WESTERN COALFIELDS LIMITED
OFFICE OF THE SUB AREA MANAGER
SASTI SUB AREA, BALLARPUR AREA

Ref No. WCL/BA/AGM/ENV/ 1498 Date: 25/11/2025

To
Addl. Principal Chief Conservator of Forests,
Ministry of Environment, Forest & Climate Change
Integrated Regional Office, Ground Floor,
East Wing, "New Secretariat Building", Civil Lines,
Nagpur, Maharashtra- 440001

Sub: - Submission of Six-monthly EC Compliance Report in respect of **SASTI OC MINE,** Ballarpur Area, WCL for the period from 1st April 2025 to 30th September 2025.

Respected Sir,

Please find enclosed herewith the Six-Monthly EC Compliance Report in respect of Sasti Opencast Project, Ballarpur Area for the period from 1st April 2025 to 30th September 2025.
EC NO: J-11015/435/2006-IA.II(M) Dated:- 17.05.2007
EC NO: J-11015/435/2006-IA.II(M) Dated:- 13.09.2023

Thanking you.

Encl. Environment Compliance Report

Yours Faithfully,

Sub Area Manager
Sasti Sub Area

Copy To,
1. **Regional Officer, MPCB Chandrapur.**
2. **AGM, Ballarpur Area , WCL**
3. **The General Manager (Env) WCL, Nagpur**
4. **GM (Environment), CMPDIL RI – IV, Nagpur**
5. **Area Nodal Officer (Env), Wani Area.**
6. **Office Copy**

No.J-11015/435/2006-IA.II(M)
Government of India
Ministry of Environment & Forests

Paryavaran Bhawan,
C.G.O.Complex, Lodi Road,
New Delhi -110003.

Dated: 17th May 2007

To
Head of Department Env./CE(Civil),
Environment Department,
M/s Western Coalfields Ltd.,
Coal Estate, Civil Lines,
NAGPUR – 440001.

Sub: Sasti Expansion Opencast Coal Mine Project (production from 1.60 MTPA to 2.50 MTPA and lease area from 714.09 ha to 919.69 ha) of M/s Western Coalfields Ltd. (WCL), located near village Sasti, Tehsil Rajura, District Chandrapur, Maharashtra - environmental clearance – reg.

Sir,

This has reference to letter No. 43011/145/2006-CPAM dated 29.11.2006 of Ministry of Coal forwarding your application on the above-mentioned subject. The Ministry of Environment & Forests has considered your application. The proposal is for **expansion in production from 1.60 million tonnes per annum (MTPA) to 2.50 MTPA and lease area from 714.09 ha to 919.69 ha.** Of the total lease area, 899.49 ha consist of agricultural land and 20.20 ha is wasteland. No forestland is involved. A township exists at a distance of 5.5 km from mine site. There area no National Parks, Wildlife Sanctuary, Biosphere Reserves found in the 10 km buffer zone. Of the total lease area, area for excavation is 344 ha, 235.30 ha is for OB dumps, 35.52 ha is for infrastructure including CHP, 15 ha is for roads, 24 ha is for railways, 50 ha is for greenbelt, 91 ha is safety zone, 46 ha is area for rationalisation and 78.87 ha is undisturbed (for future excavation). River Wardha flows at a distance of 2.5 km from the ML boundary. Gouri nalalh, a tributary of River Wardha, flows along the 3 sides of the lease boundary. The project involves modification of the natural drainage by strengthening of a seasonal nallah flowing within the ML. Project does not involve R&R. Mining will be opencast by mechanised method. **Expansion of the annual rated capacity of the mine is from 1.60 MTPA to 2.50 MTPA of coal production.** Mineral transportation of **7500 TPD** of coal is by road involving 1500 coal trucks from CHP. Ultimate working depth of the mine is 150 m bgl. Water table is in the range of 0.60 m – 7.40 m bgl in the core zone and upto 13m bgl in the buffer zone. Mining has intersected water table. Peak water requirement is 1050 m3/d, which is to be met from mine pit water. Of the total OB generation, 31.33 Mm3 of OB is already accumulated in five external OB dump of a maxm. of 60m height and of the balance 51.15 Mm3 to be generated, 29.72% would be backfilled. Balance life of the mine at the proposed rated capacity is 18 years. Public Hearing was held on 26.10.2005. NOC has been obtained on 29.05..2006. The project has been approved by M/s WCL on 15.11.2005 at a rated capacity of 2.50 MTPA. Capital cost of the project is **Rs. 83.5149 crores.**

2. The Ministry of Environment & forests hereby accords environmental clearance for the above-mentioned **Sati Expansion Opencast Extension Coal Mine Project** of **M/s WCL for expansion in production of coal at 2.50 MTPA rated capacity involving a total lease area of 919.69 ha** under the provisions of the Environmental Impact Assessment Notification, 2006 and subsequent amendments thereto and under Para 2.1.1 of MOEF Circular dated 13.10.2006 and subject to conditions specified below:

A. **Specific Conditions**

(i) Mining shall be carried out as per statuette at a safe distance from the Gouri nallah/Wardha river flowing close to the lease boundary.

(ii) The embankment to be constructed along the seasonal nallah shall be of suitable dimensions and stabilised with plantation so as to withstand the peak water flow and prevent mine inundation.

(iii) Topsoil shall be stacked properly with proper slope at earmarked site(s) and should not be kept active and shall be used for reclamation and development of green belt.

(iv) OB should be stacked at the earmarked five external OB dumpsite within ML area which shall be a maximum height of 60m only and consist of four benches of 15m each. The ultimate slope of the dump shall not exceed 28°. Monitoring and management of reclaimed dumpsite should continue until the vegetation becomes self-sustaining. Compliance status should be submitted to the Ministry of Environment & Forests and its Regional office located at Bhopal on an yearly basis.

(v) Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected should be utilised for watering the mine area, roads, green belt development, etc. The drains should be regularly desilted and maintained properly.

Garland drains (size, gradient and length) and sump capacity should be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity should also provided adequate retention period to allow proper settling of silt material..

(vi) Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation should be based on the rainfall data.

(vii) Drills should be wet operated only.

(viii) Controlled blasting should be practiced with use of delay detonators. The mitigative measures for control of ground vibrations and to arrest the fly rocks and boulders should be implemented.

(ix) High efficiency bag filters/water sprinkling system to check fugitive emissions from crushing operations, conveyor system, haulage roads, transfer points, etc. shall be installed and operated effectively at all times of operation.

(x) An area not less than 451.65 ha shall be brought under afforestation which includes reclaimed external OB dump (235.30 ha), backfilled area (166.35 ha), along ML boundary, along roads & infrastructure, green belt (50 ha), and area in township located outside the lease by planting native species in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per ha.

(xi) A Progressive Mine Closure Plan shall be implemented by reclamation of quarry area of which 166.35ha shall be backfilled and afforested by planting native plant species in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per ha. The balance 63 ha of decoaled void which is being converted into a water reservoir, shall be gently sloped along the upper benches, terraced and reclaimed with plantation. The outer periphery of the water body shall be fenced.

344 ha

(xii) The company shall obtain prior approval of CGWA/CGWB Regional Office for use of groundwater if any, for mining operations.

(xiii) Besides carrying out regular periodic health check up of their workers, 10% of the workers identified from workforce engaged in active mining operations shall be subjected to health check up for occupational diseases and hearing impairment, if any, through an agency such as NIOH, Ahmedabad within a period of two years and the results reported to this Ministry and to DGMS.

(xiv) A Final Mine Closure Plan along with details of Corpus Fund should be submitted immediately upon receipt of EC to the Ministry of Environment & Forests RO, Bhopal for approval.

(xv) For monitoring land use pattern and for post mining land use, a time series of landuse maps, based on satellite imagery (on a scale of 1: 5000) of the core zone and buffer zone, from the start of the project until end of mine life shall be prepared once in 3 years (for any one particular season which is consistent in the time series), and the report submitted to MOEF and its Regional office at Bhopal.

(xvi) Consent to Operate shall be obtained before expanding mining operations in the additional lease area and for the enhanced rated capacity after fulfilling the conditions imposed in the NOC.

B. General Conditions

(i) No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment and Forests.

(ii) No change in the calendar plan including excavation, quantum of mineral coal and waste should be made.

(iii) Four ambient air quality monitoring stations should be established in the core zone as well as in the buffer zone for SPM, RPM, SO2 and NOx monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board.

(iv) Fugitive dust emissions (SPM and RPM) from all the sources should be controlled regularly monitored and data recorded properly. Water spraying arrangement on haul roads, wagon loading, dump trucks (loading and unloading) points should be provided and properly maintained.

(v) Data on ambient air quality (SPM, RPM, SO2 and NOx) should be regularly submitted to the Ministry including its Regional Office at Bhopal and to the State Pollution Control Board and the Central Pollution Control Board once in six months.

(vi) Adequate measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc should be provided with ear plugs/muffs.

(vii) Industrial wastewater (workshop and wastewater from the mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May 1993 and 31st December 1993 or as amended from time to time before discharge. Oil and grease trap should be installed before discharge of workshop effluents.

(viii) Vehicular emissions should be kept under control and regularly monitored. Vehicles used for transporting the mineral should be covered with tarpaulins and optimally loaded.

(ix) Environmental laboratory should be established with adequate number and type of pollution monitoring and analysis equipment in consultation with the State Pollution Control Board.

(x) Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects.

Occupational health surveillance programme of the workers should be undertaken periodically to observe any contractions due to exposure to dust and to take corrective measures, if needed.

(xi) A separate environmental management cell with suitable qualified personnel should be set up under the control of a Senior Executive, who will report directly to the Head of the company.

(xii) The funds earmarked for environmental protection measures should e kept in separate account and should not be diverted for other purpose. Year-wise expenditure should be reported to this Ministry and its Regional Office at Bhopal.

(xiii) The Regional Office of this Ministry located at Bhopal shall monitor compliance of the stipulated conditions. The Project authorities shall extend full cooperation to the office(s) of the Regional Office by furnishing the requisite data/ information/monitoring reports.

(xiv) A copy of the will be marked to concerned Panchayat/ local NGO, if any, from whom any suggestion/representation has been received while processing the proposal.

(xv) State Pollution Control Board should display a copy of the clearance letter at the Regional Office, District Industry Centre and Collector's Office/Tehsildar's Office for 30 days.

(xvi) The Project authorities should advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular language of the locality concerned within seven days of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution control Board and may also be seen at the website of the ministry of Environment & Forests at http://envfor.nic.in.

3. The Ministry or any other competent authority may stipulate any further condition for environmental protection.

4. Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract the provisions of the Environment (Protection) Act, 1986.

5. The above conditions will be enforced *inter-alia*, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and Rules.

(Dr.T.Chandini)
Director

Copy to:

1. Secretary, Ministry of Coal, New Delhi.
2. Secretary, Department of Environment, Government of Maharashtra, 15th Floor, New Admn. Bldg., Madam Cama Road, MUMBAI – 400032..

सत्यमेव जयते

File No.: J-11015/435/2006-IA.II(M)
Government of India
Ministry of Environment, Forest and Climate Change
IA Division
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Dated **13/09/2023**

To,

Kaushik Chakraborty
Western Coalfields Limited
Coal Estate Civil lines, Nagpur-440001 Coal Estate Civil lines, Nagpur-440001, NAGPUR, MAHARASHTRA, Civil Lines, Nagpur, 440001
wclenv07@gmail.com

Subject: **Expansion of Sasti OCP for increase in ML area from 919.69 ha to 1120.48 ha with production capacity of 2.50 MTPA by M/s Western Coalfields Limited located in Village Sasti & Mathra, Tehsil Rajura, District Chandrapur (Maharashtra) – For Environmental Clearance - reg.**

Sir/Madam,

This is in reference to your application submitted to MoEF&CC vide proposal number IA/MH/CMIN/435209/2023 dated 01/07/2023 for grant of prior Environmental Clearance (EC) to the project under the provision of the EIA Notification 2006-and as amended thereof.

2. The particulars of the proposal are as below :

(i) EC Identification No.	EC23A0101MH5120135N
(ii) File No.	J-11015/435/2006-IA.II(M)
(iii) Clearance Type	Fresh EC
(iv) Category	A
(v) Project/Activity Included Schedule No.	1(a) Mining of minerals
(vi) Sector	Coal Mining
(vii) Name of Project	Sasti Expansion OCP for increase in ML area from 919.69 ha to 1120.48 ha keeping the existing production capacity of 2.50 MTPA located in Sasti & Mathra village, teh Rajura, Dist Chandrapur, Maharashtra
(ix) Location of Project (District, State)	CHANDRAPUR, MAHARASHTRA
(x) Issuing Authority	MoEF&CC
(xii) Applicability of General Conditions	No

2. The Ministry of Environment, Forest and Climate Change has considered the application. It is noted that

the proposal is for grant of Environmental Clearance to Expansion of Sasti OCP for increase in ML area from 919.69 ha to 1120.48 ha with production capacity of 2.50 MTPA by M/s Western Coalfields Limited located in Village Sasti & Mathra, Tehsil Rajura, District Chandrapur (Maharashtra).
The project/activity is covered under category 'A' of item1 (a) 'Mining of Minerals' the Schedule to the EIA Notification, 2006

3. The proposal was considered by the sectoral Expert Appraisal Committee (EAC) in its 47th EAC meeting held on 21 to 22 July, 2023 through Video Conferencing The details of the proposal, as ascertained from the proposal documents and as revealed from the discussions held during the meetings, are given as under:

1. The project area is covered under Survey of India Topo Sheet No 56 M/5 and is bounded by the latitudes from N 19^0 47' 18.24" to 19^0 49' 59.41" and longitudes E 79^0 17' 50.89" to 79^0 20' 1.17".
2. Coal linkage of the project is proposed for thermal use for MAHAGENCO & miscellaneous consumers.
3. There is no Joint venture.
4. Project does not fall in the Critically Polluted Area (CPA), where the MoEF&CC's vide its OM dated 13 January 2010 has imposed moratorium on grant of environment clearance.
5. Employment generation, Permanent employment to 710 persons will be provided from the project. In addition, approximately 200 Nos. of employment shall be provided by contractual HEMM operators.
6. The project is reported to be beneficial to bridge the gap (to the extent of the peak production capacity of the project) between demand & supply of non – coking coal for power plants & other consumers from Western as well as Southern part of the country. The domestic production of additional coal will reduce the impact of coal and save valuable foreign exchange. The CSR activities will provide development in the nearby villages.
7. The existing Sasti OC mine has been granted environment clearance by MoEF& CC vide ref no. J-11015/435/2006-IA.II (M) Dt. 17.05.2007 for production capacity of 2.50 MTPA within land area of 919.69 ha
8. Earlier, the ToR was issued by MoEF & CC vide its letter no. J-11015/537/2008-IA.II (M) dated: 02.01.2021 pertaining to Expansion of Sasti OC with a production capacity of 2.5MTPA with increase in mine lease area from 919.69 ha to 1120.48 ha. The said proposal is for grant of EC with a production capacity of 2.5MTPA with increase in mine lease area from 919.69 ha to 1120.48 ha.
9. Project has been applied for EC under EIA Notification, 2006.
10. Total mining lease area as per block allotment is 1120.48 ha. The present proposal is for EC with production capacity of 2.5MTPA with increase in land area 919.69 ha to 1120.48 ha. The Mining Plan along with mine closure plan for Sasti OC was approved by competent authority (i.e. WCL Board) for production capacity of 2.5MTPA with increase in mine lease area from 919.69 ha to 1120.48 ha area in its 345th meeting held on 19.09.2022 and communicated vide resolution no. WCL/Office of CS/BM-345/2022-23/499 dated 27.09.2022.
11. Total geological reserve reported in the mine lease area is 117.31 MT with 25.39 MT mineable reserve. Out of total mineable reserve of 25.39 MT, 24.12 MT are available for extraction. Percent of extraction is 95%.
12. One composite seams with thickness ranging from 6.34m to 19.05m are workable. Declared Grade of coal is G9 stripping ratio 1:9.47 m^3/t, while gradient is 1 in 7.4 to 1 in 18.
13. Method of mining operations envisages by opencast with surface miner- an ecofriendly technology.
14. Life of mine is 11 years.
15. The project has 7 external OB dumps in an area of 202.52 ha with 60 m max. height and 46.85 Mm^3 of OB. 1 internal OB in an area of 275.89 ha with 90m height and 171.54 Mm^3 of OB is envisaged in the project.
16. Total quarry area is 544.79 ha out of which backfilling will be done in 275.89 ha while final mine void will

be created in an area of 268.90 ha with a depth of 200 m. Backfilled quarry area of shall be reclaimed with plantation after completion of entire mining operation. Total plantation at post mining would be 686.41 ha. Final mine void will be converted to water body.

17. Transportation of coal has been proposed by dumpers in mine pithead, from surface to siding by trucks and at sidings by railways. Proposed change in transportation means are as follows: New railway siding will be constructed within existing ML area. About 2.5 km of new railway track will be required to lay upto new siding from main line. Trucks will dump coal on the elevated platform to create stock along the railway siding. Coal from the stock will be loaded into railway wagons with the help of pay loaders/front end loaders.

18. It was noted that in the interim period till construction of railway siding within ML area of Sasti OC, a railway siding at Gauri Deep OC (Distance – 6.2 kms) is proposed to be constructed. This railway siding is likely to be operationalized by August, 2023. It is proposed to install wind barrier system and rain guns for pollution control mitigation measures at Gauri Deep Railway siding with capital of 282.0 Lakhs. New railway siding will be constructed in western side of the proposed quarry beyond fault F8-F8 within existing ML area. The New Railway Siding within ML area of Sasti OC will be operationalized by March, 2026

19. Reclamation Plan in an area of 686.41 ha, comprising of 202.52 ha of external dump, and 275.89ha in internal dump. In addition to this, an area of 36 ha, included in the undisturbed area/ built up area/ township/embankment area, and also172.0 ha has been proposed for green belt development. Plantation on External dump will be carried out when the dump reaches the stipulated height as per Mining Plan and physical reclamation is completed.

20. There is no forestland has been reported to be involved in the project.

21. No National Parks, Wildlife Sanctuaries and Eco-Sensitive Zones fall within 10 km boundary of the project.

22. There are Four Schedule-I species recorded in the study area namely Tiger, Sloth Bear, Leopard and wild dog. The conservation plan with capital outlay of 1.59 Crore is proposed on conservation measures.

23. The ground water level (m) varying in core and buffer zone : Pre-Monsoon : Core zone: 6.60m to 8.60 m; Buffer zone : 2.32 to 12.50 m; Post-Monsoon : Core zone : 3.90m to 6.48m; Buffer zone : 0.98 m to 9.83 m

24. Total water requirement for industrial purposes is 620 KLD and 474 KLD for residential requirement.

25. The project has been granted NOC for ground water abstraction by CGWA vide NOC no CGWA/NOC/MIN/ORIG/2021/12462 dated 03.08.2021 and valid upto 02.08.2023.

26. In compliance with the ToR condition 40 regarding Public Hearing: Date and Venue of Public Hearing: Public Hearing has been successfully conducted on 16.03.2023 by Maharashtra Pollution Control Board at at Manoranjan Kendra, WCL, Sasti Colony, Village Dhoptala, Tehsil – Rajura, District Chandrapur, Maharashtra.

27. Major issues raised in the public hearing include Employment, CSR, land acquisition, Environment Pollution etc.

28. A total provision of Rs.113.33 lakhs has been envisaged in the capital expenditure for compliance of issue raised during Public Hearing etc and will be implemented as per the assurances given by PP during Public hearing.

