:

1) [illegible] design/drawings approved under this [illegible] obtained in field level [illegible] from competent authority [illegible] standards. [illegible] design.

2) This design and drawings prepared based on the data supplied by [illegible] authority. Responsibility [illegible]

rests with the field authority. CDO will not be responsible for any mistakes in design due to inaccurate data.

4) The drawing should not be used for execution till approval from Competent WRD authority is obtained.

4) While preconstruction inspection of the existing structure, if cracks and the failure of any type like [illegible] damages, etc. [illegible] may be repaired before execution [illegible] so that [illegible] will function with its full potential and will not create any problem in the future.

5) Soil and stacks of ready materials like gravel, bags of sand, murum, metal etc. may be kept in the vicinity of weir for [illegible] leakages for immediate repairs, if any required during [illegible].

6) The parameters of the [illegible] and [illegible] collection shall be checked before start of execution to avoid any problems in the future.

7) In accordance with [illegible] letter [illegible]/2016 and discussion with concern WRD authorities, [illegible] values for [illegible] flood values at 50% of [illegible] in 100 years [illegible] 127.168 Cumecs & high flood 525.075 Cumecs are adopted. Cross section as per [illegible] in field condition and previous record of flood occurrence shall be accepted with prior approval from competent WRD authority.

8) All necessary No Objection Certificate required from revenue, forest, environment and Water Resources authorities shall be obtained by WRD before commencement of work.

Certified:-

1) The design and drawings are CDO pattern and [illegible] checked by [illegible] attached.

2) All original design calculations and related correspondence [illegible] CDO [illegible] file number [illegible].

11.0 FEED BACK

1. During [illegible] control tests and [illegible] results [illegible] shall be made available to [illegible].

2. After completion of the structure work, [illegible] should be [illegible]

[illegible]

4. During [illegible] flood [illegible] channelising [illegible] the [illegible] may be [illegible] to Central Design Organisation.

[illegible]
(G. D. [illegible])
Sub Divisional Engineer
Design Division R.D.S.
[illegible] C.D.O.
[illegible]

[illegible]
(P. K. [illegible])
Executive Engineer
Design Division [illegible]
[illegible]
[illegible]

Recommended for approval

[illegible]

(M. S. [illegible])
Superintending Engineer (D.)
Design Circle
Central Design Organisation
[illegible]

ANNEXURE No. [illegible]

[illegible]

- [illegible]

- [illegible]

  [illegible] Drainage Area = [illegible] sq Km

  = [illegible] Km

  [illegible] Flood = [illegible] sq Km

  = [illegible] [illegible]

  = [illegible]

  = [illegible] Cumec

  = [illegible] Cumec

- [illegible] Flood Calculated By [illegible] = [illegible] Cumecs
- [illegible] Flood Calculated By WAPDA = [illegible] Cumecs
- [illegible] Flood Calculated By [illegible] = [illegible] Cumecs.

ANNEXURE No. 1

[illegible]

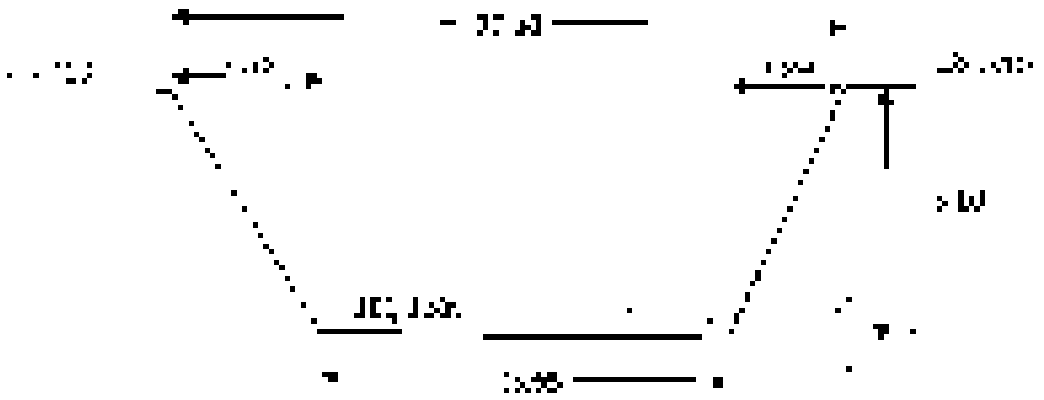
[illegible] Dated [illegible]

- Calculation of Weight [illegible]

Calculation [illegible]	[illegible] sq Km.
	[illegible] sq Mtrs
Weight Bond	[illegible] [illegible]
	[illegible]
	[illegible] Quintal
	[illegible] Quintal

[illegible]

[illegible] Calculation Of Observed Flood Of Sharda Nahar



[illegible]

[illegible]

[illegible]

$A = [illegible]$

$A = [illegible]$ sq. ft

$P = [illegible]$

$R = [illegible]$

$V = [illegible]$

$Q = [illegible]$

$Q = [illegible]$

$Q = [illegible]$ cusecs

[illegible]

[illegible]

[illegible]

[illegible] = 270.265 Cumecs

[illegible] = 545.086 Cumecs

B (m)	y (m)	n	Channel Side Slope	S Longitudinal Slope	A (m2)	P (m)	R (m)	R^2/3	S^1/2	V in m/Sec	Discharge Q (Cumecs)	Design Discharge	Remark
For 50% Flood Of 1 in 100 year Flood = 270.265 Cumecs													
30.00	3.00	0.025	1.50 : 1.00	1 in 1000	103.500	40.765	2.712	1.945	0.032	2.460	270.727	270.265	Safe
26.00	3.25	0.025	1.50 : 1.00	1 in 1000	100.844	37.140	2.878	[illegible]	0.032	[illegible]	[illegible]	270.265	Safe
24.00	3.50	0.025	1.50 : 1.00	1 in 1000	[illegible]	40.814	[illegible]	[illegible]	0.032	[illegible]	[illegible]	[illegible]	Safe
20.00	3.75	0.025	1.50 : 1.00	1 in 1000	95.844	31.520	3.155	2.156	0.032	2.733	261.990	270.265	Safe
19.00	4.00	0.025	1.50 : 1.00	1 in 1000	100.000	30.314	3.355	2.216	0.032	2.803	280.307	270.265	Safe
15.00	4.25	0.025	1.50 : 1.00	1 in 1000	90.844	30.321	3.744	2.356	0.032	2.857	271.494	270.265	Safe
14.00	4.50	0.025	1.50 : 1.00	1 in 1000	93.375	30.224	3.454	2.307	0.032	[illegible]	[illegible]	270.265	Safe
13.00	4.75	0.025	1.50 : 1.00	1 in 1000	95.593	30.455	3.135	2.356	0.032	2.463	284.376	270.255	Safe
For Design Flood = 526.076 Cumecs													
63.30	3.00	0.025	1.50 : 1.00	1 in 1000	203.500	74.415	2.498	2.006	0.032	2.515	535.751	526.076	Safe
54.00	[illegible]	0.025	1.50 : 1.00	1 in 1000	204.344	67.492	3.041	2.065	0.032	2.555	512.561	526.076	Safe
51.00	3.50	0.025	1.50 : 1.00	1 in 1000	196.875	60.899	3.233	2.166	0.032	2.765	544.461	526.076	Safe
45.00	3.75	0.025	1.50 : 1.00	1 in 1000	189.844	58.807	3.434	2.261	0.032	2.866	544.462	526.076	Safe
40.00	4.00	0.025	1.50 : 1.00	1 in 1000	184.000	53.414	3.590	2.242	0.032	2.963	545.456	526.076	Safe
36.00	4.25	0.025	1.50 : 1.00	1 in 1000	175.844	47.461	3.740	2.425	0.032	3.045	535.460	526.076	Safe
37.00	4.50	0.025	1.50 : 1.00	1 in 1000	174.375	44.798	3.994	2.477	0.032	[illegible]	545.361	526.076	Safe
30.00	4.75	0.025	1.50 : 1.00	1 in 1000	172.594	41.456	4.044	2.538	0.032	3.211	553.546	526.076	Safe

[illegible]

DESIGN OF SHIVAMANALA REGRADATION

Design Flood : Q [illegible] = [illegible]

Q Regime : [illegible]

SHIVAMANALA REGRADATION [illegible]

[illegible]	[illegible]	[illegible]	Original Sec Slope	S (Longitudinal Slope)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Remark
Combined Flood : [illegible]														
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Fortnightly Flood : [illegible]														
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Sl. No.	Date	Name	Designation	Signature
170	[illegible]	[illegible]	[illegible]	[illegible]
171	[illegible]	[illegible]	[illegible]	[illegible]
172	[illegible]	[illegible]	[illegible]	[illegible]
173	[illegible]	[illegible]	[illegible]	[illegible]
174	[illegible]	[illegible]	[illegible]	[illegible]
175	[illegible]	[illegible]	[illegible]	[illegible]
176	[illegible]	[illegible]	[illegible]	[illegible]
177	[illegible]	[illegible]	[illegible]	[illegible]
178	[illegible]	[illegible]	[illegible]	[illegible]
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182	[illegible]	[illegible]	[illegible]	[illegible]
183	[illegible]	[illegible]	[illegible]	[illegible]

187	08.07.22	[illegible]	[illegible]	[illegible]
188	08.07.22	[illegible]	[illegible]	[illegible]
189	[illegible]	[illegible]	[illegible]	[illegible]
190	08.07.22	[illegible]	[illegible]	[illegible]
191	19.8.22	[illegible]	[illegible]	[illegible]
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197	—"—	[illegible]	—"—	
198	—"—	[illegible]	—"—	
199	—"—	[illegible]	—"—	
200	05.09.2022	[illegible]	[illegible]	[illegible]
201	—"—	[illegible]	[illegible]	[illegible]
202	05.09.22	[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

क्र.	Date दिनांक	[illegible]	[illegible]	
246	12-07-2022	[illegible]	[illegible]	[illegible]
247	—"—	[illegible]	[illegible]	[illegible]
248	—"—	[illegible]	[illegible]	[illegible]
249	—"—	[illegible]	[illegible]	[illegible]
250	15-07-22	[illegible]	[illegible]	[illegible]
251	—"—	[illegible]	[illegible]	[illegible]
252	19-07-2022	[illegible]	[illegible]	[illegible]
253	—"—	[illegible]	[illegible]	[illegible]
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255	[illegible]-22	[illegible]	[illegible]	[illegible]
256	[illegible]-5-22	[illegible]	[illegible]	[illegible]
257	[illegible]-22	[illegible]	[illegible]	[illegible]
258	[illegible]-22	S. T. [illegible]	[illegible]	[illegible]
259	[illegible]-22	[illegible]	[illegible]	[illegible]
260	[illegible]-22	[illegible]	[illegible]	[illegible]
261	10-09-22	[illegible]	[illegible]	[illegible]
262	12-09-22	[illegible]	[illegible]	[illegible]
263	—	[illegible]	[illegible]	[illegible]
264	—"—	[illegible]	[illegible]	[illegible]
263	—"—	[illegible]	[illegible]	[illegible]
265	25-09-22	[illegible]	[illegible]	[illegible]
266	—"—	S. M. [illegible]	—"—	S. [illegible]
267	—"—	[illegible]	—"—	[illegible]
268	30-9-22	S. T. [illegible]	—"—	[illegible]
269	—"—	[illegible]	—"—	[illegible]

270	12-10-22	[illegible]	[illegible]	[illegible]
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272	—"—	[illegible]	[illegible]	[illegible]
273	6-10-22	[illegible]	—"—	[illegible]
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275	—"—	[illegible]	—"—	[illegible]
276	6-10-22	[illegible]	[illegible]	[illegible]
277	5-10-22	[illegible]	—"—	[illegible]
278	—"—	[illegible]	—"—	[illegible]
279	5-10-22	[illegible]	—"—	[illegible]
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281	11-10-22	[illegible]	—"—	[illegible]
282	12-10-22	[illegible]	—"—	
283	—"—	[illegible]	[illegible]	[illegible]
284	14-10-22	[illegible]	—"—	[illegible]
285	25-10-22	[illegible]	[illegible]	[illegible]
286	—"—	[illegible]	—"—	[illegible]
287	27-10-22	[illegible]	[illegible]	[illegible]
288	—"—	[illegible]	[illegible]	[illegible]
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290	—"—	[illegible]	[illegible]	[illegible]
291	—"—	[illegible]	[illegible]	[illegible]

292	28-11-2022	[illegible]	[illegible]	[illegible]
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306	15-11-2022	[illegible]	[illegible]	[illegible]
307	—"—	[illegible]	[illegible]	[illegible]
308	25-11-2022	[illegible]	—"—	[illegible]
309	—"—	[illegible]	[illegible]	[illegible]
310	27-11-2022	[illegible]	[illegible]	[illegible]
311	—"—	[illegible]	[illegible]	[illegible]
312	[illegible]	[illegible]	[illegible]	[illegible]

330	26-12-2022	[illegible]	[illegible]	[illegible]
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332	26-12-2022	[illegible]	[illegible]	[illegible]
333	—	[illegible]	[illegible]	[illegible]
334	26-12-2022	[illegible]	[illegible]	[illegible]
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338	—	[illegible]	[illegible]	[illegible]
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340	—	[illegible]	[illegible]	[illegible]
341	26-12-2022	[illegible]	—	[illegible]
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343	—	[illegible]	[illegible]	[illegible]
344	26-12-2022	[illegible]	[illegible]	[illegible]
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348	27-12-2022	[illegible]	[illegible]	[illegible]
349	27-12-2022	[illegible]	—	[illegible]
350	27-12-2022	[illegible]	—	[illegible]

LIST

S.No.	Name	Signature	Mobile-Number
1	Sahil Gupta		
2.	Ram mohan	Rammohan	
3.	Prafull Sagar		
4.	Sathish Kumar	Sathish Kumar	
5.	Cedan Begree		
6.	Mahbir Singh		
7.	Dayanand Singh		
8.	Sachin Badoriya		
9.	Vijay Kumar		
10.	Tanuj Kumar		
11.	[illegible]	[illegible]	
12.	Sahil		
13.	Pawan Kumar		
14.	Rajesh Singh		
15.	Mahesh Kumar		
16.	Raghav Khan		
17	[illegible]		
18	[illegible]		Shakti
19	[illegible]	[illegible]	
20	[illegible]	[illegible]	
	08/02/2023		
1)	D.K. Sundar		
2	[illegible]		
3	Vijay Kumar		
4	[illegible]		
5	[illegible]		
6	S. [illegible]		
7	S. [illegible]		

8/12/23

8	Vishal D. Ramade	E.M. Fitter	
9	G. B. Bade	— " —	
10	N. R. Fulle	Sub-master	
11	Dhan[illegible] Meshram	— " —	
12	V. D. [illegible]	— " —	
13	W. S. [illegible]	Sub-master	
14	[illegible]	[illegible]	
15	P. M. Pota	[illegible]	
16	Bhaskar Bansod	Fireman	
17	[illegible] Singh	Driver	
18	R. N. [illegible]	[illegible]	
19	[illegible]		
20	[illegible]		
21	Vikram Vaidya		
22	Prabhakar Bade	Fr. Helper	
23	D. G. Badki	Fr. Helper	
24	[illegible]	— " —	
25	[illegible]	— " —	
26	Nishant Gohane	— " —	
27	V. S. [illegible]	— " —	
28	C. L. Chitnavis	— " —	
29	R. N. Tayde	— " —	
30	[illegible]	— " —	
31	D. S. Bante	— " —	
32	Vijay Tekade	— " —	
33	P. [illegible]	— " —	
34	[illegible]	— " —	
35	[illegible]	— " —	
36	D. G. Mude	— " —	
37	[illegible]	— " —	