29. Consent to Operate for the existing capacity of 2.5 MTPA was obtained from the State PCB on 27.02.2023 valid upto 31.12.2023.

30. Gauri Nallah and Sasti (Shivnal) Nallah flows through the project area and Sakhari nallah flows along the mine boundary of the project. In the coal conservation point of view, 2.60 km and 2.70 km diversion of Gauri nallah and Sasti (Shivnal) nalla is proposed in the proposal respectively. There is also proposal for widening of sakhari nallah for 1.50 km.

31. Baseline Data monitoring has been carried out from 1 October to 31 December 2020. 12 nos. of sampling

location monitored during the Baseline Study. All the parameters have been found to be within the permissible limits. Regular monitoring of ambient air quality is being carried out on fortnightly basis. The documented report is submitted to MPCB and also to MoEF&CC along with half yearly EC compliance report.

32. No court cases, violation cases are pending against the project of the PP.

33. The project does not involve violation of the EIA Notification, 2006 and amendment issued thereunder. The coal production from the mine was started from the year 1985-86 onwards. Excess production from the mine was realized from 1994-95 to 2004-05 w.r.t. the EC granted on 3rd April, 1989 for production capacity of 1.0 MTPA. Subsequently, the application under post facto clearance for expansion in production capacity from 1.00 MTPA to 1.60 MTPA was submitted to MoEF&CC in 2004. The Environment clearance was issued on 19th May 2005 for production capacity of 1.60 MTPA after deliberation in EAC meetings. No excess production of coal from the sanctioned capacity has been realized since grant of EC in 2005-06. The project was subsequently submitted again for expansion in production capacity from 1.60 MTPA to 2.50 MTPA and EC for expansion capacity was granted on 17 May 2007.

34. Project does not involve resettlement of the any villages.

35. Total cost of the project is Rs. 37159.29 Lakhs. Cost of production is Rs.1544.06 per tonne., CSR cost is Rs. 2 per tonne, and no R&R cost as no village rehabilitation is proposed. Environment Management Cost - Capital Rs.1250.06 Lakh & Recurring cost is 6/tonne of coal production

36. Consent to Operate for the existing capacity of 2.5 MTPA was obtained from the State PCB on 27.02.2023 valid upto 31.12.2023.

37. The additional details of project is produced at Annexure-2 & Annexure-3.

4. The Expert Appraisal Committee in its 47th EAC meeting held during 21-22 July, 2023 through Video Conferencing has recommended the project for grant of Environment Clearance (EC). Based on recommendations of the EAC, Ministry of Environment, Forest and Climate Change hereby accords approval for Environment Clearance(EC) to **Expansion of Sasti OCP for increase in ML area from 919.69 ha to 1120.48 ha with production capacity of 2.50 MTPA by M/s Western Coalfields Limited located in Village Sasti & Mathra, Tehsil Rajura, District Chandrapur (Maharashtra),** under the provisions of the Environment Impact Assessment Notification, 2006 and subsequent amendments/circulars thereto subject to the compliance of the terms & conditions / specific conditions at Annexure-I in addition to the standard environmental conditions notified by the Ministry.

5. This issue with an approval of the Competent Authority.

Copy To

1. The Secretary, Ministry of Coal, Shastri Bhawan, New Delhi
2. The Principal Secretary, Department of Environment, Government of Maharashtra, 15th Floor, New Admn. Bldg, Madam Cama Road, Mantralaya, Mumbai - 32 (Maharashtra)
3. The Chairman, Maharashtra State Pollution Control Board, Kalapataru Point, 3rd & 4thFloors, Sion, Matunga Scheme Road No. 8, Opp. Cine Planet Cinema, Near Sion Circle, Sion (E), Mumbai - 2
4. The District Collector, **Chandrapur.** Government of **(Maharashtra)**
5. Deputy Director General of Forests (C), Ministry of Env., Forest and Climate Change, Integrated Regional Office, Ground Floor, East Wing, New Secretariat Building, Civil Lines, Nagpur- 440001 (Maharashtra)
6. The Chairman, Central Ground Water Authority, Ministry of Jal Shakti, Jamnagar House, 18/11, Man Singh Road Area, New Delhi, Delhi 110001

7. Monitoring File 8. PARIVESH

Annexure 1

Specific EC Conditions for (Mining of minerals)

1. Additional specific Condition

S. No	EC Conditions
1.1	PP shall conduct comprehensive hydraulic and drainage study of catchment area to assess the impact on the wardha river within a year and submit the report to IRO.
1.2	PP shall submit the proof of submission of Wildlife Conservation Plan for schedule I species to IRO and further deposit the allocated amount within six months.
1.3	PP shall carry out the mining activity at a safe distance of 100m from Gauri Nallah/ Wardha River flowing through mine lease area or adjacent to the lease area. In any circumstances, PP shall not divert any streams flowing within/adjacent to the mine lease area till no comprehensive study as stated above is done.
1.4	PP needs to extract the seepage ground water from the mine and treat it through ETP so that the water can be further utilize in the Mine as well for the local villagers.
1.5	PP shall implement dedicated inpit conveyor belt with silo loading system till railway siding on or before December, 2025. Accordingly, SPCB may grant CTO to strictly comply this condition.
1.6	The truck size of 40 tonne (payload) for the transportation of coal shall be deployed through dedicated road till commissioning of SILO with rapid loading system on or before December, 2025 accordingly SPCB may issue the CTO.
1.7	PP has to resolve suggestions/objections raised during the public hearing along with implement activities-wise proposed budget of Rs. 113.33 Lakhs (as Public Hearing Budget), Rs. 1250 Lakhs (as EMP cost) in time bound manner as per s.no. (xvi) & (xvii) of para 47.1.3 of MoM of the EAC meeting. The details of annual expenditure shall be part of report submitted to IRO, MoEF&CC. PP needs to include the audited figures against the expenditure and activities to be monitored by through dedicated online monitoring mechanism. The maintenance of all activities shall be covered through recurring cost of Public Hearing, which will be part of CSR budget.
1.8	PP has to implement capital budget upto Rs. 1341.37 lakh for implementing additional air pollution control measures, Rs. 125 lakhs for mitigation of water pollution in time bound manner as per s.no. (xiii) & (xix) of para 47.1.3 of MoM. It shall be monitored by IRO, MoEF&CC.
1.9	Install dust barrier (made up of natural fibre) with automatic fixed type sprinkling system across the village area/sensitive area.
1.10	PP shall increase number of fixed type sprinkling system (near to haul road, stockyard, transportation route etc.) across the mine lease area in order to arrest the dust coming out from the mining activities.
1.11	Implement the integrated transportation system with Dhuptala OC mine locating near to the existing

S. No	EC Conditions
	mine owned by M/s Western Coalfields limited.
1.12	PP shall install additional Continuous air quality system at different locations near to village area and share online data with SPCB as well as with CPCB.
1.13	Afforestation activity shall cover area not less than 600 ha, including reclaimed external OB dump, backfilled area, along ML boundary, along roads & infrastructure, township area. The density of the trees should be around 2500 plants per ha.
1.14	PP shall conduct special drive for villages such as Sasti, Gauri, Pauni and other nearby villages for air pollution mitigation measures and no coal storage yard, OB dump shall be dumped near to the villages.
1.15	Water storage ponds shall be constructed of appropriate depth in nearby village in collaboration with Gram Panchayat
1.16	PP shall increase the bed capacity of the existing Hospital from 25 to 50 bedded at Sasti Township and allow local villager to avail the hospital facility. Quarterly health check- up campaign shall be conducted in all the villages located in 10 km buffer area.
1.17	PP shall construct 25-sitter digital library in each village including the daily newspaper facility.
1.18	PP shall create a "**Public Grievance Redressal and Monitoring System**" for resolving any issues related to the pollution of mines and complaint has to resolve as soon as possible not beyond 30 days. In this regard, adequate awareness to be spread among the public to address their grievance to company with simple and easy manner and for which company needs to devise the mechanism. The same shall be reported to IRO within 3 months. A logbook to be maintained by PP on "**Public Grievance Redressal and Monitoring System**."
1.19	PP shall conduct third party audit of compliance of EC condition at an interval six months and its report shall be submitted to IRO, MoEF&CC.
1.20	The status of mine closure activities must be included in every six months compliance report submitted to the state pollution control board and IRO.
1.21	PP to maintain the topped haul road properly to minimized the dust emission. PP to also develop pucca roads by seeking consent from the panchayat with widening of roads especially roads inter linking the villages within the study area of 10 km radius buffer zone.
1.22	PP to install solar lights along the road used for transportation of minerals to avoid the accidents at night and also seek its maintenance. PP is asked to also identify the rural areas for installation of solar light with its maintenance within the study area of 10 km radius buffer zone within one year.
1.23	PP to provide bio toilets to the villages located within the study areas within 1 year from the grant of this EC.
1.24	PP shall conduct feasibility studies for assessment of voids for backfilling of ash and mixing of ash with overburden, taking up backfilling ash and OB mixing activities during operations as well as post closure of mines in line with the Fly Ash Utilization Notification, 2021

S. No	EC Conditions
1.25	PP shall pay to farmers of agricultural land if there is any loss due to pollution found by concerned District Commissioner as per extent rules or norms
1.26	PP shall deploy atleast 20% of overall fleet of dumpers/trucks/other vehicles as electrical or CNG/LNG based for transportation of coal/OB etc.

Annexure 2

Details of the Project

<table>
<tr><th>S. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>a.</td><td>Details of the Project</td><td>Sasti Expansion OCP for increase in ML area from 919.69 ha to 1120.48 ha keeping the existing production capacity of 2.50 MTPA located in Sasti & Mathra village, teh Rajura, Dist Chandrapur, Maharashtra</td></tr>
<tr><td>b.</td><td>Latitude and Longitude of the project site</td><td>19.788672850469, 79.2977166466971 19.8330341537081, 79.3335429628642</td></tr>
<tr><td>c.</td><td>Land Requirement (in Ha) of the project or activity</td><td><table><tr><th>Nature of Land involved</th><th>Area in Ha</th></tr><tr><td>Non-Forest Land (A)</td><td>1120.48</td></tr><tr><td>Forest Land (B)</td><td>Nil</td></tr><tr><td>Total Land (A+B)</td><td>1120.48</td></tr></table></td></tr>
<tr><td>d.</td><td>Date of Public Consultation</td><td>Public consultation for the project was held on 2023-03-16</td></tr>
<tr><td>e.</td><td>Rehabilitation and Resettlement (R&R) involvement</td><td>NO</td></tr>
<tr><td>f.</td><td>Project Cost</td><td>37159.29</td></tr>
<tr><td>g.</td><td>EMP Cost</td><td>1250.6</td></tr>
<tr><td>h.</td><td>Employment Details</td><td>710</td></tr>
</table>

Annexure

The land usage pattern of the project is as follows:

Pre-Mining

Sl. No.	Type of Land	Area (in Ha)
1	Tenancy land	1085.98
2	Forest land	0.00
3	Govt. land	34.50
	Total	**1120.48**

Post Mining

Sl. No.	Land use during mining	Land use (ha)				
		Plantation	Water Body	Public use	Undisturbed	Total
1	External OB Dump	149.54	-	-	-	149.54
2	Top Soil Dump	52.98	-	-	-	52.98
3	Excavation	275.89	268.90	-	-	544.79
4	Roads	5.00	-	15.00	-	20.00
5	Built up area (Infrastructure)	20.00	-	39.52	-	59.52
6	Undisturbed Area	172.00	-	-	67.25	239.25
7	Embankment around quarry	10.00	-	27.80	-	37.80
8	Outside ML Area	1.00	-	15.60	-	16.60
	Total	**686.41**	**268.90**	**97.92**	**67.25**	**1120.48**

Revised budget of Rs. 1341.37 Lakh for implementing the additional mitigation measures such as:

Particular/Location	Existing Mitigation Measures	Mitigation Measures proposed and presented in 47 EAC	Capital Provision made (in Lakhs)	Modification in Mitigation Measures as directed in 47 EAC	Modified Capital Provision made (in Lakhs)
Mobile Water Sprinklers along Haul road, Coal stockyard, Weigh bridge, Coal transportation road	Presently 05 Nos. of Mobile Water Tankers are provided for dust suppression	Provision for 2 Nos of 28 KL Mobile Water Sprinklers is made (Replacement) Hiring of mobile water sprinklers will be continued in future also.	408.26	a) 3 Nos- 28 KL: In the mine for controlling dust in and around the project. b) 2 Nos- 16 KL : From Sasti mine to Mathra village turning (i.e 3 km road patch of coal transportation route)	608.26
Fixed Water Sprinklers along Haul road, Coal stockyard, Weigh bridge, Coal transportation road	35 Nos of Fixed Sprinklers Provided	Provision made for Additional Fixed Sprinklers and Fogging Machine	80.00	Provision made for Additional Fixed Sprinklers a) covering remaining 3 kms of coal transporta2on route from mine to Gouri deep siding – 75 nos with 15 meters of throw b) Covering coal stock yard of Sasti Expansion OCM with 20	150

				sprinklers c) Installation of Rain guns at Gauri Deep railway siding - 16 nos.	
Road Sweeping Machine	To be provided	It is proposed to introduce road sweeping machine for removal of dust from coal transportation route	43.11	a) 1 no proposed for Sasti Expansion OC Project.	43.11
				b) Additional 4 nos in neighboring mines. One no. bromming machine in Gauri deep, Pauni II, Gauri Pauni, Ballarpur OC	80.00
Fogging Machine	To be provided	For suppression of dust, fogging machine is proposed in the mine	60.00	7 no's of trolley mounted fogger with 100 m throw.	70.00
Greenbelt	Area not less than 500 ha and around 2500 plants per ha	The greenbelt in the dip side along the area of expansion will be developed.	70.00	Covering 6 kms of coal transportation route from mine to Gouri deep siding – approx. 5000 no's bamboo plantation and also inside mine lease area along the embankment, OB dumps etc	70.00

Continuous Ambient Air Quality Monitoring Station	1 nos of CAAQMS has been installed in nearby mine Pauni-II Expansion OC.	1 nos of CAAQMS is proposed to installed for Sas2 Expansion OC Mine.	75.00	1 no of CAAQMS is proposed to be installed for Sasti Expansion OC Mine.	75.00
Dust Barrier				Dust Barrier along the coal transportation road to protect Goyegaon village of 12 feet height for 750 m patch on initial basis.	75.00
				Wind barrier is under final stage of completion of height aprox. 18 feet. Along the railway track (1km length) to control dust pollution.	170.00
Total Capital Provision made in Project Report			**736.37**		**1341.37**

Rs. 125 Lakhs has been proposed for mitigation of water pollution are as follows:

Particular	**Existing Control Measure**	**Proposed Control Measure**	**Capital provision made in approved Expansion Project Report (in Lakhs)**
Workshop Effluent waste-water	A ETP of 150 KL is in operations at existing Sasti OC.	Capital provision of 25.0 Lakhs has been made for repair/upgradation of ETP in the approved Project Report.	25.00
Mine Water	A sedimentation	Capital provision of 25.00	25.00

	tank is in operation in existing Sasti OC.	Lakhs has been made for the additional sedimentation tank.	
Sewage Treatment Plant	1 MLD Sewage Treatment Plan is in operation at Sasti Township.	Provision of 75 Lakhs has been made for repair/upgradation of existing 1 MLD STP.	75.00
Total Capital Provision Made (Additional)			**125.00**

Rs. 1250 Lakhs proposed w.r.t. Environmental Management as follows:

Sl. No.	Particulars	Amount (Rs. Lakhs)	Timeline
1	Sedimentation Pond upgradation for Treatment of Mine Waste water	25	2023-24
2	Effluent Treatment Plant upgradation for treatment of Workshop Effluent	25	2023-24
3	Base Line Environment Data Generation	15	Generated
4	Fogging machines for Dust control measures.	60	2023-24
5	Digital Mapping for Land Use Plan	15	Completed
6	Continuous Ambient Air Quality Monitoring Station (CAAQMS)	75	2023-24
7	Sewarage Treatment Plant	75	2024-25
8	Installation of fixed type sprinklers on haul roads, transportation of coal route, CHP loading & unloading points and other dust generation sources etc.	80	2022-24
9	10-30m of three tier plantations for green belt along mine boundary for approx 14.00 km to control air pollution	70	2022-25
10	Health check-up for Occupational diseases as per EC Condition	30	Continued
11	Scientific Studies	15	2023-24
12	Installation of Piezometers with telemetry	25	2022-23
13	Fund for Wild Life Conservation	100	2023-24
14	Provision for Compliance of issue raised during Public Hearing etc	100	2022-25

15	Misc. Provisions for fulfillment of statutory requirements under environment clearance, CTE, CTO, ground water clearance or as per directives of SPCB/MoEF&CC.	67.51	2022-26
Appendix – A.3.1 of Project Report			
16	2 nos of 28 KL Mobile Water Sprinklers with mist spray (Replacement)	408.26	2024-25
17	Road Sweeping Machine	43.11	2023-24
Appendix – A.3.2 of Project Report			
18	Energy Conservation	21.18	Continued
	Total	**1250.06**	

Budget of Rs.113.33 lakhs proposed as capital expenditure for compliance of issue raised during Public Hearing and their action plan has been mentioned below:

Sl. No.	**Particulars**	**Location (Name of School /Village/Area)**	**FY 2022-23 (In Lakhs)**	**FY 2023-24 (In Lakhs)**
1	Infrastructure creation for Drinking Water supply	Goyegaon		3
		Rampur	5.32	
		Mathra	5.99	
		Dhidsi	5.99	
2	Sanitation	Ballarpur Area	1.5	
		Nearby Villages		6
3	Education	Manoli	0.58	
		Chincholi		7
		Gauri		5
		Chunala		30
4	Skill Development	Ballarpur Area		
12	Avenue plantation			2
14	Infrastructure	Chincholi		
		Mathra		20
		Gouri	0.68	
15	Health	Balarpur area	2	
		Sasti	0.17	5
		Sakhari		
		Mathra		4
		Gauri		4
		Nearby Villages		2
16	Art, Culture & Sports	Ballarpur Area	3	
	Total		**25.23**	**88**

The grant of Environmental Clearance is further subject to compliance of the Standard EC conditions as under:

(a) Statutory compliance

(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.
(ii) The project proponent shall obtain clearance from the National Board for Wildlife, if applicable.
(iii) The project proponent shall prepare a Site-Specific Conservation Plan / Wildlife Management Plan and approved by the Chief Wildlife Warden. The recommendations 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-I 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.
(v) The project proponent shall obtain the necessary permission from the Central Ground Water Authority.

(vi) Solid/hazardous waste generated in the mines needs to addressed in accordance to the Solid Waste Management Rules, 2016/Hazardous & Other Waste Management Rules, 2016.

(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 PM_{10}, $PM_{2.5}$, SO_2 and NO_x. 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.

(ii) 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.

(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 PM_{10}/$PM_{2.5}$) 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.

(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 a 'bypass' road, it should be so 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.

(vi) Coal stock pile/crusher/feeder and breaker material transfer points shall invariably be provided with dust suppression system. Belt-conveyors 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.

(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.

(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.

(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-lA.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.

(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 and 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.

(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.

(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.

(vi) Catch and/or garland drains and siltation ponds in adequate numbers and appropriate size shall be constructed around the mine working, 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 be 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.

(vii) Adequate groundwater recharge measures shall be taken up for augmentation of ground water. The project authorities shall meet water requirement of nearby village(s) after due treatment conforming to the specific requirement (standards).

(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.

(ix) The water pumped out from the mine, after siltation, shall be utilized 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.

(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/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.

(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 rivarine/riparian ecosystem conservation and management plan should be prepared and implemented in consultation with the irrigation / water resource department in the state government.