23/12/23

38	[illegible]	— " —	[illegible]
39	K. C. Chinnakuttappan	— " —	[illegible]
40	[illegible]	[illegible]	[illegible]
41	[illegible]	— " —	[illegible]
42	[illegible]	— " —	[illegible]
43	[illegible]	— " —	[illegible]
44	C. [illegible]	— " —	[illegible]
45	[illegible]	— " —	[illegible]
46	[illegible]	— " —	[illegible]
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51	[illegible]	[illegible]	[illegible]
52	[illegible]	[illegible]	[illegible]
53	[illegible]	— " —	[illegible]
54	[illegible]	— " —	[illegible]
55	[illegible]	— " —	[illegible]
56	[illegible]	— " —	[illegible]
57	[illegible]	— " —	[illegible]
58	[illegible]	— " —	[illegible]
59	[illegible]	— " —	[illegible]
60	[illegible]	— " —	[illegible]
61	[illegible]	— " —	[illegible]
62	[illegible]	— " —	[illegible]
63	[illegible]	[illegible]	[illegible]
64	[illegible]	[illegible]	[illegible]
65	[illegible]	[illegible]	[illegible]
66	[illegible]	[illegible]	[illegible]
67	[illegible]	[illegible]	[illegible]

8/2/23

68	Dondeng Angelous	Digital Editing	[illegible]
69	[illegible]	[illegible]	[illegible]
70	Sohaib [illegible]		[illegible]
71	[illegible]	[illegible]	[illegible]
72	[illegible]	[illegible]	[illegible]
73	[illegible]	[illegible]	[illegible]
74	[illegible]	[illegible]	[illegible]
75	S. S. Balankar	[illegible]	[illegible]
76	S. B. [illegible]	[illegible]	[illegible]
77	[illegible]	[illegible]	[illegible]
78	Vinod [illegible]	[illegible]	[illegible]
79	[illegible]	—"—	[illegible]
80	[illegible]	—"—	[illegible]
81	[illegible]	—"—	[illegible]
82	[illegible]	—"—	[illegible]
83	[illegible]	—"—	[illegible]
84	[illegible]	[illegible]	[illegible]
85	P. S. [illegible]	[illegible]	[illegible]
86	[illegible]	[illegible]	[illegible]
87	[illegible]	[illegible]	[illegible]
88	[illegible]	[illegible]	[illegible]
89	[illegible]	[illegible]	[illegible]
90	[illegible]	[illegible]	[illegible]
91	[illegible]	[illegible]	[illegible]
92	[illegible]	[illegible]	[illegible]
93	[illegible]	[illegible]	[illegible]
94	[illegible]	[illegible]	[illegible]

Sign 8/2/2023

95	[illegible] Kanojia	[illegible]	[illegible]
96	[illegible] Dhurde	E.P. [illegible]	[illegible]
97	[illegible] Balki	E.P. Officer	[illegible]
98	[illegible] V. Mahajan	Contractor	[illegible]
99	[illegible]	E.P. [illegible]	[illegible]
100	S. K. Vaidya	Teacher	[illegible]
101	S. Nirgude	E.P. Officer	[illegible]
102	[illegible] Kumar	Asst. [illegible]	[illegible]
103	[illegible]	DCP	[illegible]
104	[illegible]	Ele.	[illegible]
105	[illegible]	[illegible]	[illegible]
106	[illegible] Singh	[illegible]	[illegible]
107	S. K. [illegible]	Fitter	[illegible]
108	[illegible]	Draft. Opt.	[illegible]
109	[illegible] Shankhalkar	[illegible]	[illegible]
110	[illegible] Kumar	[illegible] Edition	[illegible]
111	[illegible]	[illegible]	[illegible]
112	Rajinder Kumar	[illegible]	[illegible]
113	[illegible]	[illegible]	[illegible]
114	[illegible]	[illegible]	[illegible]
115	[illegible]		[illegible]
116	Ranjeet [illegible]	[illegible]	[illegible]
117	[illegible] Kumar	[illegible]	[illegible]
118	[illegible]	[illegible]	[illegible]
119	[illegible]	[illegible]	[illegible]
120	[illegible]	Workshop	[illegible]
121	[illegible]	E.P. Officer	[illegible]
122	[illegible]	E.P. [illegible]	[illegible]
123	[illegible]	[illegible]	[illegible]
124	D. R. [illegible]	[illegible]	[illegible]

124	[illegible]	[illegible]	[illegible]
125	[illegible]	[illegible]	[illegible]
126	[illegible]	[illegible]	[illegible]
127	[illegible]	[illegible]	[illegible]
128	[illegible]	[illegible]	[illegible]
129	[illegible]	[illegible]	[illegible]
130	[illegible]	[illegible]	[illegible]
131	[illegible]	[illegible]	[illegible]
132	[illegible]	[illegible]	[illegible]
133	[illegible]	[illegible]	[illegible]
134	[illegible]	[illegible]	[illegible]
135	[illegible]	[illegible]	[illegible]
136	[illegible]	[illegible]	[illegible]
137	[illegible]	[illegible]	[illegible]
138	[illegible]	[illegible]	[illegible]
139	[illegible]	[illegible]	[illegible]
140	[illegible]	[illegible]	[illegible]
141	[illegible]	[illegible]	[illegible]
142	[illegible]	[illegible]	[illegible]
143	[illegible]	[illegible]	[illegible]
144	[illegible]	[illegible]	[illegible]
145	[illegible]	[illegible]	[illegible]
146	[illegible]	[illegible]	[illegible]
147	[illegible]	[illegible]	[illegible]
148	[illegible]	[illegible]	[illegible]
149	[illegible]	[illegible]	[illegible]
150	[illegible]	[illegible]	[illegible]
151	[illegible]	[illegible]	[illegible]

Date: 9-2-2023

152	[illegible]	[illegible]	
153	[illegible]	[illegible]	
154	[illegible]	[illegible]	
155	[illegible]	[illegible]	
156	[illegible]	[illegible]	
157	[illegible]	[illegible]	
158	[illegible]	[illegible]	
159	[illegible]	[illegible]	
160	[illegible]	[illegible]	
161	[illegible]	[illegible]	
162	[illegible]	[illegible]	
163	[illegible]	[illegible]	
164	[illegible]	[illegible]	
165	[illegible]	[illegible]	
166	[illegible]	[illegible]	
167	[illegible]	[illegible]	
168	[illegible]	[illegible]	
169	[illegible]	welder	
170	[illegible]	welder	
171	[illegible]	[illegible]	
172	[illegible]	[illegible]	
173	[illegible]	[illegible]	
174	[illegible]	[illegible]	
175	[illegible]	Contractor	
176	[illegible]	Contractor	
177	[illegible]	[illegible]	
178	[illegible]	Contractor	
179	[illegible]	[illegible]	
180	[illegible]	[illegible]	
181	[illegible]	[illegible]	

182	[illegible]	mechanic	
183	[illegible]	mechanic	
184	N.N. Bonye	mechanic	
185	M.K. Mondal	[illegible]	
186	Rajesh Thakur	[illegible]	
187	[illegible]	Editing Editor	
188	[illegible]	[illegible]	
189	Mandella [illegible]	Electrician	
190	Tingat [illegible]	Elec. [illegible]	
191	Bade [illegible]	[illegible]	
192	[illegible]	Station [illegible]	
193	R. T. [illegible]	S.O.S [illegible]	
194	Rajesh [illegible]	Electrician	
195	W.O. Mangye	F.S. [illegible]	
196	D. A. [illegible]	Elec/H.	
197	[illegible]	G.D	
198	Sisak [illegible]	[illegible]	
199	[illegible]	[illegible]	
200	K.K. [illegible]	F/S	
201	Rout Dhanda	F/m	
202	[illegible]	F/m	
203	R.B. [illegible]	F/m	
204	[illegible]	E.P. Fitter	
205	[illegible]	E.P. Fitter	
206	[illegible]	E.P. Fitter	
207	[illegible]		
208	[illegible]	[illegible]	
209	[illegible]	[illegible]	
210	[illegible]	[illegible]	
211	[illegible]	[illegible]	

212	[illegible]	[illegible]	[illegible]
213	N. A. [illegible]	[illegible]	[illegible]
214	[illegible]	[illegible]	[illegible]
215	[illegible]	[illegible]	[illegible]
216	[illegible]	[illegible]	[illegible]
217	[illegible]	[illegible]	[illegible]
218	[illegible]	[illegible]	[illegible]
219	[illegible]	[illegible]	[illegible]
220	[illegible]	[illegible]	[illegible]
221	[illegible]	[illegible]	[illegible]
222	[illegible]	[illegible]	[illegible]
223	[illegible]	[illegible]	[illegible]
224	[illegible]	[illegible]	[illegible]
225	[illegible]	[illegible]	[illegible]
226	[illegible]	[illegible]	[illegible]
227	[illegible]	[illegible]	[illegible]
228	[illegible]	[illegible]	[illegible]
229	R. T. [illegible]	[illegible]	[illegible]
230	[illegible]		[illegible]
231	[illegible]	FOREMAN	[illegible]
232	M. M. [illegible]	[illegible]	[illegible]
233	[illegible]	[illegible]	[illegible]
234	[illegible]	[illegible]	[illegible]
235	[illegible]	[illegible]	[illegible]
236	[illegible]	[illegible]	[illegible]
237	[illegible]	[illegible]	[illegible]
238	[illegible]	[illegible]	[illegible]
239	[illegible]	[illegible]	[illegible]
240	[illegible]	[illegible]	[illegible]
241	[illegible]	[illegible]	[illegible]

Ean 11/05 105

	Name	Designation	Date	Night	Evening	Sign
88	R. D. [illegible]	[illegible]	5/10/22	01		
89	[illegible]	[illegible]	-/-/-	01	01	
90	[illegible]	[illegible]	-/-/-	01		
91	[illegible]	[illegible]	-/-/-	01	01	
92	[illegible]	[illegible]	11/10/22	01		
93	[illegible]	[illegible]	-/-/-	01		
94	[illegible]	[illegible]	12/10/22	01		
95	[illegible]	[illegible]	-/-/-	01	01	
96	[illegible]	[illegible]	2/5/	01		
97	[illegible]	[illegible]	5/422	01		
98	[illegible]	[illegible]	-/-/-	01	01	
99	[illegible]	[illegible]	-/-/-	01		
100	[illegible]	[illegible]	-/-/-	01	01	
101	[illegible]	[illegible]	-/-/-	01		
102	[illegible]	[illegible]	5/1/22			
103	[illegible]	[illegible]	5/1/22	01	01	
104	[illegible]	[illegible]	-/-/-	01		
105	[illegible]	[illegible]	-/-/-	01		
106	[illegible]		-/-/-	01	01	
107	[illegible]	[illegible]	-/-/-	01		
108	[illegible]	[illegible]	6/5/22	01		
109	[illegible]	[illegible]	6/1/22	01	01	
110	[illegible]	[illegible]	-/-/-	01		
111	[illegible]	[illegible]	-/-/-	01		
112	[illegible]	[illegible]	3/6/22	01	01	
113	[illegible]	[illegible]	-/-/-	01		
114	[illegible]	[illegible]	-/-/-	01	01	

Exam. Staff

115	B.R. Dhara	Peon	8/12/22	01		
116	G. Angadi	C/O	—"—	01	01	
117	[illegible]	D/O	—"—	01		
118	V. D. [illegible]	C/O	—"—	01	01	
119	B. S. Gonda	D/O	—"—	01		
120	K. O. Mallapur	D/O	—"—	01	01	
121	N. N. [illegible]	C/O	11/8/22	01		
122	N. M. [illegible]	—"—	—"—	01		
123	H. B. [illegible]	—"—	—"—	01	01	
124	S. A. [illegible]	—"—	—"—	01		
125	[illegible]	Peon	15/9/22	01		
126	[illegible]	—"—	—"—	01	01	
127	[illegible]	—"—	—"—	01	01	
128	M. [illegible]	—"—	—"—	01		
129	[illegible]	—"—	—"—	01	01	
130	[illegible]	D/O	3/10/22	01		
131	[illegible]	D/O	—"—	01	01	
132	[illegible]	C/O	—"—	01		
133	[illegible]	C/O	—"—	01		
134	[illegible]	C/O	—"—	01		
135	R. B. [illegible]	C/O	—"—	01	01	
136	[illegible]	D.C.O.	—"—	01		
137	[illegible]	Dep. Ch.	—"—	01		
138	[illegible]	Dep. Ch.	11/10/22	01		
139	[illegible]	Dep. Ch.	—"—	01	01	
140	[illegible]	—"—	—"—	01		
141	[illegible]	C/O	—"—	01		
142	[illegible]	D.C.O.	—"—	01		
143	[illegible]	D.C.O.	13/10/22	01		
144	[illegible]	Bal. [illegible]	—"—	01		
145	G. [illegible]	D.C.O.	—"—	01		
146	R. [illegible]	Dep. C.	—"—	01		

Exam notice

	Name	Designation	Reporting time	Exam duty	Invigilation duty	Sign
156	B.G. Sonar	Prof.	[illegible]	01	01	
157	S. Reddy	Prof.	—"—	01	01	
158	[illegible]	[illegible]	—"—	01	01	
159	[illegible]	[illegible]	[illegible]	01	01	
160	[illegible]	[illegible]	—"—	01	01	
161	[illegible]	[illegible]	—"—	01	01	
162	[illegible]	[illegible]	—"—	01	01	
163	[illegible]	[illegible]	—"—	01	01	
164	[illegible]	[illegible]	—"—	01	01	
165	[illegible]	[illegible]	—"—	01	01	
166	R. [illegible]	[illegible]	—"—	01	01	
167	[illegible]	[illegible]	—"—	01	01	
168	[illegible]	[illegible]	—"—	01	01	
169	[illegible]	[illegible]	[illegible]	01	01	
170	[illegible]	[illegible]	[illegible]	01	01	
171	[illegible]	[illegible]	—"—	01	01	

432	[illegible]	[illegible]	[illegible]	
433	[illegible]	[illegible]	— " —	
434	[illegible]			
435	Rabbi [illegible]	MLS	[illegible]	[illegible]
436	Devendra pandey	Asst. [illegible]	— " —	
437	[illegible]	MLS	[illegible]	[illegible]
438	Rajesh Pandey	MLS	28/12/20	[illegible]
439				
440	[illegible]	[illegible]	[illegible]	[illegible]

1 Shambhu prasad — 23.8.22
2 P. N. Pyre — " —
3 D. N. Gaikwad — D.P.H. — " —
4 Gangadhar Dubey — " —
5 Balakant Badekar — " —
6 Satyendra prasad — " —
7 P. N. Bachhane — " —
8 Bharat — " —
9 B. B. Tilhal — " —
10 P. S. Borankar — " —
11 V. W. Wagare — " —
12 H. P. Wandile — " —
13 Gopal Das — " —
14 Pradip Sonkhare — " —
15 Sunil Waghmare — " —
16 Mahesh Bonde — " —
17 Rajesh Thakre — " —
18 Nand Bhale — " —
19 Nikita Sir — " —
20 Sant Chandan — Backing Clerk — " —
21 Bashist Badhake — " — — " —