(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.

(ii) Controlled blasting techniques shall be practiced in order to mitigate ground vibrations, fly rocks, noise and air blast etc., as per the guidelines prescribed by the DGMS.

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

(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.

(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).

(iii) No mining shall be carried out in forest land without obtaining Forestry Clearance as per Forest (Conservation) Act, 1980.

(iv) Efforts should be made to reduce energy and fuel consumption by conservation, efficiency improvements and use of renewable energy.

(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 1:50,000 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).

(ii) 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.

(iii) 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-a-vis the post mining land use pattern shall be submitted to the MOEFCC/RO.

(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 MoEF&CC, CPCB and SPCB.

(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 top soil 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.

(vi) The project proponent shall make necessary alternative arrangements, if grazing land is involved in core zone, in consultation with the State government to provide alternate areas for livestock grazing, if any. In this context, the project proponent shall implement the directions of Hon'ble Supreme Court with regard to acquiring grazing land.

(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.

(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 along the major approach/ coal transportation roads.

(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.

(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, 1955 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, if any, as amended time to time.

(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.

(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 Government, as applicable.

(v) The project proponent shall follow the mitigation measures provided in this Ministry's OM No.Z-11013/5712014-IA.I1 (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'.

(i) Corporate Environment Responsibility

(i) 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.

(ii) 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.

(iii) 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 Compliance Report.

(iv) Self environmental audit shall be conducted annually. Every three years third party environmental audit shall be carried out.

(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.

(ii) The copies of the environmental clearance shall be submitted by the project proponents 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.

(iii) The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.

(iv) The project proponent shall monitor the criteria pollutants level namely; PM_{10}, SO_2, 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.

(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.

(vi) The project proponent shall follow the mitigation measures provided in this Ministry's OM No.Z-11013/5712014-IA.I1 (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'.

(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.

(viii) The project authorities shall inform to the Regional Office of the MOEFCC regarding commencement of mining operations.

(ix) The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.

(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.

(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.

(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.

(xiii) The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.

(xiv) The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.

(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.

(xvi) The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, 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 commitments 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.

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.

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.

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 & others.

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.

10. This environmental clearance 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.

11. All other conditions stipulated in the EC vide its letter J-11015/435/2006-IA.II (M) dated 17.05.2007, shall remain unchanged.

Signed by
Lalit Kumar Bokolia
Date: 13-09-2023 12:03:34
Reason: Verified and signed

SASTI EXPANSION OPENCAST COALMINE
MOEF CLEARANCE LETTER No.J-11015/435/2006.IA,II(M) DATED17.05.2007 FOR SASTI EXPANSION OCM FOR A PRODUCTION OF 2.50 MTY.

SN	ENVIRONMENTAL CLEARANCE CONDITIONS	COMPLIANCE
A	Specific Conditions	
(i)	Mining shall be carried out as per statuette at safe distance from the Gouri nallah / Wardha River flowing close To the lease boundary.	Mining activities are restricted within lease hold boundary at a distance of 1.85 km from Gouri Nallah & 2.50 km from Wardha River.
(ii)	The embankment to be constructed along the seasonal nallah shall be of suitable dimensions and stablised with plantation so as to withstand the peak water flow and prevent mine inundation.	Suitable embankment of proper dimension has been constructed to protect the area/ Mine from floodwater as per DGMS norms. Dimensions of embankment are given as below. Length- 3570mtr. Top width & RL-20mtr.,181.5 to 218.5 Bottom width & RL -56 to124mtr, 172.5to 180.00 Height-9.00 mtr to 38.00 mtr. Erstwhile embankment as mentioned above has been realigned since a portion of embankment of about 1000 m has come under excavation area.
(iii)	Topsoil shall be stacked properly with proper slope at earmarked site (s) and should not be kept active and shall be used for reclamation and development of green belt.	Top soil is stacked properly with proper slope at earmarked site Details of dumps are as follows: Dump no:5 Height = 34m Area=21.251Ha Slope=28° Part of the above dump is reclaimed with plantation Dump no: 1 Height = 22 m Area=15.754Ha Slope=28°
(iv)	OB should be stacked at the earmarked five external OB dumpsite within ML area which shall be a maximum height of 60m only and consist of four benches of 15m each. The ultimate slope of the dump shall not exceed 28°, Monitoring and management of Reclaimed dump site should continue until the vegetation becomes self- sustaining. Compliance status	All 5 external O.B. Dumps were stacked at ear marked Dump sites only and 4 out of 5 dumps are afforested. The overall slope of the Dumps is 28°. The afforestation has become so dense that, side slope is not at all visible. The plantation has attained the height of approx 9 to 10 mtrs and the vegetation has become self sustaining.

	should be submitted to the Ministry of Environment & Forest and its Regional office located at Bhopal on an yearly basis.	
(v)	Catch drain sand siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected should be utilized for watering the mine area, roads, greenbelt development etc. The drains should be regularly desilted and maintained properly. Garland drains (size gradient and length) and sump capacity should be designedkeeping50%safetymargin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity should also provided adequate retention period to allow proper settling of silt material.	Settling / sedimentation pond of appropriate size has been constructed to treat the strata seepage water pumped out from mine considering peak discharge. The water so treated is being used within the mine premises for dust suppression, washing of HEMM & for plantation, Industrial use, fire fighting, etc. **Photographs of Settling Tank attached as Annexure 10.** Garland drains of appropriate different sizes of 3.00x2.00, 2.00x1.5, & 1.5.x1.00 mtr for a total length of 12235.00 mtr have been provided along the periphery of excavated area as well as OBD. Desilting is being done every year before on set of monsoon. **Photographs of Garland drains attached as Annexure 11.**
(vi)	Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation should be based on the rainfall data.	The Dumps are also thickly planted on top as well as on slope. The afforestation have become so dense and self sustaining that the side slope is not at all visible. The plants have attained the height of approx, 9 to10 mtrs. In the present operating portion of mine specially benches, such retaining wall is not required. Moreover cross drainage in OB benches have been provided which carry all the silts & sediments ultimately to mine sump provided at the floor of seam. The sump capacity is sufficient enough to allow settlement of suspended matter significantly and only Supernatant water is pumped out on surface. **Photographs of Siltation Pond attached as Annexure – 10 & Photographs of Garland drains attached as Annexure 11.**
(vii)	Drills should be wet operated only.	Drills are fitted with wet drilling arrangement.
(viii)	Controlled blasting should be practiced with use of delay detonators. The mitigative measures for control of ground vibrations and to arrest the fly Rocks and boulders should be implemented.	Controlled blasting is being done as per scientific investigations for design of controlled blasting pattern with SME explosives at Sasti Expansion Opencast mine done by CSIR-Central Institute Of Mining and Fuel Research. **Copy of controlled blasting pattern with SME explosives Study Attached as ANNEXURE 12.**

(ix)	High efficiency bag filters / water sprinkling system to check fugitive emissions from crushing operations, conveyor system, haulage roads, transfer points, etc. shall be installed and operated effectively at al times of operation.	Adequate Fixed type water sprinklers are provided in &around C.H.P. WeighBridges, coal transport roads, transfer points etc. as per direction of M.P.C.B., Chandrapur. These are being properly maintained & operated. Details of Air pollution Control measures are given as below :- 1. Fixed sprinklers are provided at 100 MT weighbridge- 08 Nos. **(Geo Tagged Photos enclosed as Annexure 13)** 2. Fixed sprinklers are provided at Main CHP - 06 Nos. **(Geo Tagged Photos enclosed as Annexure 13)** 3. Fixed sprinklers Along Coal transportation road – 04 nos **(Geo Tagged Photos enclosed as Annexure 13)** 4. Concrete pavement provided at coal loading Area and loading point at mini CHP. 5. Brooming and maintenance of coal transport road and weigh bridge road is done regularly. 6. Spraying of water by 5 Nos. of Mobile Water Tankers (Hired-1 nos. Of 4 KL, Departmental – 2nos. of 28 KL each and HOE contractor – 2 nos. Of 28 KL each) **(Geo Tagged Photos of Mobile Water Sprinklers enclosed as Annexure 14)** 7. Concrete pavement is provided in w/s complex. 8. Coal carrying Trucks are covered with Tarpaulin. 9. Asphalting of 06.00 km length of internal roads used by Coal Transportation trucks. **(Geo Tagged Photos of Ashphalted roads enclosed as Annexure 15)** 10. One no. of trolley mounted fogger has been commissioned at Sasti OC mine with a throw of 100m. **(Geo Tagged Photos of trolley mounted fogger enclosed as Annexure 16)** 11. Further 3 nos. of Fog Cannon are to be commissioned in September 2025. 12. Tyre wash system has been installed & in operation. **(Geo Tagged Photos of Tyre wash system enclosed as Annexure 17)**
(x)	An area not less than 451.65 ha shall be Brought under afforestation which Includes reclaimed external OB dump (235.30ha), backfilled area(166.35ha), Along ML boundary, along roads &	Condition in compliance. Total Plantation of 5.60 lakhs Nos. has been carried out in this project over an area of 187.15 Ha. The Year wise details of plantation is as follow:

	Infrastructure ,greenbelt (50ha) and area in township located outside the Lease by planting native species in consultation with the local DFO / Agriculture Department. The density of the trees should be around 2500 plants Per ha.	

Sr	Year	Plantation (nos.)	Area (Ha)	Species
1	1993-94	47425	9.48	Neem, Gulmohar Amla, Soniya, Maruk, Khair, Kadamba, Bamboo, Ber,etc.
2	1994-95	60000	12.0	
3	1995-96	40000	8.0	
4	1995-96	25000	5.0	
5	1996-97	35000	14	
6	1997-98	22000	8.0	
7	1997-98	37000	14.4	
8	1997-98	2000	0.4	
9	1998-99	66575	26.17	
10	1998-99	34000	13.50	
11	1998-99	2000	0.70	
12	1999-00	34000	13.30	
13	2000-01	30000	12.0	
14	2002-03	18750	7.50	
15	2002-03	22250	8.90	
16	2007-08	25000	10.0	
17	2009-10	2000	0.80	
18	2013-14	12500	5.00	
19	2024-25	25000	10.0	
20	2025-26	20000	08.00	
	TOTAL	560500	187.15	

The Map Showing the Plantation is enclosed as Annexure - 18 & The Geotagged photos of Plantation is enclosed as Annexure - 19

(xi)	A Progressive Mine Closure Plan shall be implemented by reclamation of Quarry area of which 166.35 Ha shall be Backfilled and afforested by planting Native plant species in consultation with the local DFO / Agriculture Department. The density of the trees should be around 2500 plants per ha. The balance 63 ha of decoaled void which is being converted into a water reservoir, shall be gently sloped along the upper benches, terraced and reclaimed with plantation. The outer periphery of the water body shall be fenced.	Condition in compliance. Total Plantation of 5.60 lakhs Nos. has been carried out in this project over an area of 187.15 Ha. The Year wise details of plantation is as follow:

Sr	Year	Plantation (nos.)	Area (Ha)	Species
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4	1995-96	25000	5.0	
5	1996-97	35000	14	
6	1997-98	22000	8.0	
7	1997-98	37000	14.4	

		8	1997-98	2000	0.4	Kadamba, Bamboo, Ber,etc.
		9	1998-99	66575	26.17	
		10	1998-99	34000	13.50	
		11	1998-99	2000	0.70	
		12	1999-00	34000	13.30	
		13	2000-01	30000	12.0	
		14	2002-03	18750	7.50	
		15	2002-03	22250	8.90	
		16	2007-08	25000	10.0	
		17	2009-10	2000	0.80	
		18	2013-14	12500	5.00	
		19	2024-25	25000	10.0	
		20	2025-26	20000	08.00	
			TOTAL	560500	187.15	
		The Map Showing the Plantation is enclosed as Annexure - 18 & The Geotagged photos of Plantation is enclosed as Annexure – 19 Further, As per the latest Mine Closure guidelines of MoC, A Final Mine Closure Plan will be prepared within 5 years of Closure of Mine & the same will be implemented.				
(xii)	The company shall obtain prior approval of CGWA/CGWB Regional Officer for use of ground water if any, for mining operations.	CGWA NOC obtained vide CGWA/ NOC / MIN / ORIG / 2021 / 12462 valid upto 02/08/2025. **Copy of CGWA NOC Attached as Annexure 20.** Further, an application for renewal of NOC has also submitted to CGWA. (**The copy of Renewal Application is enclosed as Annexure 21**)				
(xiii)	Besides carrying out regular periodic health check up of their workers, 10% of the workers identified from workforce engaged in active mining operations shall be subjected to health check up for occupational diseases and hearing impairment, if any, through an agency such as NIOH, Ahmadabad within a period of two years and the results reported to this Ministry and to DGMS.	Periodical medical Examinations (P.M.E.) are carried out on compulsorily on each employee once in five years with the purpose of detecting and keeping records of diseases with specific importance to Coal Worker's Pneumoconiosis. This is covered under Statute. During P.M.E., the candidates are subjected to a complete clinical examination, (including acuity of vision and hearing), radiological examination of chest and routine examination of blood and urine. In case some abnormality is detected during the course of the above examination, further investigations are carried out , as required. When a person is diagnosed as having a certain disease, he is referred to the concerned specialist for confirmation and initiation of treatment. IME/PME data for last 5 years is attached as Annexure 9.				

(xiv)	A Final Mine Closure Plan along with details of Corpus Fund should be submitted immediately upon receipt of EC to the Ministry of Environment & Forests RO, Bhopal for approval.	Mine closure guidelines came into force from 27/08/2009, wherein detailed framework for Mine Closure Plan was described. Thereafter MCP for Sasti OC was prepared. As per amended guidelines the competent authority to approve MCP of mines of Govt. Companies will be concerned board of Company. Following the directives of MoC, MCP of Sasti OC was prepared and the same was approved by WCL Board on 25/08/2012. MCP was further revised after EC for Expansion was obtained for increase in ML area. Presently, Rs. _____/- has been deposited in the ESCROW (MCP) account of Sasti Expn. OCM as on 31/03/2025. **Copy of Escrow Account details & MCP attached as a Annexure - 22** In addition to this as per latest Clause no 3.6 of MCP guidelines issued by MoC, the final mine closure plan will be prepared before 5 years from intended Final mine closure. **Copy of MCP guidelines attached as Annexure 23.**
(xv)	For monitoring land use pattern and for post mining land use, a time series of land use maps, based on satellite imagery (on a scale of 1:1500) of the core zone and buffer zone from the start of the project until end of mine life shall be prepared once in 3 years (for any one particular season which is consistent in the time series) and the Report submitted to MOEF and its Regional Officer at Bhopal.	Complied. **The desired report attached as Annexure 24.**
(xvi)	Consent to operate shall be obtained before expanding mining operations in the additional lease area and for the enhanced rated capacity after fulfilling the conditions imposed in the NOC.	CTO has been obtained for capacity 2.50 MTPA valid upto 31.03.2027.
B	**General Conditions**	
(i)	No change in mining technology and scope of working should be made without prior approval of the Ministry Of Environment and Forests& Climate Change.	Condition Complied. No change in mining technology and scope of working has been made.

(ii)	No change in the calendar plan including excavation, quantum of mineral coal and waste should be made.	No change in the calendar plan including excavation, quantum of mineral coal and waste has been made.
(iii)	Four ambient air quality monitoring stations should be established in the core zone as well as in the buffer zone for SPM, RPM, SO2 and NOx monitoring. Location of the stations should be decided basedon the meteorological data, topographical features and environmental and ecologically sensitive targets in consultation with the State Pollution Control Board.	Four ambient air quality monitoring stations are established as below :- 1. BSOA-1–Filter plant at Gouri colony. 2. BSOA-2-Sasti village. 3. BSOA-3–SAM Office. 4. BSOA-4–Area Store. Monitoring of SPM, RPM, SO2 and NOx is being done fortnightly. Environment monitoring reports have been attached as Annexure 26.
(iv)	Fugitive dust emissions (SPM and RPM) from all the sources should be controlled regularly monitored and data recorded properly. Water spraying arrangement on haul roads, wagon loading, dump trucks (loading and unloading) points should be provided and properly maintained.	Adequate Fixed type water sprinklers are provided in &around C.H.P. WeighBridges, coal transport roads, transfer points etc. as per direction of M.P.C.B., Chandrapur. These are being properly maintained & operated. Details of Air pollution Control measures are given as below :- 1. Fixed sprinklers are provided at 100 MT weighbridge- 08 Nos. **(Geo Tagged Photos enclosed as Annexure 13)** 2. Fixed sprinklers are provided at Main CHP - 06 Nos. **(Geo Tagged Photos enclosed as Annexure 13)** 3. Fixed sprinklers Along Coal transportation road – 04 nos **(Geo Tagged Photos enclosed as Annexure 13)** 4. Concrete pavement provided at coal loading Area and loading point at mini CHP. 5. Brooming and maintenance of coal transport road and weigh bridge road is done regularly. 6. Spraying of water by 5 Nos. of Mobile Water Tankers (Hired-1 nos. Of 4 KL, Departmental – 2nos. of 28 KL each and HOE contractor – 2 nos. Of 28 KL each) **(Geo Tagged Photos of Mobile Water Sprinklers enclosed as Annexure 14)** 7. Concrete pavement is provided in w/s complex. 8. Coal carrying Trucks are covered with Tarpaulin. 9. Asphalting of 06.00 km length of internal roads used by Coal Transportation trucks. **(Geo Tagged Photos of Ashphalted roads enclosed as Annexure 15)** 10. One no. of trolley mounted fogger has

		been commissioned at Sasti OC mine with a throw of 100m. **(Geo Tagged Photos of trolley mounted fogger enclosed as Annexure 16)** 11. Further 3 nos. of Fog Cannon are to be commissioned in September 2025. Tyre wash system has been installed & in operation. **(Geo Tagged Photos of Tyre wash system enclosed as Annexure 17)**
(v)	Data on ambient air quality (SPM,RPM,SO2 and NOx) should be regularly submitted to the ministry including its Regional office at Bhopal and to the State Pollution Control Board and the Central Pollution Control board Once in six months.	Ambient Air quality monitoring is being carried out as per GSR 742(E). The monitoring reports on quarterly basis are submitted to MOFF, and MPCB Chandrapur as per directives. Environment Monitoring reports enclosed as **Annexure 26.**
(vi)	Adequate measures should be taken for control of noise levels below 85dBAin the work environment. Workers engaged in blasting and drilling operations, of HEMM etc. should be provided with ear plugs / muffs.	Regular monitoring through CMPDIL is being done on fortnightly basis and the results are within limits, Workers exposed to high noise level are provided with ear plugs/muffs. HEMM are properly maintained and kept in good condition. Noise proof cabins of HEMM are also provided. Sound level meter is used for measuring noise levels at work place and records are maintained.
(vii)	Industrial waste water (workshop and waste water from the mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May 1993 and 31st December 1993 or as amended from time to time before discharge. Oil and grease trap should be installed before discharge of workshop effluents.	Sedimentation/Settling tank is provided in the mine. Mine water is pumped out after proper treatment. The results of mine water are within permissible limit. ETP along with oilskimmer is provided at workshop along with recycling system ETP sludge is properly stacked in the sludge yard as per the directives of MPCB. ETP–150KL/day. The effluent discharge are monitored as per GSR 742(E). **Environment Monitoring reports enclosed as Annexure 26. Geotagged Photos of ETP attached as Annexure 27 and Sedimentation tank attached as Annexure 10.**
(viii)	Vehicular emissions should be kept Under control and regularly monitored. Vehicles used for transporting the mineral should be covered with tarpaulins and optimally loaded.	Vehicular emissions are being monitored Regularly and it is kept under control. Trucks used for transporting of coal are being covered With tarpaulins. In addition to this work order for CHP SILO with Rapid Loading system of capacity 10 MTPA has been awarded and it is expected to be commissioned by June 2027. Above work will completely eliminate the road transportation and substantially reduce the fugitive emission due to vehicle movement. **Copy of CHP SILO work order attached as Annexure 28**

(ix)	Environmental laboratory should be established with adequate number and type of pollution monitoring and analysis equipment in consulta-tion With the State Pollution Control Board.	NABL accredited Laboratory exists at CMPDIL, Nagpur, which monitors all the mines of WCL. In addition to that a state of art continuous Ambient Air Quality Monitoring Station has been installed for monitoring of various parameters like, PM10, PM2.5, Sox, NOx, CO, etc. and other micro meterological parameters. **Photographs of CAAQMS along with report attached as Annexure 29.**
(x)	Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and heath aspects. Occupational health surveillance programme of the workers should be undertaken periodically to observe any contractions due to exposure to dust and to take corrective measures, if needed.	Protective respiratory devices are provided to workmen exposed to dust area. Workers are also regularly given training on safety and health aspects at VTC. (This is the statutory requirements under Mines Safety Act). Periodical Medical Examination of every worker is being done in every five years in our Area Hospital to detect any disease so that appropriate action can be taken up. PME of every person employed in mine is done in interval of five years at area hospital. PPE kit is being distributed on regular basis. PPE include Jackets, Helmets, Earplugs, masks, Gumboots, Safety Shoes, Googles, water bottle etc.
(xi)	A separate environmental management cell with suitable qualified personnel should be set up under the control of a Senior Executive, who will report directly to the Head of the company.	At HQ, WCL- The cell is headed by GM (Env) reporting to Director (Technical). The team comprises of multi-disciplinary trained executive. At Area level –Area General Manager heads the Environment Department assisted by GM (oprn), ANO(Env.), & 2 Deputy Manager (Env.) and 1 Assistant Manager (Env.). At Unit Level- Environment Management Cell is headed by Sub-Area Manager and assisted by Mine Manager, Project Nodal Officer (Env) at Unit level.
(xii)	The funds earmarked for environmental protection measures should e kept in separate account and should not be diverted for other purpose. Year-wise expenditure should be reported to this Ministry and its Regional Office at Bhopal.	The funds earmarked for Environmental protection measures are kept in separate account and it is not used for any other purpose. **Copy of Environment Capital Budget for FY 25-26 attached as Annexure 30**.
(xiii)	The Regional Office of this Ministry located at Bhopal shall monitor Compliance of the stipulated conditions. The Project authorities shall extend full Cooperation to the office(s) of the Regional office by furnishing the Requisite data/ information/ monitoring reports.	Project authorities will extend full Cooperation in all manner to the office(s) of the Regional office by furnishing the Requisite data/ information/ monitoring reports.