22.	Prakash Prasad	[illegible]	[illegible]	
23.	Prabath Prasad	— " —	— " —	
24.				
25.	Raini Singh	[illegible]	[illegible]	1
26.	Krishna [illegible]	— " —	[illegible]	5
27.	[illegible]		[illegible]	
28.	Sandeep K. Yadav	[illegible]	[illegible]	
29.	Rishi Sundar [illegible]	M/F	[illegible]	
30.	Sachin [illegible]	[illegible]	[illegible]	
31.	Deepak Kumar	[illegible]	[illegible]	2
32.	Shiv Kar	[illegible]	[illegible]	

Duty mark

Date	S.No.	Name	[illegible]	Signature
03.01.23	1.	Bilash [illegible]	1	[illegible]
"	2.	[illegible]	1	[illegible]
"	3	Sahjad	1	[illegible]
"	4	Ranjit [illegible]	1	[illegible]
"	5	[illegible]	1	[illegible]
03.01.23	6	Sachin [illegible]	1	[illegible]
"	7	Pankaj K. [illegible]	1	[illegible]
"	8	Indra Kumar	1	[illegible]
"	9.	[illegible]	1	[illegible]
03.01.23	10	[illegible]	1	[illegible]
"	11	Sachin [illegible]	1	[illegible]
"	12	[illegible]	1	[illegible]
"	13	Ram [illegible]	1	[illegible]
"	14	[illegible]	1	[illegible]
"	15	[illegible]	1	[illegible]
"	16	Rahul [illegible]	1	[illegible]
"	17	[illegible]	1	[illegible]
"	18	[illegible]	1	[illegible]
"	19	[illegible]	1	[illegible]

Dust Mask

Sr. No.	Issue Date	Name	Designation	Signature
635	25-12-2020	[illegible]	[illegible]	[illegible]
636	"	[illegible]	[illegible]	[illegible]
637	"	[illegible]	[illegible]	[illegible]
638	28-12-20	[illegible]	[illegible]	[illegible]
639	"	[illegible]	[illegible]	[illegible]
640	"	[illegible]	[illegible]	[illegible]
641	29-12-2020	[illegible]	[illegible]	[illegible]
642	"	[illegible]	[illegible]	[illegible]
643	"	[illegible]	[illegible]	[illegible]
644	"	[illegible]	[illegible]	[illegible]
645	30-12-2020	[illegible]	[illegible]	[illegible]
646	"	[illegible]	[illegible]	[illegible]
647	"	[illegible]	[illegible]	[illegible]
		Contractor		
648	02-01-21	[illegible]	[illegible]	[illegible]
649	"	[illegible]	[illegible]	[illegible]
650	"	[illegible]	[illegible]	[illegible]
651	"	Ram [illegible]	[illegible]	Ramesh
652	"	[illegible]	[illegible]	[illegible]
653	"	[illegible]	[illegible]	[illegible]
654	"	Rahul [illegible]	[illegible]	[illegible]
655	"	[illegible]	[illegible]	[illegible]
656	"	[illegible]	[illegible]	[illegible]
657	"	[illegible]	[illegible]	[illegible]
658	"	[illegible]	[illegible]	[illegible]
659	04-01-2021	[illegible]	[illegible]	[illegible]
660	"	[illegible]	[illegible]	[illegible]
661	"	Shahid [illegible]	[illegible]	[illegible]

Dust mask 39

S.No	Issue Date	Name	Designation	Signature
661	12.01.23	Shajnul Hussain	Boiler Attd	[illegible]
662	"	Rishikesh Singh	T-operator	Rishikesh Singh
663	"	Vijeet Ram	T-operator	Vijeet Ram
664	"	Sheo Deo Bangla	T-operator	[illegible]
665	"	Nagendra Pasi	T-operator	[illegible]
667	"	Pramod Kumar	Supervisor	[illegible]
668	12.01.23	Pinku Gupta	T-operator	[illegible]
669	"	Pankaj Thakur	T-operator	[illegible]
670	"	M.D. Akhtar	Boiler Attd	[illegible]
671	"	Lalchand Prasad	Boiler Attd	[illegible]
672	"	Sughlam Ram	Boiler Attd	[illegible]
673	"	Rajesh Bindra	T-operator	[illegible]
674	13.01.23	Pankaj Kumar	T-operator	[illegible]
675	"	Ramesh Kumar Patel	T-"	[illegible]
676	"	Sandeep Pandey	T-"	[illegible]
677	"	Raj Sharma	T-"	[illegible]
678	"	Mahanand Mishra	Supervisor	[illegible]
679	"	Ranjit Kumar	Sr. Fitter	[illegible]
680	20.01.23	Vikash Pal	T-operator	Vikash Pal
681	"	Shakti Rajput	T-operator	[illegible]
682	"	Bikash Kumar	T-"	Bikash Kumar
683	"	Pawan Ram	T-"	[illegible]
684	"	Bodruddin Sekh	T-"	[illegible]
685	"	Bijay Pratap Prasad	T-"	[illegible]
686	21.01.23	Sanjit Kumar Shaha	T-" (Dry)	[illegible]
687	"	Chandrakant Shah	T-" (Dry)	[illegible]
688	"	Manish Tiwari	T-"	[illegible]
689	"	Sohan Yadav	[illegible]	[illegible]
690	"	Sohan Kumar	Management Trainee	[illegible]
691	"	Vijay Kumar	Management Trainee	[illegible]

S.No	Date	Name	Designation	Signature
682	03-02-22	Vikas Kumar	[illegible]	[illegible]
683	"	Chandra Bhaga	[illegible]	[illegible]
684	"	[illegible]	[illegible]	[illegible]
685	"	Rajendra [illegible]	T-Operator	[illegible]
686	"	Shahnawaj [illegible]	T-Operator	[illegible]
687	"	Rajmani [illegible]	T-Operator	[illegible]
688	03-02-22	[illegible] Yadav	T-Operator	[illegible]
689	"	[illegible]	T-Operator	[illegible]
690	"	Devendra Kumar	[illegible]	[illegible]
691	"	Kumkumakushwaha	[illegible]	[illegible]
692	"	Vikas Kumar Singh	[illegible]	[illegible]
693	"	Bhartendra Kumar	[illegible]	[illegible]
694	"	Brijesh Sahni	[illegible]	[illegible]
695	10-02-22	Krishna Singh	[illegible]	[illegible]
696	"	Manish [illegible]	[illegible]	[illegible]
697	"	Ram Yadav [illegible]	[illegible]	[illegible]
698	"	Rajesh Yadav	[illegible]	[illegible]
699	10-02-22	[illegible] Gaur	[illegible]	[illegible]
700				
701				
702				
703				
704				
705				
706				
707				
708				
709				
710				
711				

Annexure 31

1	2	3	4	5	6	7	8	9	10	11	12
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1	[illegible]	[illegible]	V	[illegible]	[illegible]	[illegible]	[illegible]	10	[illegible]	[illegible]	[illegible]
2	[illegible]	[illegible]	III	[illegible]	[illegible]	[illegible]	[illegible]	10	[illegible]	[illegible]	[illegible]
3	[illegible]	[illegible]	II	[illegible]	[illegible]	[illegible]	[illegible]	18	[illegible]	[illegible]	[illegible]
4	[illegible]	[illegible]	IV	[illegible]	[illegible]	[illegible]	[illegible]	18	[illegible]	[illegible]	[illegible]
5	[illegible]	[illegible]	III	[illegible]	[illegible]	[illegible]	[illegible]	10	[illegible]	[illegible]	[illegible]
6	[illegible]	[illegible]	VII	[illegible]	[illegible]	[illegible]	[illegible]	10	[illegible]	[illegible]	[illegible]
7	[illegible]	[illegible]	IV	[illegible]	[illegible]	[illegible]	[illegible]	10	[illegible]	[illegible]	[illegible]
8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	10	[illegible]	[illegible]	[illegible]

Sub Divisional Officer
[illegible]

Executive Engineer
[illegible]

S.No	Date of commencement	Nature of work	Name	Designation	Place of training	Timings		Remarks during training	Remarks
						Start	End		
6	15-2-21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—	
10	24-2-21	—"—	[illegible]	[illegible]	[illegible]	8:30 am	4:30 pm	—	
[illegible]	17-2-21	[illegible]	[illegible]	[illegible]	[illegible]	9:00 am	5:00 pm		
[illegible]	16-4-21	[illegible]	[illegible]	[illegible]	[illegible]	8:30 am	[illegible] pm		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4:30 pm		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	9:00 am	5:00 pm		
		[illegible]	[illegible]	[illegible]	[illegible]	8:30 am	4:30 pm		
		Safety Officer			Safety Officer				
[illegible]	29/3/21	[illegible]	[illegible]	[illegible]	[illegible]	8:30 am	4:30 pm	—	
[illegible]	13/3/21	[illegible]	[illegible]	[illegible]	[illegible]	8:30 am	4:30 pm	—	
[illegible]	15-03-21	[illegible]	[illegible]	[illegible]	[illegible]	8:30 am	4:30 pm	—	
[illegible]	20-03-21	[illegible]	[illegible]	[illegible]	[illegible]	8:30 am	4:30 pm	—	
[illegible]	10-4-21	[illegible]	[illegible]	[illegible]	[illegible]	8:30 am	4:30 pm	—	
[illegible]	12-4-21	[illegible]	[illegible]	[illegible]	[illegible]	8:15	4:15 pm	—	
[illegible]	25-01-21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—	
[illegible]	17-2-21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—	
[illegible]	25-01-21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—	

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
22	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
27	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
30	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
34	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
37	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Energy Efficient Lights in NMUG to OC Mine 2018-2023

NMUG to OC Mine has stressed upon installing energy efficient lights at various work places like – Coal Face, Coal Stock, OB Dump, Haul Road, Offices and even the colonies. In view of this, conventional lights are being continuously replaced with energy efficient LED lights. This has led to save huge amount of power. The following chart tabulates the different types of LED installed in NMUG to OC Mine since 01.04.2018.

Sr. No.	LED Type	Quantity
1.	20W Tube	95
2.	30W	113
3.	45W	235
4.	100W	84
5.	150W	8
6.	400W (High Mast Lighting Tower)	40

Energy Saved
The amount of energy saved can be understood through the following examples.

1. Street lights in the mine are being equipped with 45W LED

∴ Total wattage = 45W X 235nos. = 10,575W
Least available HPSV lights = 250W
∴ Total wattage for same number of HPSVs= 250W X 235nos. = 58,750W
Hence, energy saved (assuming 12hrs. of operation) = (58750-10,575)W X 12 h = 578.1 kWh

2. Offices and Quarters are being equipped with 20W LED tube lights

∴ Total wattage = 20W X 95nos. = 1,900W
Available fluorescent lights = 100W
∴ Total wattage for same number of fluorescent lights = 100W X 95nos. = 9,500W
Hence, energy saved (assuming 12hrs. of operation) = (9500-1900)W X 12 h = 91.2 kWh

Solar Power Installations under Renewable Energy

Introduction

Solar PV Power Generation:
Sunlight is converted to electricity directly when made to fall on solar photovoltaic (SPV) modules. Systems /devices are made for various applications based on SPV modules connected with suitably designed power conditioning units for meeting electricity requirements.

Grid connected roof top solar PV System: Available roof-top area on the buildings can also be used for setting up solar PV power plants, and thus dispensing with the requirement of free land area. The electricity generated from SPV systems can also be fed to the distribution or transmission grid after conditioning to suit grid integration.

Advantages:
The grid connected roof top solar PV system would fulfill the partial/full power needs of large scale buildings. The following are some of the benefits of roof top SPV systems: Generation of environmentally clean energy.

- Consumer becomes generator for his own electricity requirements.
- Reduction in electricity consumption from the grid.
- Reduction in diesel consumption wherever DG backup is provided.
- Feeding excess power to the grid.

Solar Power Installations in WCL Majri Area

Majri Area has 02 Nos. On Grid Roof Top Solar Plants with installed capacity of 32 kWp and 86 kWp for large buildings structures i.e. Kendriya Vidyalaya Campus and AGM Office Complex in Kuchana Housing Complex since July-2018

- Further Proposals for large scale Solar Power Plants are in motion for Majri Area as large land bank is available to WCL by virtue of exhausted coal reserves in some of the mines of Majri Area and geographical location suitable for large solar radiation.

PHOTOGRAPHS OF SOLAR ROOF TOP SOLAR INSTALLATION

Annexure 34

S.No.	Name of the Document	Date/Server	Date of Receipt of Delivery	Date of Receipt	Signature	[illegible]	[illegible]	[illegible]	[illegible]	Remark
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]					
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]					
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]					
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]					
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]					
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]					

20-01-2022

S.No.	Name of the Laboratory	Lab / Teacher	Max. Laboratory marks to be awarded for CIA (Out of 75)		Remarks
5.	Computer Aided Machine Drawing	[illegible]	[illegible]	10 M	
6.	Foundry Technology		[illegible]	20 M	
7.	Glass and Ceramics		[illegible]	[illegible]	
8.	Electrical and Electronics		[illegible]	20 M	
9.	Basic Electrical and Electronics Engineering		[illegible]	20 M	
10.	Heat Transfer		[illegible]	20 M	
11.	Thermal Lab		[illegible] (Out) [illegible] (int)	20 M	
12.	Refrigeration and AC			20 M	
13.	Machine Drawing (1) Machine Drawing (2)		[illegible] M [illegible]	[illegible]	
14.	Mechanical Design		—	10 M (Int)	

20-07-2022

S.No	Name of the Work	Est. Amount	Amount to be released for the month of July	Amount released	Date	Time	Place	Remarks
1.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
2.	[illegible]			[illegible]				[illegible]
3.	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	
4.	[illegible]	[illegible]	[illegible]	[illegible]				
5.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
6.	[illegible]		[illegible]	[illegible]				
7.	[illegible]		—	[illegible]	[illegible]	[illegible]	[illegible]	

July – 2022

20.07.2022

S.No	Date & Time Slot	Lab/Venue	Name of the Experiment to be Performed for the Day		Staff	Signature of the Staff	Signature of the Lab Assistant	Signature of the Examiner	Remarks
			Regular	Pre-lab					
8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
9	[illegible]	[illegible]	[illegible]	[illegible]					
10	[illegible]		[illegible]	[illegible]					
11	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
12	[illegible]		[illegible]	[illegible]					
13	[illegible]		[illegible]	[illegible]					
14	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
15	[illegible]		[illegible]	[illegible]					
16	[illegible]		[illegible]	[illegible]					
17	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

Sr.	Date & Hr. Demanded	Dept.	Nature of Work Demanded by Dept.	Trouble to be Attended	Sign.	Sign.	Sign.	Remarks
2.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
3.	[illegible]	—	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3.	[illegible]		—	[illegible]	[illegible]	[illegible]	[illegible]	
5.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
5.	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
6.	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
7.	[illegible]		—	[illegible]	[illegible]	[illegible]	[illegible]	

AUGUST - 2022

Sl. No.	Name of the Patient	Sex / Age	Pre-denudation of the Graft in (cm²)		NPT Done	Cell Bank Done	Cultured	Cultured Weight	Remarks
			(cm²)	(cm²)					
1.	[illegible]	[illegible]	[illegible]	[illegible]					
2.	[illegible]	[illegible]	[illegible]	[illegible]					
3.	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
4.	[illegible]		[illegible]	[illegible]					
5.	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
6.	[illegible]		[illegible]	[illegible]					
7.	[illegible]		[illegible]	[illegible]					
8.	[illegible]		[illegible]	[illegible]					
9.	[illegible]		[illegible]	[illegible]					
10.	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
	[illegible]		[illegible]	[illegible]					
11.	[illegible]		[illegible]	[illegible]					