(xiv)	A copy of E.C. will be marked to concerned panchayat / local VGP, if any, from who many suggestion/ representation has been received while processing the proposal.	Clearance letter has been sent to concerned Gram Panchayat vide letter No. WCL/BA/SSA/910 dated : 26.06.2007.
(xv)	State Pollution Control Board should display a copy of the clearance letter at the Regional Office, District Industry Centre and Collector's Office / Tehsildar's Office for 30 days.	Condition pertains to State Pollution Control Board.
(xvi)	The Project authorities should advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular language of the locality concerned Within seven days of the clearanceletter informing that the project hasbeen accorded environmental clearance and a copy of the clearance letter is available with the State Pollution control Board and may also be seen at the website of the ministry of Environment & Forests athttp://envfor.nic.in.	Copy Attached as **ANNEXURE 32.**

ECCOMPLIANCEREPORTFORSASTI
EXPANSION OC MINE

FileNo.:J-11015/435/2006-IA.II(M)
DATED:13.09.2023

Sr no.	CONDITIONS	COMPLIANCE STATUS
	ADDITIONAL SPECIFIC CONDITIONS	
1	PP shall conduct comprehensive hydraulic and drainage study of catchment area to assess the impact on the wardha river within a year and submit the report to IRO.	Comprehensive hydraulic and drainage study of catchment area to assess the impact on the wardha river has been done by IIT, Kharagpur. Copy of report attached as Annexure 33.
2	PP shall submit the proof of submission of Wildlife Conservation Plan for schedule I species to IRO and further deposit the allocated amount within six months.	Wildlife Conservation Plan for schedule I species have been submitted to DCF office for approval along with fund allocation. Copy of covering letter along with Conservation plan attached as Annexure 34.
3	PP shall carry out the mining activity at a safe distance of 100m from Gauri Nallah / Wardha River flowing through mine lease area or adjacent to the lease area. In any circumstances, PP shall not divert any streams flowing within/adjacent to the mine lease area till no comprehensive study as stated above is done.	Mining activities are restricted within lease hold boundary at a distance of 1.85 km from Gouri Nallah & 2.50 km from Wardha River. No nallah or River diversion shall be made without carrying out studied and approvals from competent authorities of State Government.
4	PP needs to extract the seepage ground water from the mine and treat it through ETP so that the water can be further utilize in the Mine as well for the local villagers.	Strata seepage water is being treated through sedimentation tank of capacity 1000 m^3 and maximum amount of water has been used for inhouse purposes like domestic use, green belt development, dust suppression purposes and remaining portion of the strata seepage water has been discharged into local nallah.
5	PP shall implement dedicated in pit conveyor belt with silo loading system till railway siding on or beforeDecember,2025. Accordingly, SPCB may grant CTO to strictly comply this conditions	work order for CHP SILO with Rapid Loading system of capacity 10 MTPA has been awarded and it is expected to be commissioned by June 2027. Above work will completely eliminate the road transportation and substantially reduce the fugitive emission due to vehicle movement. Copy of work order attached as Annexure 28.
6	The truck size of 40 tonne (payload) for the transportation of coal shall be deployed through dedicated road till commissioning of SILO with rapid loading system on or before December, 2025 accordingly SPCB may issue the CTO.	Truck size of 40 tonnes are being used for transportation of Coal. Copy of weighment slips attached as Annexure 36.

7	PP has to resolve suggestions/objections raised during the public hearing along with implement activities-wise proposed budget of Rs.113.33 Lakhs (as Public Hearing Budget), Rs.1250Lakhs (as EMP cost)in time bound manner as pers. no.(xvi)&(xvii) of para 47.1.3 of MoM of the EAC meeting. The details of annual expenditure shall be part of report submitted to IRO, MoEF&CC. PP needs to include the audited figures against the expenditure and activities to be monitored by through dedicated online monitoring mechanism. The maintenance of all Activities shall be covered through recurring cost of Public Hearing, which will be part of CSR budget.	Copy of updated Public Hearing compliance report attached as Annexure 37. Details of CSR expenditure for last 5 years attached as Annexure 38. CSR activities proposed in FY 25-26 attached as Annexure 39. Photos of CSR activities attached as Annexure 39.

8	PP has to implement capital budget upto Rs. 1341.37 lakh for implementing additional air pollution control measures, Rs.125 lakhs for mitigation of water pollution in time bound manne r as per s.no. (xiii)&(xix) of para 47.1.3 of MoM. It shall be monitored by IRO, MoEF&CC.	Copy of capital budget upto Rs. 1341.37 lakh for implementing additional air pollution control measures, Rs.125 lakhs for mitigation of water pollution attached as Annexure 40.
9	Install dust barrier (made up of natural fibre) with automatic fixed type sprinkling system across the village area/sensitive area.	Dust barrier along Sasti village was constructed through Bamboo matting as per compliance of subject condition. However, due to heavy storm the said structure collapsed and could not sustain. Copy of work order and completion certificate and photos of subject activity attached as Annexure T. Moreover, the wind barrie and fixed type water sprinkling system will be carried out in near future, for which the proposal is to be initiated . Action plan / commitment is attached as Annexure 41.

10	PP shall increase number of fixed type sprinkling system (near to haul road, stockyard, transportation route etc.) across the mine lease area in order to arrest the dust coming out from the mining activities.	Adequate Fixed type water sprinklers are provided in &around C.H.P. WeighBridges, coal transport roads, transfer points etc. as per direction of M.P.C.B., Chandrapur. They are being properly maintained & operated. Details of Air pollution Control measures are given as below :- Fixed sprinklers are provided at 100 MT weighbridge- 08 Nos. 1. Fixed sprinklers are provided at Main CHP - 06 Nos. 2. AlongCoaltransportationroad–04nos 3. Concrete pavement provided at coal unloading Area and loading point at mini CHP. 4. Brooming and maintenance of coal transport road and weigh bridge road is done regularly. 5. Spraying of water by 5 Nos. of Mobile Water Tankers (Hired-1 nos. Of 4 KL, Departmental – 2nos. of 28 KL each and HOE contractor – 2 nos. Of 28 KL each) 6. Concrete pavement is provided in w/s complex. 7. Coal carrying Trucks are covered with Tarpaulin. 8. Tarring of 06.00 km length of internal roads used by Coal Transportation trucks. 9. One no. of trolley mounted fogger has been commissioned at Sasti OC mine with a throw of 100m. 10. Further 3 nos. are to commissioned in July 2025. 11. Tyre wash system has been installed.

11	Implement the integrated transportation system with Dhuptala OC mine locating near to the existing mine owned by M/s Western Coalfields limited.	Complete coal from Dhuptala OC is being transported through tarpaulin covered trucks to Railway siding after passing through Tyre wash system. Complete 4.0 km of transportation road is black topped. More over truck mounted sweeping machine is deployed on he said transportation route. There are no plans of integration of transportation system with Dhuptala OC mine.
12	PP shall install additional Continuous air quality system at different locations near to village area and share online data with SPCB as well as with CPCB.	CAAQMS has been installed at Sasti OC and the data has been linked with SCPCB and CPCB servers.

13	Afforestation activity shall cover area not less than 600 ha, including reclaimed external OB dump, backfilled area, along ML boundary, along roads & infrastructure, township area. The density of the trees should be around 2500 plants per ha.	Noted and will be complied. Total Plantation of 5.60 lakhs done in Sasti OCM in 187.15Ha.

14	PP shall conduct special drive for villages such as Sasti, Gauri, Pauni and other nearby villages for air pollution mitigation measures and no coal storage yard, OB dump shall be dumped near to the villages.	Agreed to comply. Following air pollution mitigation measures will be taken for compliance of condition: 1. Distribution of plants 2. Plantation of gram panchayat land in case of availability of suitable land and NOC from gram panchayat and other government authorities. 3. Dust suppression through mobile water sprinkler. 4. Any other measures on demand of gram panchayats.
15	Water storage ponds shall be constructed of appropriate depth in nearby village in collaboration with Gram Panchayat	Water storage ponds have been constructed at 3 villages namely Mathra, Charli and Dhuptala. Dimension of tank are 40m * 30m. Photos attached as Annexure 42.
16	PP shall increase the bed capacity of the existing Hospital from 25 to 50 bedded at Sasti Township and allow local villager to avail the hospital facility. Quarterly health check-up campaign shall be conducted in all the villages located in 10km buffer area.	Health checkup campaigns are regularly carried out in villages of Buffer zone. Ammendment has been sought from MoEF&CC for exemption of this condition which was considered in EAC on 24.09.2025. Minutes for the same shall be obtained soon.
17	PP shall construct 25-sitter digital library in each village including the daily newspaper facility.	Digital library has been installed at Dhuptala village. Photos attached as Annexure 43.
18	PP shall create a "Public Grievance Redressal and Monitoring System" for resolving any issues related to the pollution of mines and complaint has to resolve as soon as possible not beyond 30 days. In this regard, adequate awareness to be spread among the public to address their grievance to company with simple and easy manner and for which company needs to devise the mechanism. The same shall be reported to IRO within 3months. A logbook to be maintained by PP on "Public Grievance Redressal and Monitoring System."	Public Grievance Redressal and Monitoring System" for resolving any issues related to the pollution of mines and complaint has been setup headed by GM(Operations).
19	PP shall conduct third party audit of compliance of EC condition at an interval six months and its report shall be submitted to IRO, MoEF&CC.	Work of third party audit of EC condition has been awarded to NEERI. Inspection conducted on 02.07.2025, report awaited.

20	The status of mine closure activities must be included in every six months compliance report submitted to the state pollution control board and IRO.	Copy of Annual mine Closure returns which contain the status of mine closure activities is attached as Annexure 45. From now onwards same will be attached with half yearly compliance report in regular manner.
21	PP to maintain the topped haul road properly to minimized the dust emission. PP to also develop pucca roads by seeking consent from the panchayat with widening of roads especially roads inter linking the villages within the study area of 10 km radius buffer zone.	Agreed and will be complied based on requirement given by villages. Topped road are maintained annually with repairing works.
22	PP to install solar lights along the road used for transportation of minerals to avoid the accidents at night and also seek its maintenance. PP is asked to also identify the rural areas for installation of solar light with its maintenance within the study area of 10 km radius buffer zone within one year.	High mast solar light towers have been installed in Gouri and mathra village. Photos of same attached as Annexure 46.
23	PP to provide bio toilets to the villages located within the study areas within 1 year from the grant of this EC.	2no. Biotoilet each have been provided in Mathra, Dhuptala and Gauri village. Photos of same attached as Annexure 47

24	PP shall conduct feasibility studies for assessment of voids for backfilling of ash and mixing of ash with overburden, taking up backfilling as hand OB mixing activities during operations as well as post closure of mines in line with the Fly Ash Utilization Notification, 2021	As per the Central Level Working Group (CLWG) deliberations, the following mines shall be considered for allotment for the purpose of fly ash filling/stowing: i. Closed or abandoned open cast mines. ii. Closed or abandoned voids of the working open cast mines. iii. Closed underground mine or working underground mine where the proposed extraction of coal is by stowing method. Since the mine is still in operation it does not have any abandoned quarry for flyash filling. Possibility for flyash filling will be explored at the time of abandonment of mine as per SOP. Copy of SOP issued by MoC attached as Annexure 48.
25	PP shall pay to farmers of agricultural land if there is any loss due to pollution found by concerned District Commissioner as per extent rules or norms	Agreed to comply, if there is any loss due to pollution found by concerned District Commissioner, PP will be liable to pay compensation to farmers of agricultural land.
26	PP shall deploy at least 20% of overall fleet of dumpers/trucks/other vehicles as electrical or CNG/LNG based for transportation of coal/OB etc.	3 nos of LNG dumpers of 30T capacity have been deployed at Sasti Expansion OC mine for Coal transportation. Photos of LNG dumpers attached as Annexure 49.

	STATUATORY COMPLAINCE	
1	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.	There is no diversion of Forest land in Sasti Expansion OC mine.
2	The project proponent shall obtain clearance from the National Board for Wildlife, if applicable	Not applicable.
3	The project proponent shall prepare a Site-Specific Conservation Plan / Wildlife Management Plan and approved by the Chief Wildlife Warden. The recommendations 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-I species in the study area).	Wildlife Conservation Plan for schedule I species have been submitted to DCF office for approval along with fund allocation of Rs. 7.0 crores. Copy of WLP attached as Annexure 34
4	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.	CTO has been obtained for capacity 2.50 MTPA valid upto 31.03.2027.
5	The project proponent shall obtain the necessary permission from the Central Ground Water Authority	CGWA NOC has been obtained a valid upto 02.08.2025. Copy attached As Annexure 20
6	Solid/hazardous waste generated in the mines needs to addressed in accordance to the Solid Waste Management Rules, 2016/Hazardous & Other Waste Management Rules, 2016.	Since the mine is run in HoE manner, there is no washing of HEMM in the premises of mine. However, ETP of 150 MLD has been provided for treatment of Workshop effluent if any.
	AIR QUALITY MONITORING AND PREVENTION	
7	Continuous ambient air quality monitoring stations as prescribed in the statue established in the core zone as well as in the Buffer zone for monitoring of pollutants, namely PM10, PM2.5, SOX, 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.	CAAQMS has been installed at Sasti OC in consultation with MPCB. Regular monitoring is done fortnightly as below: 1.BSOA-1–FilterplantatGouricolony. 2. BSOA-2-Sastivillage. 3. BSOA-3–SAMOffice. 4. BSOA-4–AreaStore. Ambient Air quality monitoring is being carried out as per GSR 742(E). The monitoring reports on quarterly basis are submitted to MOFF, and MPCB Chandrapur as per directives. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc is also being carried out at least once in six months by CMPDIL.

8	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 Contro l 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.	Ambient Air quality monitoring is being carried out as per GSR 742(E). The monitoring reports on quarterly basis are submitted to MOFF, and MPCB Chandrapur as per directives. Data on ambient air quality and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring data is regularly reported to the Ministry/Regional Office and to the CPCB/SPCB.
9	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 shall be carried out in critical areas prone to air pollution(with higher Values of PM/PM) 102.5 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.	Transportation of coal, to the extent permitted by road, is carried out by tarpaulin covered trucks. Adequate Fixed type water sprinklers are provided in & around C.H.P. Weigh Bridges, coal transport roads, transfer points etc. as per direction of M.P.C.B., Chandrapur. They are being properly maintained & operated. Details of Air pollution Control measures are given as below :- Fixed sprinklers are provided at 100 MT weighbridge- 08 Nos. 1. Fixed sprinklers are provided at Main CHP - 06 Nos. 2. AlongCoaltransportationroad–04nos 3. Concrete pavement provided at coal unloading Area and loading point at mini CHP. 4. Brooming and maintenance of coal transport road and weigh bridge road is done regularly. 5. Spraying of water by 5 Nos. of Mobile Water Tankers (Hired-1 nos. Of 4 KL, Departmental – 2nos. of 28 KL each and HOE contractor – 2 nos. Of 28 KL each) 6. Concrete pavement is provided in w/s complex. 7. Coal carrying Trucks are covered with Tarpaulin. 8. Tarring of 06.00 km length of internal roads used by Coal Transportation trucks. 9. One no. of trolley mounted fogger has been commissioned at Sasti OC mine with a throw of 100m. 10. Further 3 nos. are to commissioned in July 2025. Tyre wash system has been installed.

10	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 constructa' bypass' road, it should be so constructed so that the impact of sound, dust and accidents could be appropriately mitigated.	Complied. The transportation of coal is carried out as per the provisions and route envisaged in the approved Mining Plan/environment monitoring plan.
11	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.	Vehicular emissions is being kept under control and regularly monitored. All the vehicles engaged in mining and allied activities operate only after obtaining 'PUC' certificate from the authorized pollution testing centres.
12	Coal stock pile/crusher/feeder and breaker material transfer points shall invariably be provided withdust suppression system. Belt-conveyors 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.	Drills are being wet operated. Details of Air pollution Control measures are given as below :- Fixed sprinklers are provided at 100 MT weighbridge- 08 Nos. 1. Fixed sprinklers are provided at Main CHP - 06 Nos. 2. AlongCoaltransportationroad–04nos 3. Concrete pavement provided at coal unloading Area and loading point at mini CHP. 4. Brooming and maintenance of coal transport road and weigh bridge road is done regularly. 5. Spraying of water by 5 Nos. of Mobile Water Tankers (Hired-1 nos. Of 4 KL, Departmental – 2nos. of 28 KL each and HOE contractor – 2 nos. Of 28 KL each) 6. Concrete pavement is provided in w/s complex. 7. Coal carrying Trucks are covered with Tarpaulin. 8. Tarring of 06.00 km length of internal roads used by Coal Transportation trucks. 9. One no. of trolley mounted fogger has been commissioned at Sasti OC mine with a throw of 100m. 10. Further 3 nos. are to commissioned in July 2025. Tyre wash system has been installed.
13	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.	Agreed and will be complied.
	WATER QUALITY MONITORING AND PREVENTION	

1	The effluent discharge (mine waste water, workshop effluent) shall be monitored in terms of the parameters notified under the WaterAct,1974 Coal Industry Standards vide GSR742(E) dated 25th September, 2000 and as amended from time to time by the Central Pollution Control Board.	The effluent discharge (mine waste water, workshop effluent) is being monitored on fortnightly basis by CMPDIL 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

2	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-lA.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.	The monitoring data is being uploaded on the company's website. Also, Same is being reported to MPCB/CPCB/MoEF&CC on six monthly basis.
3	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 and 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 groundwater level and quality is being carried out in and around the mine lease area by establishing a network of existing wells and constructing new piezometers during the mining operations. The monitoring of ground water levels is carried out four times a year i.e. pre-monsoon, monsoon, post-monsoon and winter. The ground water quality is monitored once a year, and the data thus collected is sent regularly to MOEFCC/RO on half yearly basis. **Photo of Piezometer enclosed as Annexure 51.** **Copy of Ground water analysis and level monitoring attached as Annexure - 50**
4	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.	Agreed and will be complied.
5	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.	Ground water, excluding mine water, is not be used for mining operations. Rainwater harvesting have been implemented for conservation and augmentation of ground water resources at various office buildings in Ballarpur Area.