[illegible] — 2004

[illegible]

Sl. No.	[illegible]	Source	[illegible] Reading	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Remarks
1	[illegible]	[illegible]	[illegible]	[illegible]					
2	[illegible]	—	—	[illegible]					[illegible]
3	[illegible]		—	[illegible]					
4	[illegible]	[illegible]	[illegible]	[illegible]					
5	[illegible]	[illegible]	[illegible]	[illegible]					
6	[illegible]			[illegible]					
7	[illegible]		—	[illegible]					

S.No.	Name of the Transformer	Make / location	Pole designation to be marked for each		NOC Obtained	Pole tags fixed	Safety notices	Caution Plates	Remarks
			Primary	Secondary					
8	Prabhakar Jolly / [illegible]	[illegible]	[illegible]	10 H	[illegible]	[illegible]	[illegible]	[illegible]	
9	Pradeep Kathuria	[illegible]	[illegible]	[illegible]					
10	Raj [illegible]		[illegible]	[illegible]					
11	Chowk [illegible]		2.5 H	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
12	[illegible]		[illegible]	[illegible]					
13	[illegible]		[illegible]	[illegible]					
14	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
15	[illegible]		[illegible]	[illegible]					
16	[illegible]		[illegible]	[illegible]					
17	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

October — 2007

Sl.	Name of the Element	Cal / Check	Reading on 25/10/07	Reading on [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Remark
1.	Line Power Supply Voltage	[illegible]	[illegible]	[illegible]					
	Line Current, Input Power	[illegible]	[illegible]						
		[illegible]	[illegible]						
		[illegible]	[illegible]						
		[illegible]	[illegible]						
2.	Building Vibration	—	—	[illegible]					[illegible]
3.	[illegible]		—	[illegible]					
4.	[illegible]	[illegible]	[illegible]	[illegible]					
		[illegible]	[illegible]						
		[illegible]	[illegible]						
5.	[illegible]	[illegible]	[illegible]	[illegible]					
		[illegible]	[illegible]						
		[illegible]	[illegible]						
6.	[illegible]	[illegible]	[illegible]	[illegible]					
		[illegible]	[illegible]						
		[illegible]	[illegible]						
7.	[illegible]		[illegible]	[illegible]					
	[illegible]		—	[illegible]					

October — 2002

Sl. No.	Name of the Particulars	Unit/Quantity	Qty. Det. Subsidy	Provided	Work done	Work done	Work done	Work done	Remarks
8.	[illegible]	[illegible]	[illegible]	[illegible]					
		[illegible]							
9.	[illegible]		[illegible]	[illegible]					
10.	[illegible]		[illegible]	[illegible]					
11.	[illegible]		[illegible]	[illegible]					
12.	[illegible]		[illegible]	[illegible]					
13.	[illegible]		[illegible]	[illegible]					
14.	[illegible]		[illegible]	[illegible]					
15.	[illegible]	[illegible]	[illegible]	[illegible]					
16.	[illegible]		[illegible]	[illegible]					
17.	[illegible]		[illegible]	[illegible]					
18.	[illegible]		[illegible]	[illegible]					

Annexure 35

New Majri UG to OC Mine

Capital and Revenue Expenditure Under Environment Head

CAPITAL

Account head	Expenditure as on 31.03.2023
Reclamation (HEMM)	Nil
Air pollution control	Rs. 35.88 lakhs
Water pollution control	Rs. 45.51 lakhs
Others	Rs 70.31 Lakhs

REVENUE

Account head	Expenditure as on 31.03.2023
Afforestation	Rs 178.72 Lakhs
Monitoring	Rs 108.34 Lakhs
MPCB JVS	Rs 1.81 Lakhs
Statutory expenses	Rs 218.70 Lakhs
Water pollution control	Rs 79.77 Lakhs
Air pollution control	Rs 11.12 Lakhs
Rain water harvesting pond	Rs 7.62 Lakhs
Garland drain	Rs 4.37 Lakhs
Misc. works	Rs 6.43 Lakhs
CAAQMS AMC	Rs. 4.99 lakhs
Ground Water Abstraction Charges	Rs. 86.10 Lakhs

Annexure 36

Under Jurisdiction of Nagpur Court only

वेस्टर्न कोलफील्ड्स लिमिटेड
Western Coalfields Limited
(A Miniratna Company)
(A Subsidiary of Coal India Limited)

पर्यावरण विभाग

आईएसओ 9001:2015 प्रमाणित

Email- gmenvironment@westerncoal.gov.in
CIN - U10100MH1976GOI015628

Environment Department

ISO 9001:2015 Certified

TELE/FAX: 0712-3510161
www.westerncoal.nic.in

कोल एस्टेट, सिविल लाइन्स, नागपुर (महाराष्ट्र) - 440001 (Regd. Off.: Coal Estate, Civil Lines, Nagpur (MS) - 440001)

संदर्भ संख्या /Ref.No.: वेकोलि/ मुख्यालय/ पर्यावरण/16-Pr/ 508-519 दिनांक /Date 24.05.2022

प्रति,

क्षेत्रीय महाप्रबंधक,

वेस्टर्न कोलफील्ड्स लिमिटेड

बल्लारपुर / चंद्रपुर / माजरी / वणी /

वणी नॉर्थ / नागपुर / उमरेड /

पेंच / कन्हान एवं पेंचखंडा क्षेत्र।

विषय:- Internal Monitoring of Environmental Compliances (EC/FC conditions)

संदर्भ : e-office file E- 746506 dated 04.05.2022.

Sir,

This has reference to the competent approval for inter area inspection program for 1st QTR of FY 2022-23 vide e-office file E- 746506 dated 04.05.2022 as part of Internal Monitoring mechanism for compliance of EC and FC conditions.

The inter area inspection program for 1st QTR of FY 2022-23 along with schedule for inspection for each area and tour approval is attached as **Annexure – I**.

Therefore, you are kindly requested to advise respective committee at your areas to prepare for the internal inspection of their concerned area and conduct the inspection of other areas vice – versa as per the schedule given.

The format for monitoring of compliance status of EC/FC conditions during inspection as received from CIL, Kolkata is enclosed as **Annexure – II**. In this regard, we would like to apprise you that committee members may kindly be advised to give special attention to the following:

1. Pollution control measures with respect to Air Quality & Effluent
2. Operation & Maintenance of CAAQMS
3. Operation of latest pollution control measures such as fog canon, sweeping machine, etc.
4. Status of all the conditions in EC/FC should be mentioned in the formats.

The FC checklist shall also be collected by the team during the inspection if there is forest land is involved in the project / mine.

The Inspection Report in the above-mentioned format in respect of each area wise / mine wise may kindly be submitted within 10 days after completion of inspection positively for appraisal to subsidiary level committee.

Matter may please be treated on priority.

Encl: as above.

भवदीय,

महाप्रबंधक / विभागाध्यक्ष (पर्यावरण)

प्रतिलिपि :

1. तकनिकी सचिव - निदेशक (तकनिकी) / संचालन, कोलिंडि (मु.), नागपुर.
2. तकनिकी सचिव - निदेशक (तकनिकी) परियोजना एवं योजना, कोलिंडि (मु.), नागपुर.