6	Catch and/or garland drains and siltation ponds in adequate numbers and appropriate size shall be constructed around the mine working, 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	Settling / sedimentation pond of appropriate size has been constructed to treat the industrial(Mine activity area) effluent including water pumped out from mine considering peak discharge. The water so treated is being used within the mine premises for dust suppression, watering of PLANTATION, Industrial use, fire fighting.. Garland drains of appropriate different sizes of 3.00x2.00, 2.00x1.5, & 1.5.x1.00mtr. for a total length of 12235.00mtr.have been provided along the periphery of excavated area as well as OBD. Desilting is being done every year before onset of monsoon. Further construction of Garland drains will be taken up as per requirement of mine with due regards to safety.
7	The drains/ ponds so constructed shall be 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.Theplantationof native species to be made between toe of the dump and adjacent field/habitation/water bodies.	OB Dumps which are adjacent to coal transport roads. The Dump are also thickly planted on top as well as on slope. The afforestation have become so dense and self sustaining that the side slope is not at all visible. The plants have attained the height of approx, 9 to 10 mtrs. In the present operating portion of mine specially benches, such retaining wall is not required. More over cross drainage in OB benches have been provided which carry all the silts & sediments ultimately to mine sump provided at the floor of seam. The sump capacity is sufficient enough to allow settlement of suspended matter significantly and only supernatant water is pumped out on surface. Desilting of drains is being done before onset of monsoon every year.

8	Adequate groundwater recharge measures shall be taken up for augmentation of ground water. The project authorities shall meet water requirement of nearby village(s) after due treatment conforming to the specific requirement (standards).	Rainwater harvesting have been implemented for conservation and augmentation of ground water resources at various office buildings in Ballarpur Area. Water is being supplied to nearby villages through tankers during dry season to cater to their water requirement. Details of RWH installed in and around mine attached as Annexure 52

9	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.	Since the mine is run in HoE manner, there is no washing of HEMM in the premises of mine. However, ETP of 150 MLD has been provided for treatment of Workshop effluent if any.
10	The water pumped out from the mine, after siltation, shall be utilized 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.	Mine discharge after treatment through sedimentation tank is being utilized for dust suppression and fire fighting purposes. Desilting of drains is being done before onset of monsoon every year.
11	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/lakeetc, 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/EMPreport and with due approval of the concerned State/GoI Authority. The construction of embankment to prevent any danger against in rush 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.	The surface drainage plan and/or any diversion of natural water courses will 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 in rush of surface water into the mine will be as per the approved Mining Plan and as per the permission of DGMS or any other authority as prescribed by the law.
12	The project proponent shall take all precautionary measures to Ensure riverine/ riparian ecosystem in and around the coal mine up to a distance of 5km. A rivarine/ riparian ecosystem conservation and management plan should be prepared and implemented in consultation with the irrigation /water resource department in the state government.	Copy of study undertaken by IIT Kahragpur attached as Annexure 33.

	NOISE AND VIBRATION MONITORING AND PREVENTION	
1	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.	Regular monitoring through CMPDIL is being done on fortnightly basis and the results are within limits, Workers exposed to high noise level are provided with earplugs/muffs. HEMM are properly maintained and kept in good condition. Noise proof cabins of HEMM are also provided. Sound level meter is used for measuring noise levels at work place and records are maintained.

2	Controlled blasting techniques shall be practiced in order to mitigate ground vibrations, fly rocks, noise and air blast etc., as per the guidelines prescribed by the DGMS.	Blasting is done as per Scientific Blasting study n order to mitigate ground vibrations, fly rocks, noise and air blast etc., as per the guidelines prescribed by the DGMS.
3	The noise level survey shall be carried out as per the prescribed guidelines to assess noise exposure of the workmen at vulnerable points in the mine premises, and report in this regard shall be submitted to the Ministry/RO on six-monthly basis.	The noise level survey is being carried out on a fortnightly basis as per the prescribed guidelines to assess noise exposure of the workmen at vulnerable points in the mine premises, and report in this regard is being submitted to the Ministry/RO on six- monthly basis.
	MINING PLAN	
1	Mining shall be carried out under strict adherence to provisions of the Mines Act 1952 and subordinate legislations made there- under as applicable.	Agreed. Mining has been carried out as per provision of duly approved Mining plan. Copy of Mining plan attached as Annexure 53
2	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).	Mining has been 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). Copy of Mining plan attached as Annexure 53
3	No mining shall be carried out in forest land without obtaining Forestry Clearance as per Forest (Conservation) Act, 1980.	Not applicable as no forest land involved in Sasti Expansion OC mine.
4	Efforts should be made to reduce energy and fuel consumption by conservation, efficiency improvements and use of renewable energy.	Solar power station of 60Kwh and11Kwh has been setup at Ballarpur Area for energy conservation. Also, use of LED bulbs have been made for reduction in energy usage. Details of LED bulbs fixtures, energy efficient devices and EV deployment attached as Annexure 54
	LAND RECLAMATION	
1	Digital Survey of entire lease hold area/core zone using Satellite Remote Sensing survey shall be carried out at least once in three yearsformonitoringlandusepatternandreportin1:50,000scale or as notified by Ministry of Environment, Forest and Climate Change(MOEFCC) from time to time shall be submitted to MOEFCC/Regional Office (RO).	Digital Survey of entire lease hold area/core zone using Satellite Remote Sensing survey is being carried out Patternandreportin1:50,000 scale every year for monitoring land use.

2	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.	Agreed to comply. Final mine closure plan will be prepared within 5 years of the closure of mine as per latest guidelines of MoC. The concern regarding reclamation and aquatic life conservation will be duly addressed in the final mine closure plan.
3	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-a- vis the post mining land use pattern shall be submitted to the MOEFCC/RO.	Condition in compliance. Entire excavated area, backfilling, external OB dumping (including top soil) and afforestation plan is in conformity with the "during mining"/"post mining" land-use pattern, which is an integral part of the approved Mining Plan.
4	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 MoEF&CC, CPCB and SPCB.	Noted

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<td>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 top soil shall be used for land reclamation and plantation purposes. Active OB dumps shall be stabilised with native grass species to prevent erosion and surface runoff. The other overburden dumps shall be vegetated with native flora species. The excavated area shall be backfilled and afforested inline 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.</td>
<td>It is being done.Total Plantation of 5.40 lakhs done in Sasti OCM in 179.15 Ha.
<table>
<tr><th>Sr no.</th><th>Year</th><th>Plantation (nos.)</th><th>Area (Ha)</th><th>Species</th></tr>
<tr><td>1</td><td>1993-94</td><td>47425</td><td>9.48</td><td rowspan="7">Neem,Sissoo, Gulmohar, Mango,Amla, Jamun, Soniya, Bija, Maruk, Kavath,Khair, Karanj, Kadamba,</td></tr>
<tr><td>2</td><td>1994-95</td><td>60000</td><td>12.0</td></tr>
<tr><td>3</td><td>1995-96</td><td>40000</td><td>8.0</td></tr>
<tr><td>4</td><td>1995-96</td><td>25000</td><td>5.0</td></tr>
<tr><td>5</td><td>1996-97</td><td>35000</td><td>14</td></tr>
<tr><td>6</td><td>1997-98</td><td>22000</td><td>8.0</td></tr>
<tr><td>7</td><td>1997-98</td><td>37000</td><td>14.4</td></tr>
<tr><td>8</td><td>1997-98</td><td>2000</td><td>0.4</td><td rowspan="12">Siras, Bamboo, Arjun,Ber, etc.</td></tr>
<tr><td>9</td><td>1998-99</td><td>66575</td><td>26.17</td></tr>
<tr><td>10</td><td>1998-99</td><td>34000</td><td>13.50</td></tr>
<tr><td>11</td><td>1998-99</td><td>2000</td><td>0.70</td></tr>
<tr><td>12</td><td>1999-00</td><td>34000</td><td>13.30</td></tr>
<tr><td>13</td><td>2000-01</td><td>30000</td><td>12.0</td></tr>
<tr><td>14</td><td>2002-03</td><td>18750</td><td>7.50</td></tr>
<tr><td>15</td><td>2002-03</td><td>22250</td><td>8.90</td></tr>
<tr><td>16</td><td>2007-08</td><td>25000</td><td>10.0</td></tr>
<tr><td>17</td><td>2009-10</td><td>2000</td><td>0.80</td></tr>
<tr><td>18</td><td>2013-14</td><td>12500</td><td>5.00</td></tr>
<tr><td>19</td><td>2024-25</td><td>25000</td><td>10.0</td><td></td></tr>
<tr><td></td><td>Total</td><td>540000</td><td>179.15</td><td></td></tr>
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<td>6</td>
<td>The project proponent shall make necessary alternative arrangements, if grazing land is involved in core zone, in consultation with the State government to provide alternate areas for livestock grazing, if any. In this context, the project proponent shall implement the directions of Hon'ble Supreme Court with regard to acquiring grazing land.</td>
<td>No Grazing land in core zone of Sasti Expansion OC mine.</td>
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<td>GREENBELT</td>
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<td>1</td>
<td>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.</td>
<td>Wildlife Conservation Plan for schedule I species have been submitted to Deputy Conservator of Forest for approval along with fund allocation. Copy of Wildlife conservation plan enclosed as Annexure 34</td>
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2	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.	It is being done. Total Plantation of 5.40 lakhs done in Sasti OCM in 179.15 Ha. reclaimed.

	PUBLIC HEARING AND HUMAN HEALTH ISSUES	
1	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 ensured in all mine locations (as per DGMS standards) and monitored on a weekly basis. The report of same attached as Annexure 55. From now onwards the same will be submitted to this ministry & it's RO on six- monthly basis.
2	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 operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any, as amended time to time	Periodical medical Examinations (P.M.E.) are carried out on compulsorily on each employee once in five years with the purpose of detecting and keeping records of diseases with specific importance to Coal Worker's Pneumoconiosis. This is covered under Statute .During P.M.E.,the candidates are subjected to a complete clinical examination, (including acuity of vision and hearing), radiological examination of chest and routine examination of blood and urine. In case some abnormality is detected during the course of the above examination, further investigations are carried out , as required. When a person is diagnosed as having a certain disease, he is referred to the concerned specialist for confirmation and initiation of treatment

3	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.	PPE kit is being distributed on regular basis. PPE include Jackets, Helmets, Ear plugs, masks, Gumboots, SafetyShoes, Googles, waterbottle etc.
4	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. Landoustees shall be compensated as per the norms laid down in the R&R policy of the company/State Government/Central Government, as applicable.	Agreed and will be complied.

5	The project proponent shall follow the mitigation measures provided in this Ministry's OM No.Z-11013/5712014-IA.I1(M) dated 29 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'.	Agreed. Compliance attached as Annexure 56.
	CORPORATEENVIRONMENTRESPONSIBILITY	
1	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.	The company has a well laid Corporate Environmental Policy duly approve by the Board of Directors. Copy of CER policy attached as Annexure - 57
2	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.	At HQ,WCL- The cell is headed by GM(Env) reporting to Director (Technical). The team comprises of multi-disciplinary trained executive. At Area level–Area General Manager head s the Environment Department assisted by GM(oprn), ANO(Envt), & 2 Deputy Managers and 1 Assistant Managers of Environment discipline. At Unit Level- Environment Management Cell is headed by Sub-Area Manager and assisted by Mine Manager, Project Nodal Officer (Env) at unit level.
3	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 Compliance Report.	The year wise funds are earmarked for environmental protection measures are kept in separate account and not diverted for any other purpose. Responsibility matrix enclosed as Annexure 31.
4	Self environmental audit shall be conducted annually .Every three years third party environmental audit shall be carried out.	Noted and Agreed.
	MISCELLANEOUS	

1	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.	Paper publication for receiving EC was made in Hitwada and Mahavidarbha newspapers on 20.09.2023
2	The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Governmentwhointurnhastodisplaythesamefor30daysfromth e date of receipt.	Agreed and complied.
3	The project proponent shall upload the status of compliance of The stipulated environment clearance conditions, including results of monitored data on their website and update the same on half- yearly basis.	Noted and Agreed. Status of compliance of the Stipulated environment clearance conditions, including results of monitored data is being updated on website on half-yearly basis.

4	The project proponent shall monitor the criteria pollutants level namely; PM,SO, 102 NOx(ambient levels) or critical ectoral parameters, indicated for the projects and display the same at a convenient location for disclosure to the public and put o the website of the company.	Stipulated environment clearance conditions, including results of monitored data is being updated on website on half-yearly basis
5	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	Latest six monthly report has been submitted for period of October 2024 to March 2025. Covering letter attached as Annexure 35.
6	The project proponent shall follow the mitigation measures provided in this Ministry's OM No.Z-11013/5712014-IA.I1(M) th 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 Agreed.
7	He 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 onthe website of the company.	The environmental statement for financial year 23-24 in Form-V has been submitted. Also further submission will be made in a timely manner. Copy attached.

8	The project authorities shall inform to the Regional Office of the MOEFCC regarding commencement of mining operations.	Noted andAgreed.
9	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government	All stipulations made by the State Pollution Control Board and the State Government shall be followed.
10	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.	The project proponent will 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
11	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 and Agreed.
12	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 and Agreed.
13	he Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.	Noted and Agreed.

14	The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.	Noted and Agreed.
15	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 and Agreed.
16	The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974,theAir(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 InsuranceAct,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 and Agreed.
17	The proponent shall abide by all the commitments 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 and Agreed.

18	The proponent shall obtain all necessary clearances/approvals that maybe 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 Agreed.
19	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.
20	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, interms 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 & others.	Noted and Agreed.
21	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.	Not Applicable.
22	This environmental clearance 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 and Agreed
23	All other conditions stipulated in the EC vide its letter J-11015/435/2006-IA.II (M) dated 17.05.2007, shall remain unchanged.	Noted and Agreed.

MAHARASHTRA POLLUTION CONTROL BOARD

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

Kalpataru Point, 2nd, 3rd 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-0000182369/CO/2503001345

Date: 09/03/2025

To,
M/s Sasti Open Cast Mine,
Western Coalfields Limited,
Toposheet no 56 of Survey of India,
PO: Sasti, Tal:Rajura,Dist: Chandrapur.

Your Service is Our Duty

Sub: Renewal consent to operate with amalgamation of both consents.

Ref:

1. Earlier Consent to Operate granted (Coal - 0.5 MTPA) by Board Vide UAN No. Format1.0/CAC/UAN No.MPCBCONSENT-0000152899/CO/2302001891 dtd. 27/02/2023.
2. Earlier Consent to Operate granted (Coal - 2.0 MTPA) by Board Vide UAN No. Format1.0/CAC/UAN No.MPCB-CONSENT-0000109109/CR/2211000591 dtd. 09/11/2022.
3. Minutes of 14th Consent Appraisal Committee (CAC) Meeting Part-I held on dtd. 07.01.2025.

Your application No.MPCB-CONSENT-0000182369 Dated 23.09.2023

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 and Rule 18(7) 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 operate is granted for a period up to 31/03/2025**
2. **The capital investment of the project is Rs.371.59 Crs. (As per undertaking submitted by pp Existing CI- Rs. 281.34 Cr + Expansion in CI - Rs. 90.25 Cr))**
3. **Consent is valid for the manufacture of:**

Sr No	Product	Maximum Quantity	UOM
Products			
1	Coal	2.5	MTPA

(Coal Mining on Mine Lease Area of 919.69)

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	7170	As per Schedule-I	Recycle to the maximum extent for Dust Suppression & Fire Fighting and remaining on land for plantation/Irrigation/Gardening
2.	Domestic effluent	30.0	As per Schedule-I	Soaked in soak pit

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	As per Schedule -II

6. **Non-Hazardous Wastes:**

Sr No	Type of Waste	Quantity	UoM	Treatment	Disposal
1	Overburden	114000	m3/month	Landfilling	Backfilling and Reclamation of Land

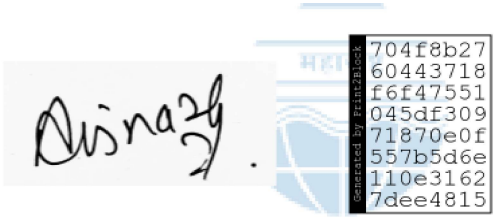
7. **Conditions under Hazardous & Other Wastes (M & T M) Rules 2016 for Collection, Segregation, Storage, Transportation, Treatment and Disposal of hazardous waste:**

Sr No	Category No./ Type	Quantity	UoM	Treatment	Disposal
1	5.1 Used or spent oil	40	KL/A	Recycle	send to Authorized recycler
2	5.2 Wastes or residues containing oil	8	Ton/Y	At CHWTSDF Butibori	CHWTSDF
3	35.3 Chemical sludge from waste water treatment	50	Ton/Y	Secured 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. PP shall carry out over burden dump management as per CPCB guidelines.
11. PP shall carry out plantation as per EC condition before ensuing monsoon.
12. The industry shall obtain necessary permission from the Directorate of Industrial Safety and Health (DISH).
13. The applicant shall not carry out any excess production or new activity without obtaining Consent of the Board and without obtaining Environmental Clearance wherever it applicable.

14. PP shall upgrade existing STP to achieve consented prescribed standards within 3 months
15. This consent is issued with overriding effect of earlier consent to Operate granted by Board vide No-Format1.0/CAC/UAN No.MPCBCONSENT-0000152899/CO/2302001891 dtd. 27/02/2023.
16. The applicant shall comply with the conditions of the Environmental Clearance granted by MoEF-CC,GoI vide letter J-11015/435/2006-IA.II(M) dated 17/05/2007 and its amendments.
17. This consent is issued pursuant to the decision of the 14th Consent Appraisal Committee (CAC) Meeting Part-I held on dtd. 07.01.2025.
18. The applicant shall make an application for renewal of consent 60 days prior to date of expiry of the consent.
19. The industry shall create an Environment Cell by appointing an Environmental Engineer OR Expert for looking after day-to-day activities related to Environment OR Pollution control.

This consent is issued on the basis of information/documents submitted by the Applicant/Project Proponent, if it has been observed that the information submitted by the Applicant/Project Proponent is false, misleading or fraudulent, the Board reserves its right to revoke the consent & further legal action will be initiated against the Applicant/Project Proponent.