ANNEXURE- I

Inter Area Inspection Schedule from 10th to 30th June 2022

Sl.No.	Inspecting Area	Area to be inspected	Schedule	HQ Team
1	Kanhan	Pathakhera	14.06.2022 & 15.06.2022	Team "A"
2	Nagpur	Umrer	24.06.2022 & 25.06.2022	Team "E"
3	Umrer	Nagpur	14.06.2022 to 18.06.2022	Team "E"
4	Parsoli	Kanhan	29.06.2022 & 30.06.2022	Team "D"
5	Pathakhera	Parsoli	17.06.2022 & 18.06.2022	Team "D"
6	Majri	Chandrapur	13.06.2022 & 14.06.2022	Team "C"
7	Ballarpur	Majri	27.06.2022 & 28.06.2022	Team "B"
8	Chandrapur	Wani	20.06.2022 & 21.06.2022	Team "B"
9	Wani North	Ballarpur	10.06.2022 & 11.06.2022	Team "A"
10	Wani	Wani North	27.06.2022 & 28.06.2022	Team "C"

Team "A" – Shri. C.S.Reddy & Shri. K.Rakesh
Team "B" – Shri. V.P.Ghatuwar & Smt. P. Dhriyya
Team "C" – Shri. Satish R.Gabale & Arati Badekurhe
Team "D" – Shri. Pramod Kumar Nigam & Smt. Shruti Chawda
Team "E" – Shri. Satyabadi Kumar Jena & Smt. Anu Roby

DISPLAY BOARD
NEW MAJRI UG TO OC MINE

Annexure 37

Maharashtra Pollution Control Board
महाराष्ट्र प्रदूषण नियंत्रण मंडळ

FORM V
(See Rule 14)
Environmental Audit Report for the financial Year ending the 31st March 2023

Unique Application Number	Submitted Date
MPCB-ENVIRONMENT_STATEMENT-0000056782	05-09-2023

PART A

Company Information

Company Name	Application UAN number
New Majri Underground to OC Mine	MPCB-CONSENT-00000101444

Address
New Majri UG to OC Mine, At: Majri, PO: Shivjinagar, Ta: Bhadrawati, District: Chandrapur, Maharashtra

Plot no	Taluka	Village
235-249	Bhadrawati	Shivjinagar
Capital Investment (In lakhs)	**Scale**	**City**
17314.5	LSI	Chandrapur
Pincode	**Person Name**	**Designation**
442503	Balmiki Prasad	Sub Area Manager
Telephone Number	**Fax Number**	**Email**
8275967138	07175285088	newmajriugtooc@gmail.com
Region	**Industry Category**	**Industry Type**
SRO-Chandrapur	Red	R35 Mining and ore beneficiation
Last Environmental statement submitted online	**Consent Number**	**Consent Issue Date**
yes	format1.0/CAC/UAN No. MPCB-CONSENT-0000160648/CR/2305000846	2023-05-12
Consent Valid Upto	**Establishment Year**	**Date of last environment statement submitted**
2024-03-31	2015	Aug 30 2022 12:00:00:000AM

Industry Category Primary (STC Code) & Secondary (STC Code)

Product Information

Product Name	Consent Quantity	Actual Quantity	UOM
Coal	3000000	1864212	Ton/Y

By-product Information

By Product Name	Consent Quantity	Actual Quantity	UOM
NA	0	0	CMD

Part-B (Water & Raw Material Consumption)

1) Water Consumption in m3/day

Water Consumption for	Consent Quantity in m3/day	Actual Quantity in m3/day
Process	100.00	50.00
Cooling	250.00	200.00
Domestic	10.00	5.00
All others	40.00	40.00
Total	400.00	295.00

2) Effluent Generation in CMD / MLD

Particulars	Consent Quantity	Actual Quantity	UOM
Daily Trade Effluent	3973	3000	CMD

2) Product Wise Process Water Consumption (cubic meter of process water per unit of product)

Name of Products (Production)	During the Previous financial Year	During the current Financial year	UOM
COAL(CUBIC METER/TONNE)	0.009	0.0072	

3) Raw Material Consumption (Consumption of raw material per unit of product)

Name of Raw Materials	During the Previous financial Year	During the current Financial year	UOM
EXPLOSIVES (KG/TONNE)	0.00024	0.00028	Ton/Ton

4) Fuel Consumption

Fuel Name	Consent quantity	Actual Quantity	UOM
HSD	0	6755.399	KL/A

Part-C

Pollution discharged to environment/unit of output (Parameter as specified in the consent issued)

[A] Water

Pollutants Detail	Quantity of Pollutants discharged (kL/day)	Concentration of Pollutants discharged(Mg/Lit) Except PH,Temp,Colour	Percentage of variation from prescribed standards with reasons		
	Quantity	Concentration	%variation	Standard	Reason
Monitoring report attached	0	0	-	-	-

[B] Air (Stack)

Pollutants Detail	Quantity of Pollutants discharged (kL/day)	Concentration of Pollutants discharged(Mg/NM3)	Percentage of variation from prescribed standards with reasons		
	Quantity	Concentration	%variation	Standard	Reason
NA	0	0	0	0	-

Part-D

HAZARDOUS WASTES

1) From Process

Hazardous Waste Type	Total During Previous Financial year	Total During Current Financial year	UOM
5.1 Used or spent oil	50.72	56.266	KL/A

2) From Pollution Control Facilities

Hazardous Waste Type	Total During Previous Financial year	Total During Current Financial year	UOM
2.2 Sludge containing oil	15.97	4	Ton/Y
5.2 Wastes or residues containing oil	2.24	1	Ton/Y

Part-E

SOLID WASTES

1) From Process

Non Hazardous Waste Type	Total During Previous Financial year	Total During Current Financial year	UOM
Overburden incl. Top Soil	7393568	7605750	M3/Anum

2) From Pollution Control Facilities

Non Hazardous Waste Type	Total During Previous Financial year	Total During Current Financial year	UOM
NA	0	0	CMD

3) Quantity Recycled or Re-utilized within the unit

Waste Type	Total During Previous Financial year	Total During Current Financial year	UOM
0	0	0	CMD

Part-F

Please specify the characteristics(in terms of concentration and quantum) of hazardous as well as solid wastes and indicate disposal practice adopted for both these categories of wastes.

1) Hazardous Waste

Type of Hazardous Waste Generated	Qty of Hazardous Waste	UOM	Concentration of Hazardous Waste
5.1 Used or spent oil	56.266	KL/A	Auhorised recycler
5.2 Wastes or residues containing oil	1	Ton/Y	CHWTSDF BUTIBORI
2.2 Sludge containing oil	4	Ton/Y	CHWTSDF BUTIBORI

2) Solid Waste

Type of Solid Waste Generated	Qty of Solid Waste	UOM	Concentration of Solid Waste
OVERBURDEN incl. TOP SOIL	7605750	M3/Anum	OB Dump, top Soil Dump and Embankment

Part-G

Impact of the pollution Control measures taken on conservation of natural resources and consequently on the cost of production.

Description	Reduction in Water Consumption (M3/day)	Reduction in Fuel & Solvent Consumption (KL/day)	Reduction in Raw Material (Kg)	Reduction in Power Consumption (KWH)	Capital Investment(in Lacs)	Reduction in Maintenance(in Lacs)
Impact of the pollution Control measures	0	0	0	0	10.65	0

Part-H

Additional measures/investment proposal for environmental protection abatement of pollution, prevention of pollution.

[A] Investment made during the period of Environmental Statement

Detail of measures for Environmental Protection	*Environmental Protection Measures*	*Capital Investment (Lacks)*
Pollution control measures	Capital Expenditure	10.65
Pollution control measures, Statutory Fees, Plantation	Revenue Expenditure	252.16

[B] Investment Proposed for next Year

Detail of measures for Environmental Protection	*Environmental Protection Measures*	*Capital Investment (Lacks)*
Capital Investment	Mist cannon, sweeping machine etc	80

Part-I

Any other particulars for improving the quality of the environment.

Particulars

Environment protection and abatement of pollution

Name & Designation

R.ARUMUGAM, Dy.G.M. (Min)/ Sub Area Manager

UAN No:

MPCB-ENVIRONMENT_STATEMENT-0000056782

Submitted On:

05-09-2023