Signed by: Dr.Avinash Dhakne
Member Secretary
For and on behalf of,
Maharashtra Pollution Control Board
ms@mpcb.gov.in
2025-03-09 13:15:19 IST

Received Consent fee of -

Sr.No	Amount(Rs.)	Transaction/DR.No.	Date	Transaction Type
1	3486372.00	MPCB-DR-21943	16/10/2023	RTGS

Previous balance consent fee of Rs. 37,464.0/-as per UAN No. MPCB-CONSENT-0000152899 is considered in this renewal of consent. Total Paid Fee: Rs. 34,86,372.0 + Rs. 37,464.00 (Previous Balance) + 9 months adjustment for 0.5 MTPA Consent is Rs. 571,901.85 = Rs 4,095,737.85. Calculation: Consent fee for two terms fee is Rs. 11,25,071.6/- + Mining Projects Fee 20,00,000 + 701 days late 25.0 lakhs B.G. submission charges Rs. 5,76,164/- = Rs 3,701,235.6/-.

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 up-dation purpose

SCHEDULE-I

Terms & conditions for compliance of Water Pollution Control:

1. A] ETP having Capacity 150 CMD provided which comprises of collection tank- Oil skimmer-Clarifloculator-treated effluent tank and SDB. Sedimentation tank having capacity 600 CMD provided for treatment of Mine water discharge.

   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 8.5
(2)	Oil & Grease	10
(3)	BOD (3 days 27°C)	30
(4)	Total Suspended solids	100
(5)	Total Dissolved solids	2100
(6)	COD	250

   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 decentralized septic tank followed by Soak pit for the treatment of 30 CMD of sewage in mining area and mining offices

   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	100 mg/l
2		Not to exceed	

   C] The treated sewage shall be soaked in soak pit and overflow if any shall be discharged on land for gardening within premise after confirming above standards.

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	566.00
2.	Domestic purpose	40.00
3.	Processing whereby water gets polluted & pollutants are easily biodegradable	200.00
4.	Processing whereby water gets polluted & pollutants are not easily biodegradable and are toxic	0.00
5.	Gardening	10.00

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	-		0.00	- 0 -- 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 be 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 transportation shall be done by installing conveyors wherever possible & mechanically covered closed trucks shall be used for transportation.Overloading of dumpers shall be avoided to prevent spillages.
   d. The applicant shall carry out tree plantation along road side, around dumps or compulsory afforestation as per proposal approved by Forest Department. The tree plantation programme shall be taken up well in advance of the actual mining activity, so that green belt of sufficient width & height is developed between mining area/road and surrounding environment.
   e. Black topped metal roads provided shall be well maintained to prevent dust formation.
   f. 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.
   g. Correct type & quantity of explosive shall be used to avoid excess dust formation & vibration in the surrounding area.
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. 2.0 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	31.03.2026
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.	6 months	31.03.2026
3	C2R	Rs.25.0 Lakh	15 days	Coal transportation shall be done by covered trucks. Overloading of shall be avoided to prevent spillages.	Regular Activity	31.03.2026
4	C2R	Rs.5.0 Lakh	15 days	Coal Handling Plant (CHP) & loading / unloading area will be provided with Automatic Mist type Water Sprinkler.	3 months	31.03.2026
5	C2R	Rs.5.0 Lakh	15 days	Convert existing water sprinkling arrangement into chemical fogging arrangement (MgCl2)	3 months	31.03.2026
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	31.03.2026
7	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	31.03.2026
8	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	31.03.2026
9	C2R	Rs.5.0 Lakh	15 days	PP shall provide Truck mounted Fog cannon system within 3 months	3 Months	31.03.2026

Sr. No.	Consent (C2E/ C2O /C2R)	Amt of BG Imposed	Submission Period	Purpose of BG	Compliance Period	Validity Date
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	31.03.2026
11	C2R	Rs.25.0 Lakh	15 days	Towards Operation and Maintenance of pollution control system & compliance of consent and Environment Clearance conditions.	Regular Activity	31.03.2026

****Existing BG obtained for above purpose if any, may be extended for period of validity as above.**

If the above Bank Guarantee is not submitted within stipulated period, then 12% interest will be levied as a penalty as per circular dtd 29/02/2024 No. BO/MPCB/AS(T)/Circular/B-240229FTS0122

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.

DATA SHEET

S. No.	Particulars	Details
1	**Project type**	Opencast Coal Mining Project
2	**Name of the Project**	Sasti Expansion Opencast Coal Mine
	Clearance letter	E.C.No. J-11015/435/2006-IA.II (M) Dated: 13.09.2023
4	**Location**	
	a) **District**	Chandrapur
	b) **State**	Maharashtra
	c) **Latitude/Longitude**	Latitude – 18°47'5" second and 19° 49'5" North Longitude – 79°18' 30" and 79°18' 20"
5	**Address for Correspondence**	
	a) **Address of concerned project chief Engineer with pin code & Telephone**	Sub Area Manager, SASTI OC MINE Ballarpur Area, WCL Post:- SASTI Tq:- RAJURA, Distt. Chandrapur(M.S) – 442706
	b) **Address of concerned project Engineer with pin code & Telephone**	Sub Area Manager, SASTI OC MINE Ballarpur Area, WCL Post:- SASTI Tq:- RAJURA, Distt. Chandrapur(M.S) – 442706
6	a) **Salient Features of the project**	The subject mine is an opencast coal mine in an ML area of 1120.48 ha. There is no forest land. Land use pattern:

Sr no	Details	Area (Ha)
1	Excavated Area	544.79
2	External Dump	149.54
3	Infrastructure	79.52
4	Top soil dump	52.98

<table>
<tr><td></td><td></td><td><table>
<tr><td>5</td><td>Rationalization</td><td>239.25</td></tr>
<tr><td>6</td><td>Embankment</td><td>37.8</td></tr>
</table></td></tr>
<tr><td></td><td>b) Environment Management Plan</td><td>As per EIA-EMP</td></tr>
<tr><td>7</td><td>Break – Up of the project area</td><td>Total Area – 1120.48 Ha
Agricultural land – 1085.98 Ha
Govt Land – 34.50 Ha</td></tr>
<tr><td>8</td><td>Break – up of the project affected Population enumeration of those losing houses/dwelling unit only and agricultural land less laborers/artisans.
a) SC, ST /Adivasis
b) Others</td><td>No R&R involved</td></tr>
<tr><td>9</td><td>Financial Details
a) Project</td><td>Sale Price – Rs. 2177.27/- per Tonne
Cost of Production – 1440.08/- per Tonne</td></tr>
<tr><td></td><td>b) Environmental Management Cost</td><td>In built in Project cost</td></tr>
<tr><td></td><td>c) Actual Expenditure incurred in project</td><td>Detailed as below:<table>
<tr><td>Sr no.</td><td>Work details</td><td>Cost (Rs. Lakhs)</td></tr>
<tr><td>1</td><td>Provision of ETP</td><td>30</td></tr>
<tr><td>2</td><td>Provision of Sedimentation tank</td><td>20</td></tr>
<tr><td>3</td><td>Trolley mounted Fog cannon</td><td>17</td></tr>
<tr><td>4</td><td>Tyre wash system</td><td>35</td></tr>
<tr><td>5</td><td>Fixed sprinklers</td><td>40</td></tr>
<tr><td></td><td>TOTAL</td><td>142</td></tr>
</table></td></tr>
<tr><td></td><td>d) Actual Expenditure incurred in Environmental Management plan</td><td>Rs. 300 Lakhs approx. (Revenue Expenditure)</td></tr>
<tr><td>10</td><td>Forest land requirement</td><td></td></tr>
<tr><td></td><td>a) The status of approval for diversion of forest land for non-forestry use</td><td>NA</td></tr>
</table>

	b) **The status of clearing /felling**	No tree felling required
	c) **Comments on viability and sustainability of compensatory afforestation in the light of actual field experience so far**	NA
11	**Status of construction (Actual/ planned) Date of completion (Actual/ planed)**	-
12	Reason for delay	-
13	Date of site visit a) **The date on which the project was monitored by the regional officer, MoEF, Regional Office.**	29.12.2022

"Under jurisdiction of Nagpur Court only"

वेस्टर्नकोलफिल्ड्सलिमिटेड
(निनी रत्न कम्पनी)
कार्यालय : उपक्षेत्रीय प्रबंधक, सास्ती उपक्षेत्र
बल्लारपुर क्षेत्र
पोस्ट : सास्ती, तहसील: राजुरा, जिला :चंद्रपुर(म.रा)
पिनकोड: 442706, फोन : 07173 – 254022

Western Coalfields Limited
(A Mini Ratna Company)
Office : Sub Area Manager, Sasti Sub Area,
Ballarpur Area
Po:Sasti,Tah:Rajura,Dist:Chandrapur(MS)
Pin Code: 442706, Phone No :07173 - 254022

फैक्टी. कार्या. : कोलईस्टेट, सिविललाईन्स, नागपुर–440 001
Regd. Office : Coal Estate, Civil Lines, Nagpur-400 001

CIN : U10100MH1975GOI018626
Website : www.westerncoal.nic.in

पत्र क : वेकोलि / बक्षे / साउक्षे / उक्षेप्र / 1788

दिनांक: 22. 09 2025
23

COAL AND OB PRODUCTION DETAILS OF SASTI EXPANSION OPENCAST MINE

Sr no	Year	Coal (MTPA)	OB (Mm^3)
1	22-23	2.45	8.74
2	23-24	1.888	13.18
3	24-25	2.006	24.62

उपक्षेत्रीय प्रबंधक, 23/9
सास्तीउपक्षेत्र

Maharashtra Pollution Control Board

महाराष्ट्र प्रदूषण नियंत्रण मंडळ

FORM V

(See Rule 14)

Environmental Audit Report for the financial Year ending the 31st March 2024

Unique Application Number	Submitted Date
MPCB-ENVIRONMENT_STATEMENT-0000072601	27-09-2024

PART A

Company Information

Company Name	Application UAN number
Western Coal Fields Ltd Sasti Opencast Mine	152899

Address

Sasti Opencast Mine, WCL, Ballarpur Area, Taluka: Rajura, Dist: Chandrapur - 442706

Plot no	Taluka	Village
-	Rajura	-
Capital Investment (In lakhs)	**Scale**	**City**
28126.79	LSI	Chandrapur
Pincode	**Person Name**	**Designation**
442706	Shri Manish Podey	Sub Area Manager
Telephone Number	**Fax Number**	**Email**
9422135447	07173230076	envsocm@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.MPCBCONSENT-0000152899/CO/2302001891	2023-02-27
Consent Valid Upto	**Establishment Year**	**Date of last environment statement submitted**
2023-12-31	1985	Sep 28 2023 12:00:00:000AM

Industry Category Primary (STC Code) & Secondary (STC Code)

Product Information

Product Name	Consent Quantity	Actual Quantity	UOM
COAL	2.5	1.889	MT/A

By-product Information

By Product Name	Consent Quantity	Actual Quantity	UOM
-	0	0	MT/A

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	566.00	566
Cooling	0.00	0
Domestic	40.00	40
All others	210.00	0
Total	816.00	606

2) Effluent Generation in CMD / MLD

Particulars	Consent Quantity	Actual Quantity	UOM
TRADE EFFLUENT	7062	6456	CMD
DOMESTIC EFFLUENT	10	10	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	0.084	0.109	CMD

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
EXPLOSIVE	1.495	2.968	

4) Fuel Consumption

Fuel Name	Consent quantity	Actual Quantity	UOM
Diesel	0	3580	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
WATER REPORT ATTACHED IN PART I	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
-	0	0	-	-	NO STACK EMMISSION

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	10	39.155	KL/A
5.2 Wastes or residues containing oil	1	1	Ton/Y

2) From Pollution Control Facilities

Hazardous Waste Type	Total During Previous Financial year	Total During Current Financial year	UOM
35.3 Chemical sludge from waste water treatment	4	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	8473000	15394000	M3/Anum

2) From Pollution Control Facilities

Non Hazardous Waste Type	Total During Previous Financial year	Total During Current Financial year	UOM
-	0	0	Ton/Y

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	Kg

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
5.2 Wastes or residues containing oil	0	Ton/Y	-
35.3 Chemical sludge from waste water treatment	0	Ton/Y	-
5.1 Used or spent oil	0	KL/A	-

2) Solid Waste

Type of Solid Waste Generated	Qty of Solid Waste	UOM	Concentration of Solid Waste
-	0	Ton/Y	-

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)

IN COMPARISION TO PREVIOUS FINANCIAL YEAR	0	1.898	-1945000	3508000	0	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)***
-	-	0

[B] Investment Proposed for next Year

Detail of measures for Environmental Protection	***Environmental Protection Measures***	***Capital Investment (Lacks)***
Installation of CAAQMS along with room with proper electric fittings,air conditioners, furnitures, etc.	Air quality monitoring	87
Construction of Piezometer and procurement of DWLR with and without telemetry	Ground water monitoring	16

Part-I

Any other particulars for improving the quality of the environment.

Particulars

-

Name & Designation

Shri Manish Podey, Sub Area Manager

UAN No:

MPCB-ENVIRONMENT_STATEMENT-0000072601

Submitted On:

27-09-2024

ANNEXURE – 9

IME, PME & VTC DETAILS, SOCM

Departmental PME data for last 5 years

Sr no	Year	PME conducted (nos)
1	2021	253
2	2022	263
3	2023	298
4	2024	266
5	2025 (upto August)	235

Contractual IME conducted for last 3 years

Sr no	Year	PME conducted (nos)
1	2022	295
2	2023	308
3	2024	695
4	2025 (upto August)	330

VTC conducted in last 3 years:

Sr no.	Year	Departmental VTC	Contractual VTC
1	2023-24	113	162
2	2024-25	77	518
3	2025-26 (upto August)	62	330

Annexure – 10

Geo Tagged Photos of Sedimentation Pond, Sasti OC Mine

Annexure – 10

Geo Tagged Photos of Garland Drain, Sasti OC Mine

Project No: SSP/N/241/17-18

Final report
on

SCIENTIFIC INVESTIGATIONS FOR DESIGN OF CONTROLLED BLASTING PATTERN WITH SME EXPLOSIVES AT SASTI EXPANSION OPENCAST COAL MINE, BALLARPUR AREA OF M/S WESTERN COALFIELDS LIMITED

Prepared for

M/s WESTERN COALFIELDS LIMITED

Investigators

Dr. P. B. Choudhury	Principal Scientist / Project Leader
Sri A. G. Sangode	Senior Technical Officer
Dr. J. C. Jhanwar	Chief Scientist
Dr. M. Ramulu	Sr. Principal Scientist / Project Co-ordinator

CSIR-CENTRAL INSTITUTE OF MINING & FUEL RESEARCH
(a constituent of Council of Scientific & Industrial Research)
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E-mail: cmrirc@dataone.in, partho@cimfr.nic.in

December 2018

Project No: SSP/N/241/17-18

Final report

on

SCIENTIFIC INVESTIGATIONS FOR DESIGN OF CONTROLLED BLASTING PATTERN WITH SME EXPLOSIVES AT SASTI EXPANSION OPENCAST COAL MINE, BALLARPUR AREA OF M/S WESTERN COALFIELDS LIMITED

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E-mail: cmrirc@dataone.in, partho@cimfr.nic.in

December 2018

Final Report
on

Scientific investigations for design of controlled blasting pattern with SME explosives at Sasti Expansion Opencast Coal mine, Ballarpur Area of M/s Western Coalfields Limited

PROJECT NO. SSP/N/241/17-18

This report is meant for internal use of the sponsor organisation only and it should not be published in full or part by the sponsor organisation or its staff. It should not be communicated / circulated to outside parties except concerned Government Organisations.

CSIR-CIMFR reserves the right to publish the result of the research for the benefit of the industry in general.

Signature of the Project Proponents

Partho Choudhury 06/12/18
(Dr. Partho B. Choudhury)
Principal Scientist
Project Leader
CSIR-CIMFR
Nagpur Research Centre

6/12/18
(Dr. Abhay K. Soni)
Chief Scientist
Head of Research Group
CSIR-CIMFR
Nagpur Research Centre

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3	Observations	2
4	Blast Results	2
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6	Conclusions and recommendations	9

Acknowledgments

References

Annexure – I: Blast induced ground vibration & air overpressure event records

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2	Blast induced ground vibration and Air Overpressure	5
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Final Report on

Scientific investigations for design of controlled blasting pattern with SME explosives at Sasti Expansion opencast coal mine, Ballarpur Area of M/s Western Coalfields Limited

Executive Summary

M/s Western Coalfields Limited (WCL, Ballarpur Area) referred the study of investigation of recommending safe and productive blast design for conducting deep hole blasting by introducing site mixed emulsion explosive (vide WO No. WCL/BA/AGM/GM(O)/2017/303, dated 19.03.2018), to CSIR-Central Institute of Mining & Fuel Research, Nagpur Research Centre (Mining Technology).

Scientific investigations were carried out by CSIR-CIMFR Scientists to study the geological formations of the strata and design blasting patterns and further recommend safe blast design. The blasting events were monitored for ground vibrations and air over-pressure by seismographs of Instantel Make, Canada. Ground vibration and air over-pressure monitoring was done at different monitoring stations so as get the attenuation characteristics as well as the directional effect in different directions from the free face.

The following mathematical models were evolved for prediction of blast induced ground vibration at both 50% confidence (Equation i) and 84% confidence (Equation ii) for Sasti Expansion opencast coal mine, on the basis of scientific investigations;

At 50% confidence;

$$PPV = 1042\ (SD^{-1.514}) \quad \ldots\ldots\ldots\ldots\ldots\ldots (i)$$

At 84% confidence;

$$PPV = 2057.7\ (SD^{-1.514}) \quad \ldots\ldots\ldots\ldots\ldots\ldots (ii)$$

where, PPV is the peak vector sum (mm/sec)

SD is scaled distance; $D/Q^{0.5}$ for PPV

D is the distance (m) of vibration monitoring station from blast site

Q is the maximum charge per delay (kg)

The safe maximum charge per delay was calculated for various distances based on the above derived models. The report encompasses the recommendations, leading to successful use of site mixed emulsion with cast booster in Sasti Expansion opencast coal mine.

Final Report
on

SCIENTIFIC INVESTIGATIONS FOR DESIGN OF CONTROLLED BLASTING PATTERN WITH SME EXPLOSIVES AT SASTI EXPANSION OPENCAST COAL MINE, BALLARPUR AREA OF M/S WESTERN COADFIELDS LIMITED

M/s Western Coalfields Limited (WCL) referred the investigation of recommending safe blast design using site mixed emulsion (vide their WO No. WCL/BA/AGM/GM(O)/2017/303, dated 19.03.2018) at Sasti Expansion Opencast Coal mine to CSIR-Central Institute of Mining & Fuel Research (erstwhile CMRI), Nagpur Research Centre. Scientific investigations were conducted in the mine to study the blast design parameters. This report summarizes the information on different blasting events, different blast design and blast results alongwith suggestions to be implemented

1. Introduction

A team of CSIR-CIMFR Scientists visited Sasti expansion opencast coal mine of M/s Western Coalfields Limited (Ballarpur Area), to study the blasting scenario in details and monitor the blasting results. The team monitored ten blasting rounds (blasts) during the visit and collected data related to ground vibration, air over-pressure, throw and flyrock.

1a Location

The Sasti expansion opencast coal mine is located in Ballarpur Area of Western Coalfields Limited. The Sasti expansion opencast mine area falls in the Rajura Tehsil of Chandrapur district of Maharashtra state. The Chandrapur township is located at a distance of nearly 20km from the mine area. Sasti Expansion is adjacent to Sasti underground coal mine and old Sasti opencast mine workings.

2. Charging and seismograph installation

Blasting trials were conducted in different benches in different parts of the mine. Figure 1 provides an overview of Sasti Expansion opencast mine. Blasts were conducted with 159mm & 160 mm diameter drill holes (with available resources), charged with site mixed emulsion using shock tube / Nonel. Impetus of the study was to focus on designing safe blast design parameters using SME explosive. Blast design parameters were varied in the trial blasting rounds not only considering productivity and safety but also post blast effects.

Seismographs were fixed to the ground using plaster of paris at various monitoring stations to record blast induced ground vibration. Seismographs were installed at Sasti village inside a primary school (~1.8 km) and near temple (~1.5 km). Blast induced ground vibrations and air overpressure were also monitored on the adjoining road leading to Mahar village. Distances from the blasting face upto seismograph monitoring stations was measured using UTM co-ordinates, with the help of Garmin GPS eTrex 30x (Figure 2)

3. Observations

Blast induced ground vibration and air over-pressure were monitored at varying distances from 192m to nearly 1800m from the blast site. Seismographs installed in the nearest village measured vibration levels within permissible values of 5mm/s., whereas in some cases, those seismographs kept at large distances did not trigger i.e. had vibration levels less than trigger value of 0.49 mm/s. A total of ten blasting trial rounds were conducted. The blast design parameters of all ten blasts are presented in Table 1. In few instances seismographs were placed very near to the blasting area, as event records were needed to evaluate and generate attenuation data.

4. Blast Results

Ground vibration and air overpressure

Blast induced ground vibration and air over-pressure were monitored at maximum four different locations simultaneously with four seismographs, at different monitoring stations at varying distances from the blast site. All blast induced vibration event records are provided in Annexure I. The monitoring stations were fixed in such a way that the radial and directional attenuation characteristic of ground vibration could be ascertained. Observations of vibration and air overpressure is tabulated in Table 2.

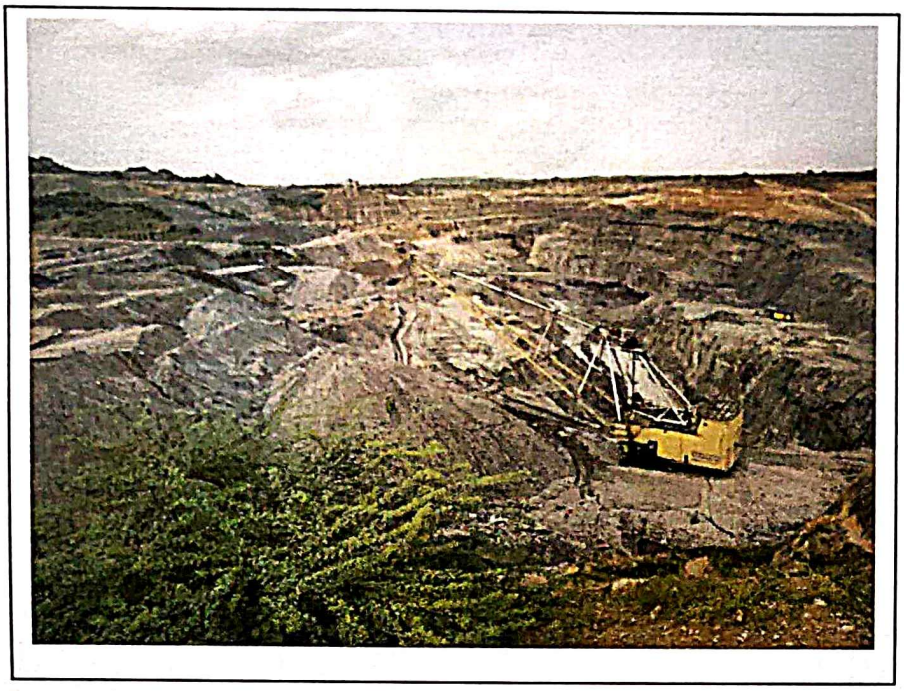


Figure 1. Overview of Sasti Expansion opencast coal mine

Figure 2. GPS location using Garmin eTrex 30x

Table 1. Blast design parameters

Hole Diameter : 159/160 mm
In-hole Initiation : Nonel / Shock tube
Surface Initiation : Nonel / Shock tube
Explosive : Site mixed emulsion and cast booster (100gms)

Blast No.	Date	Bench Location	Avg. Hole Depth (m)	No. of hole	Avg. B x S (m x m)	Avg. Stemming (m)	Avg. Charge / hole (kg)	Total Charge/ round (kg)	Sp. Charge (kg/m^3)
B1	10/8/17	HOE OB Bench	5.9	83	4 x 4.5	3.0	51.0	4231	0.48
B2	10/8/17	HOE OB Bench	6.0	73	4.5 x 5	3.0	60.73	4434	0.45
B3	11/8/17	HOE OB Bench	5.5	91	4 x 4.5	3.25	42.57	3874	0.43
B4	3/12/17	HOE OB Bench	6.0	89	4 x 4.5	3.0	48.6	4325	0.45
B5	5/12/17	HOE OB Bench	5.5	191	4.5 x5	3.25	56.0	10690	0.45
B6	8/12/17	HOE OB Bench	6.0	188	4.5 x 5	3.25	64.14	12060	0.48
B7	8/12/17	HOE OB Bench	6.0	148	4.5 x 5	3.25	59.32	8780	0.44
B8	11/12/17	HOE OB Bench 2	6.0	85	4.5 x 4.5	3.5	55.0	4675	0.45
B9	11/12/17	HOE OB Bench 3	6.0	150	4.5 x 4.5	3.5	55.0	8225	0.45
B10	27/12/17	HOE OB Bench	6.0	32	4.5 x 4.5	3.5	55.0	1760	0.45
Total Explosive Charge in all trials (kg)								**63054**	--

Table 2. Blast induced ground vibration (PVS) and Air Overpressure (AOP)

Blast No.	Max. Explosive Charge per delay (kg)	Seismograph distance from blast (m)	Peak Vector Sum (mm/s)	Dominant Frequency (Hz)	Air Overpressure (dBL)	Seismograph location
1	204	1804	1.231	2.875	109.5	In Primary school in village
		430	3.558	42	<88	In mine – near dragline
		1650	1.046	2	108.2	On road going to Mathar village
		1781	1.198	6.7	109.2	Adjacent to Temple in village
2	122	1750	<0.5	Did not trigger / record		In Primary school in village
		1550	<0.5	Did not trigger / record		Adjacent to Temple in village
3	170.28	472	11.4	2.7	134.5	In mine – near dragline
		192	25.68*	2.813	136	In mine – on blasting bench
		1100	3.7	12.5	95.9	Adjacent to Temple in village
		1435	2.024	6.75	91.5	In Primary school in village
4	194.4	1500	2.376	5.875	113.1	Inside Sasti village
5	112	381	14.1	4.625	129.1	In mine area
		390	11.16	4.25	127.7	In mine area
		320	12.24	3.125	129.9	In mine area
6	64.14	456	3.594	7.125	119.7	In mine area
7	118.64	440	2.94	3.875	142.6	In mine area
8	110	654	1.465	4.625	112.3	In mine area
9	165	400	4.344	4.5	140.2	In mine area
10	165	1772	0.568	2	120.9	In Primary school in village
		1100	1.152	4.75	121.4	Near temple in village

*** Seismograph (Blaster Serial No.UM7271) were deliberately kept very near to the blasting site, to enable it to record near-filed event.**

5. Analysis

Fast Fourier Transform analysis (Fig. 3) of the ground vibration data in general indicates that the dominant ground vibration frequency in most of the cases is below 8 Hz.

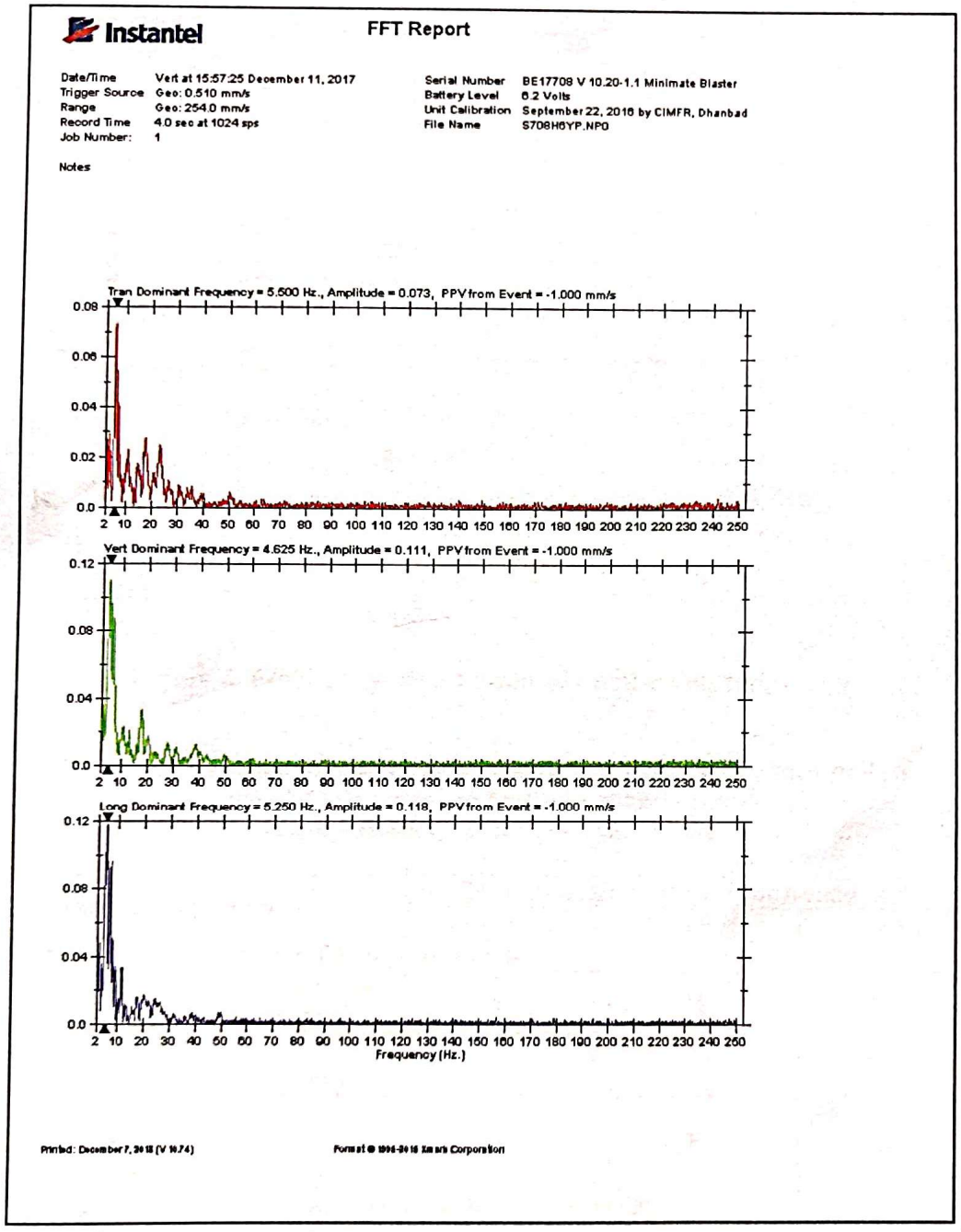


Figure 3. FFT analysis of vibration data from Blast No.8

The permissible PPV (Peak particle velocity) as per DGMS circular No.7 dt.29/08/97 (Table 3) for domestic houses/structures (Kuccha, brick and cement) is 5 mm/s, as majority of the ground vibration events have dominating frequency below 8Hz (Fig.4). The safe air over-

pressure has been considered as 128dBL, as per recommendations of Siskind & Summers (Bhandari, 1994).

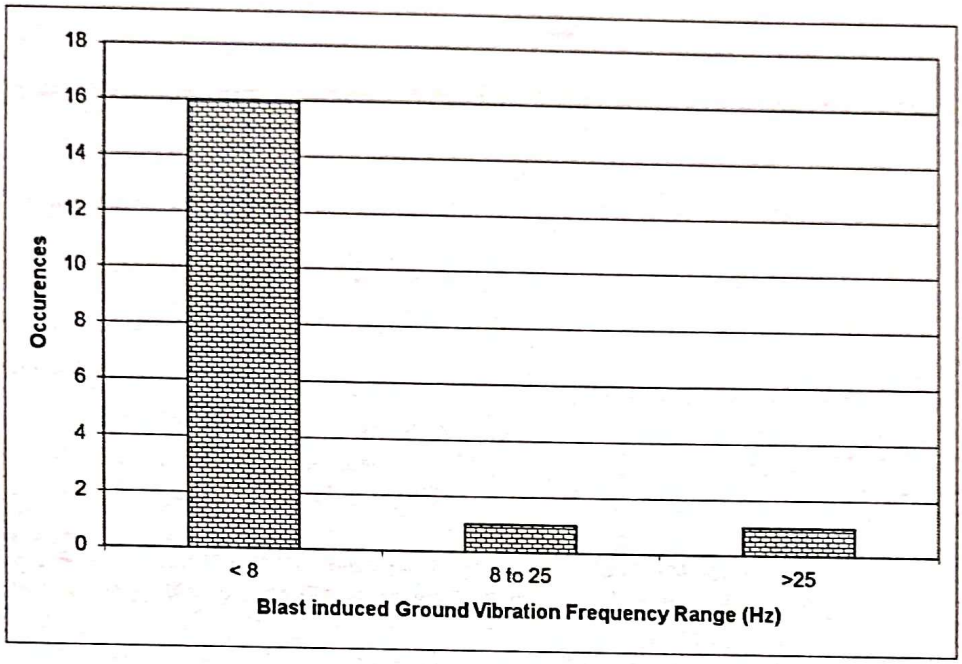


Figure 4. Frequency distribution of dominating frequency

Table 3. Permissible Peak Particle Velocity (PPV) at the foundation level of structures in Mining Areas in mm/s (as per DGMS Circular No.7 dt.29/08/97)

Type of Structure	Dominant Excitation Frequency, Hz		
	< 8 Hz	*8 - 25 Hz*	*> 25 Hz*
(A) Buildings / structures not belong to owner			
(i) Domestic houses / structures (Kuchha, brick & cement)	5	10	15
(ii) Industrial Buildings (RCC & Framed Structures)	10	20	25
(iii) Objects of historical Importance & sensitive Structures	2	5	10
(B) Buildings belonging to owner with limited span of life			
(i) Domestic houses / structures (Kuchha, brick & cement)	10	15	25
(ii) Industrial buildings (RCC & framed structures)	15	25	50

Regression analysis was done for data acquired from all the blasting rounds, taking into account blast induced ground vibration (Figure 5). Air overpressure in most of the cases is well within permissible values of 128dBL, except where seismographs are kept very near to the blasting area.

The attenuation equation obtained after analysis of data for Sasti Expansion opencast coal mine is;

For Ground Vibration;

At 50% Confidence; $PPV = 1042\ (SD^{-1.514})$ --------(i)

At 84% Confidence; $PPV = 2057.7\ (SD^{-1.514})$ --------(ii)

where,

PPV = Peak Vector Sum in mm/s
SD = Scaled Distance
= $(D/Q^{1/2})$ for Ground Vibration

D = Distance of seismograph from blast site in m;
Q = Maximum Explosive Charge (MCD) per delay in kg

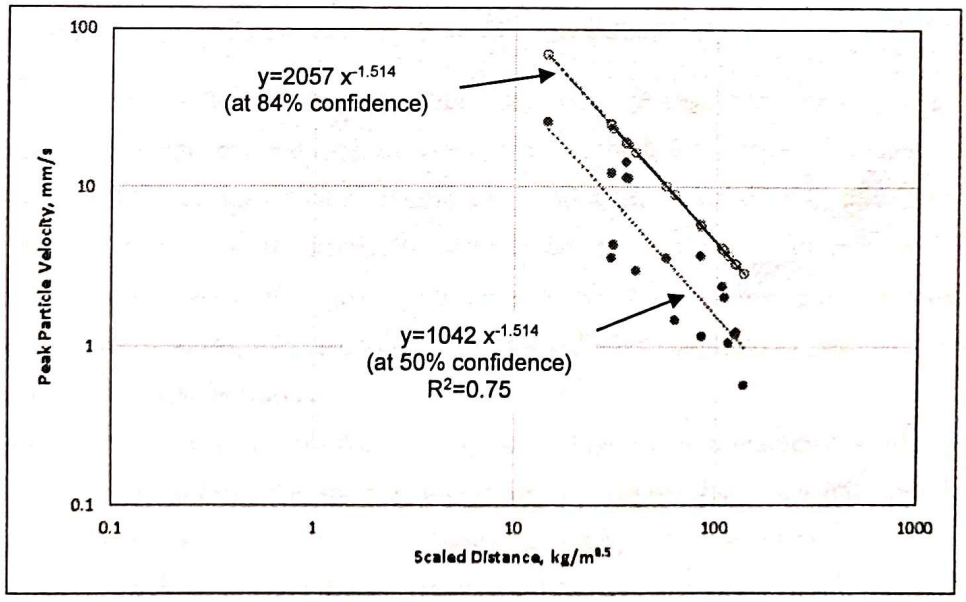


Figure 5. Vibration attenuation curve of Sasti Expansion Opencast Coal mine

Ground vibration analysis was done using both 50% confidence and at 84% confidence limits.

Based on Equations i and ii above, the following maximum safe charge per delay has been calculated (refer Table 4) from the attenuation characteristics, for the existing ground conditions.

Table 4. Calculated maximum safe charge (MCD) per delay at 84% confidence

Distance of blast site from nearest structure, m	Calculated Maximum charge per delay, kgs
	Based on safe permissible ground vibration levels of 5mm/s (for <8Hz)
300	31.66
400	56.29
500	87.29
600	126.0
700	172

6. Conclusions & Recommendations

The following points require consideration and adherence when blasting is conducted using site mixed emulsion in combination with cast booster;

a) The theoretical permissible maximum explosive charge per delay (as is obtained from site specific ground attenuation curve) for Sasti Expansion opencast coal mine, should not be exceeded when blasting is conducted at distance as specified in Table 4 above. In the present scenario, habitats are at distance of more than 500m from blasting area. Maximum explosive charge per hole in the present studies was maximum 64.14 kg, hence using appropriate delays can help in restricting maximum charge per delay in future.

b) The explosive charge per hole may be varied keeping in consideration the rock mass properties of different formations. It can also be varied with changing hole depth and hole diameter, keeping maximum charge per delay in line with Equation ii.

c) In the present scenario, villages are located at plan distances of more than 1km and blast induced ground vibration levels are very much within permissible value of 5mm/s.

d) Secondary blasting / boulder blasting, if conducted should be done separately from the production / main blast and should not be in conjunction with the production / main blasting round.

e) Blasting face should be as far as possible maintained along the strike direction. This would help in improving the fragmentation, reducing throw and obtaining a better muck profile

f) Systematic & proper drilling of holes is to be maintained, to get desired spacing and burden.

g) Stemming should be more than or at least equal to the average drilled burden.

h) Maximum three row blasting is recommended at a distance of around 250m from structures.

i) Top of the face should be cleaned for any debris. The face should be cleared of muck of the previous blast

j) The free face direction should be as far as possible, away from the hutments/ structures (temporary or permanent)

k) Analysis of data reveals that SME and cast booster can be implemented in Sasti Expansion opencast mine and blasting may be done using the blast design and charging pattern tabulated in Table 5 and also as illustrated in Figure 6 below:

Table 5. Recommended blast design (400m to 500m)

Planned maximum explosive charge per delay : 64 kg

Maximum vibration limit : 5 mm/s (at more than 300m)

Hole Diameter: 159/160 mm
Drilling Pattern: Staggered (preferably)
Hole Direction: Vertical
Initiation Front: Away from structures or hutments, if any
Initiation Type: Bottom hole initiation with non-electric initiation
Surface trunk: Noiseless trunk line (Nonel/shock tube)
Explosive Type: Site mixed emulsion (SME) & Cast Booster

Parameters	Values
Maximum holes / round	190
Number of rows	05
Average Hole depth, m	6.0
Average Spacing, m	4.5
Average Drill Burden, m	4.0
Avg. Stemming, m	3.25
Maximum charge / delay, kg	64
Maximum permissible peak particle velocity near structure foundation, mm/s	5

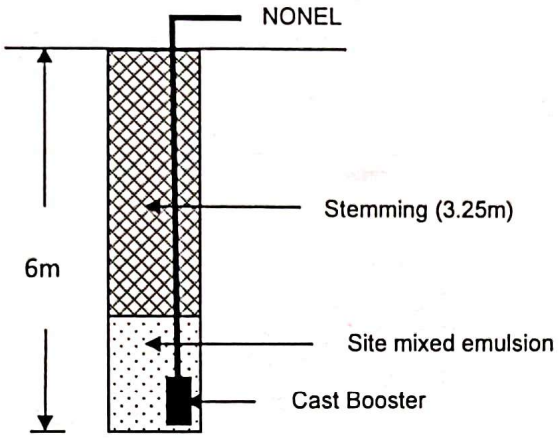


Figure 6. Recommended Blast Design *(Not to scale)*

Acknowledgement

Scientists of CSIR-Central Institute of Mining and Fuel Research are thankful to the management and officials of M/s Western Coalfields Limited (WCL) for their kind help and co-operation extended during the course of the investigations.

References:

1) DGMS Circular No. DGMS (Tech) / (S&T) No.7 of 1997 dated 29/08/1997
2) Dowding C. H. (1985), Blast vibration monitoring, Prentice Hall Inc., USA
3) Lopex Jimeno C., Lopez Jimeno E., Carcedo F. J. A. and De Ramiro, Y. V.(1995), Drilling and blasting of rocks, Balkema A. A., Rotterdam
4) Bhandari S., "Air overpressure due to blasting and its control", Proceedings of International Conference on Environmental issues in Minerals and Energy industry, New Delhi, 24-26 Oct, pp.300-307.

ANNEXURE – 1

BLAST INDUCED GROUND VIBRATION AND AIR OVERPRESSURE EVENT RECORDS

Instantel

Event Report

Date/Time	Tran at 15:44:56 August 10, 2017
Trigger Source	Geo: 0.500 mm/s
Range	Geo: 254.0 mm/s
Record Time	4.312 sec (Auto=4Sec) at 1024 sps
Job Number:	2
Operator/Setup:	Operator/factory N.MMB

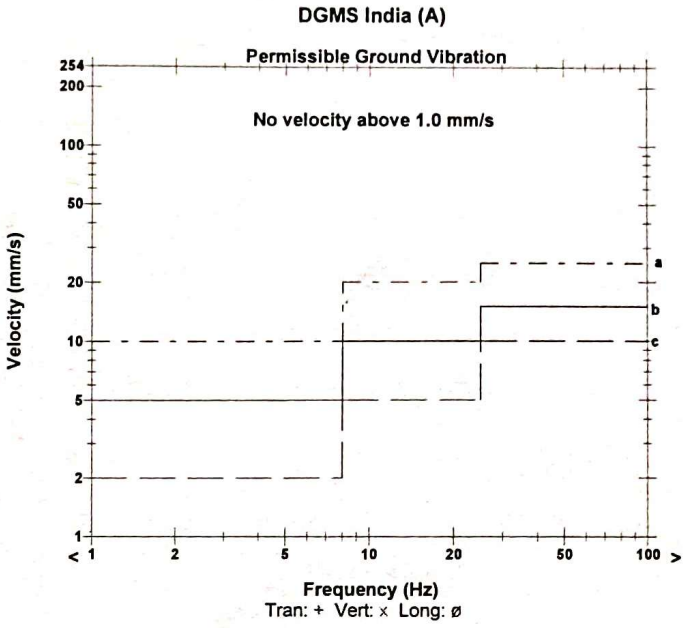
Serial Number	UM7271 V 10-75 Micromate ISEE
Battery Level	3.8 Volts
Unit Calibration	April 24, 2015 by Instantel
File Name	UM7271_20170810154456.IDFW

Notes
Location:
Client:
User Name: CSIR-CIMFR
General:

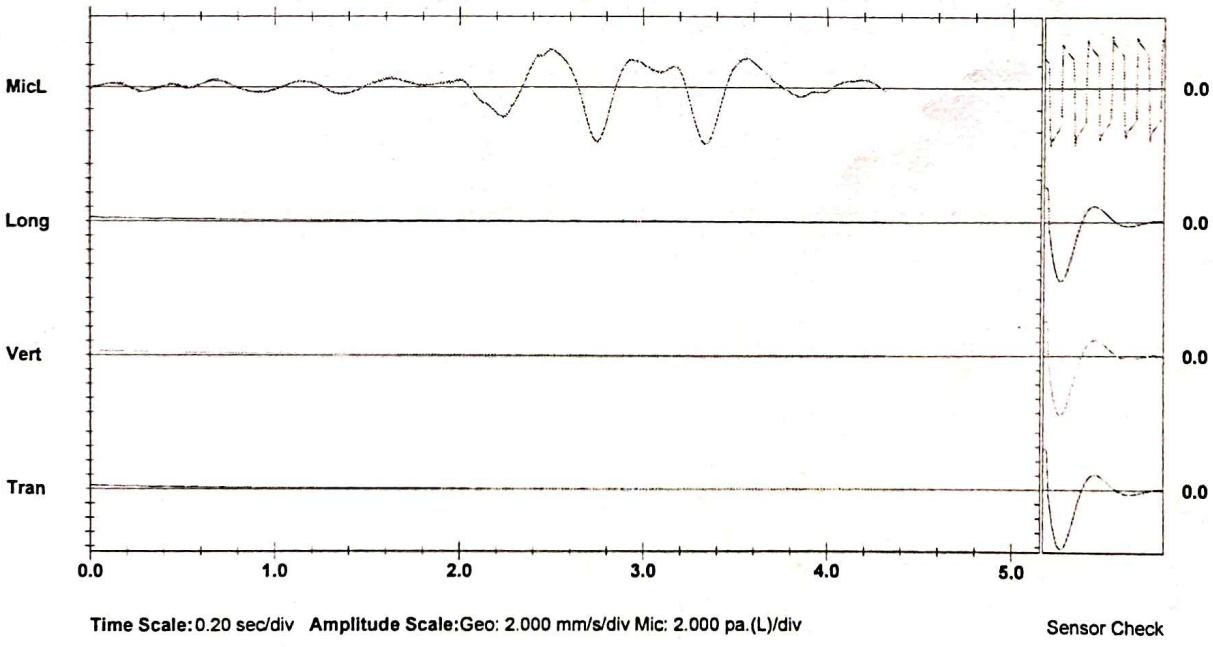
Microphone	Linear Weighting
PSPL	108.2 dB(L) 5.151 pa.(L) at 3.331 sec
ZC Freq	2.3 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 1249 mv)

	Tran	Vert	Long	
PPV	0.567	0.678	0.583	mm/s
PPV	46.08	47.62	46.32	dB
ZC Freq	N/A	N/A	N/A	Hz
Time (Rel. to Trig)	0.000	0.000	0.004	sec
Peak Acceleration	0.021	0.007	0.042	g
Peak Displacement	0.219	0.000	0.265	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	3.8	3.7	3.6	

Peak Vector Sum 1.046 mm/s at 0.000 sec
N/A: Not Applicable



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 2.000 pa.(L)/div

Sensor Check

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Instantel

Event Report

Date/Time	Vert at 15:57:30 August 10, 2017
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254.0 mm/s
Record Time	3.75 sec (Auto=3Sec) at 1024 sps
Job Number:	1

Serial Number	BE17446 V 10.60-1.1 Minimate Blaster
Battery Level	6.1 Volts
Unit Calibration	July 13, 2017 by CIMFR Dhanbad
File Name	S446H0MX.NU0

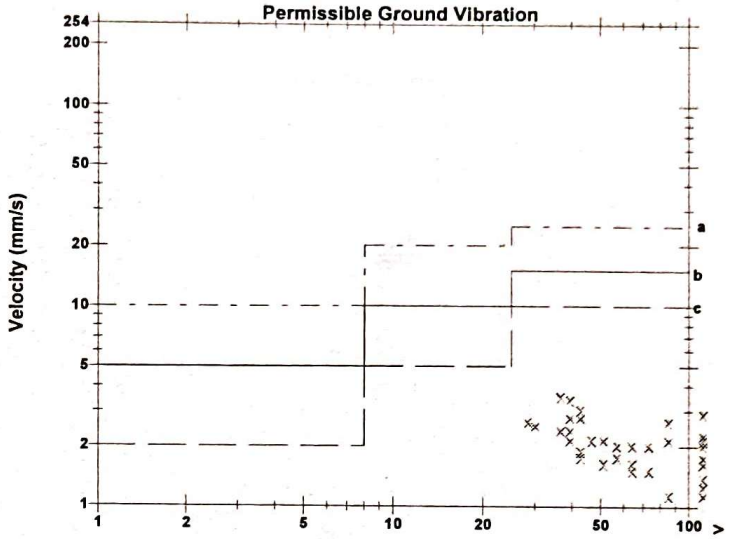
Notes

Microphone	Linear Weighting
PSPL	<88 dB(L) 0.500 pa.(L) at 0.073 sec
ZC Freq	>100 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 422 mv)

	Tran	Vert	Long	
PPV	0.254	3.556	0.127	mm/s
PPV	39.10	62.02	33.08	dB
ZC Freq	>100	37	>100	Hz
Time (Rel. to Trig)	0.074	0.022	-0.249	sec
Peak Acceleration	0.013	0.371	0.027	g
Peak Displacement	0.000	0.013	0.000	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.1	7.4	7.7	Hz
Overswing Ratio	3.2	4.0	3.7	

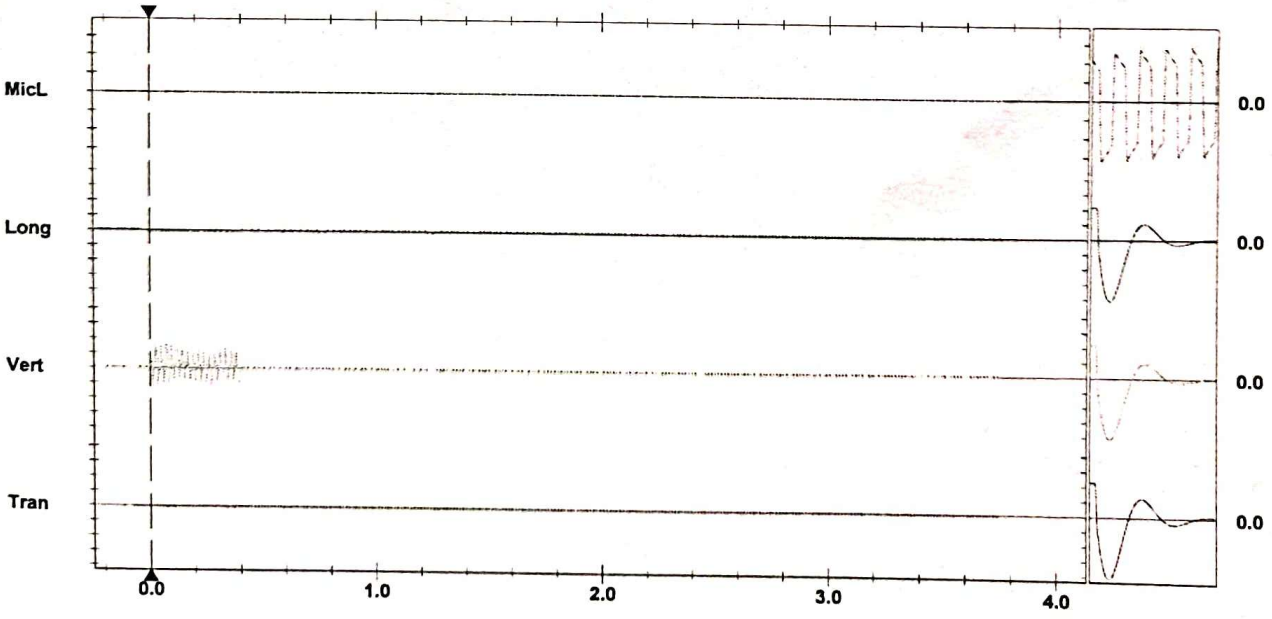
Peak Vector Sum 3.558 mm/s at 0.022 sec

DGMS India (A)



Frequency (Hz)
Tran: + Vert: x Long: ø

a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶—— ——◀

Sensor Check

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Instantel

Event Report

Date/Time	Tran at 15:47:35 August 10, 2017
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254.0 mm/s
Record Time	4.0 sec at 1024 sps
Job Number:	1

Serial Number	BE17708 V 10.20-1.1 Minimate Blaster
Battery Level	6.2 Volts
Unit Calibration	September 22, 2016 by CIMFR, Dhanbad
File Name	S708H0MX.7B0

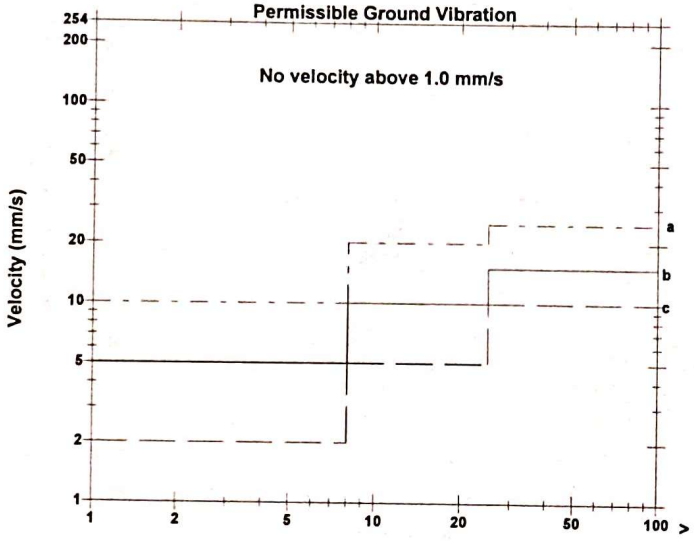
Notes

Microphone	Linear Weighting
PSPL	109.5 dB(L) 6.000 pa.(L) at 1.338 sec
ZC Freq	34 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 445 mv)

	Tran	Vert	Long	
PPV	0.762	0.889	0.381	mm/s
PPV	48.64	49.98	42.62	dB
ZC Freq	>100	85	>100	Hz
Time (Rel. to Trig)	0.001	0.001	0.000	sec
Peak Acceleration	0.053	0.040	0.027	g
Peak Displacement	0.001	0.005	0.000	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.4	7.5	Hz
Overswing Ratio	3.8	3.8	3.8	

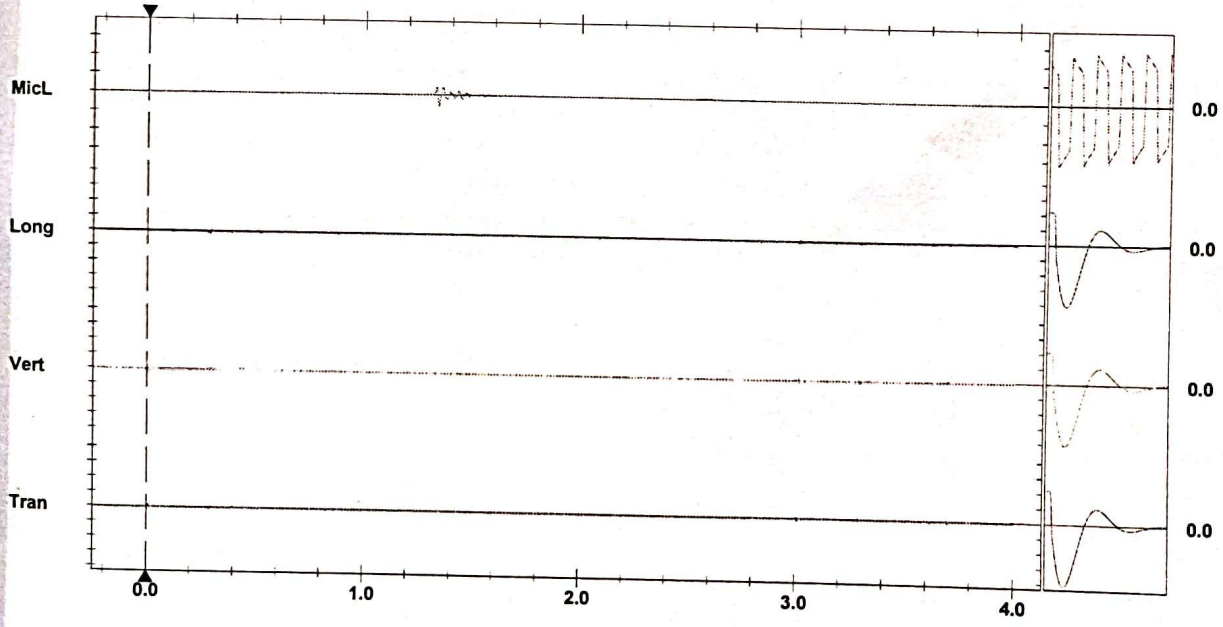
Peak Vector Sum 1.231 mm/s at 0.001 sec

DGMS India (A)



Frequency (Hz)
Tran: + Vert: x Long: ø

a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶— —◀

Sensor Check

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Instantel

Event Report

Date/Time	Vert at 15:37:25 August 10, 2017
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254.0 mm/s
Record Time	4.0 sec at 1024 sps
Job Number:	2

Serial Number	BE17806 V 10.60-8.17 MiniMate Plus/8
Battery Level	6.1 Volts
Unit Calibration	September 22, 2016 by CIMFR, Dhanbad
File Name	S806H0MW.QD0

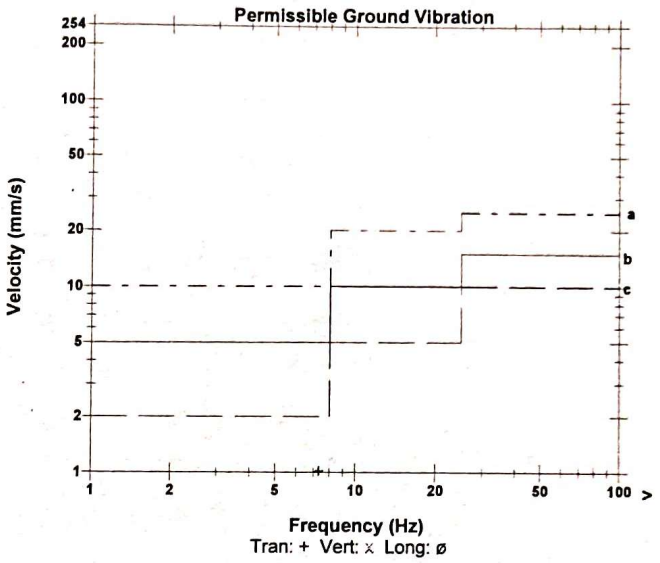
Notes

Microphone	Linear Weighting
PSPL	109.2 dB(L) 5.750 pa.(L) at 3.292 sec
ZC Freq	3.6 Hz
Channel Test	Disabled

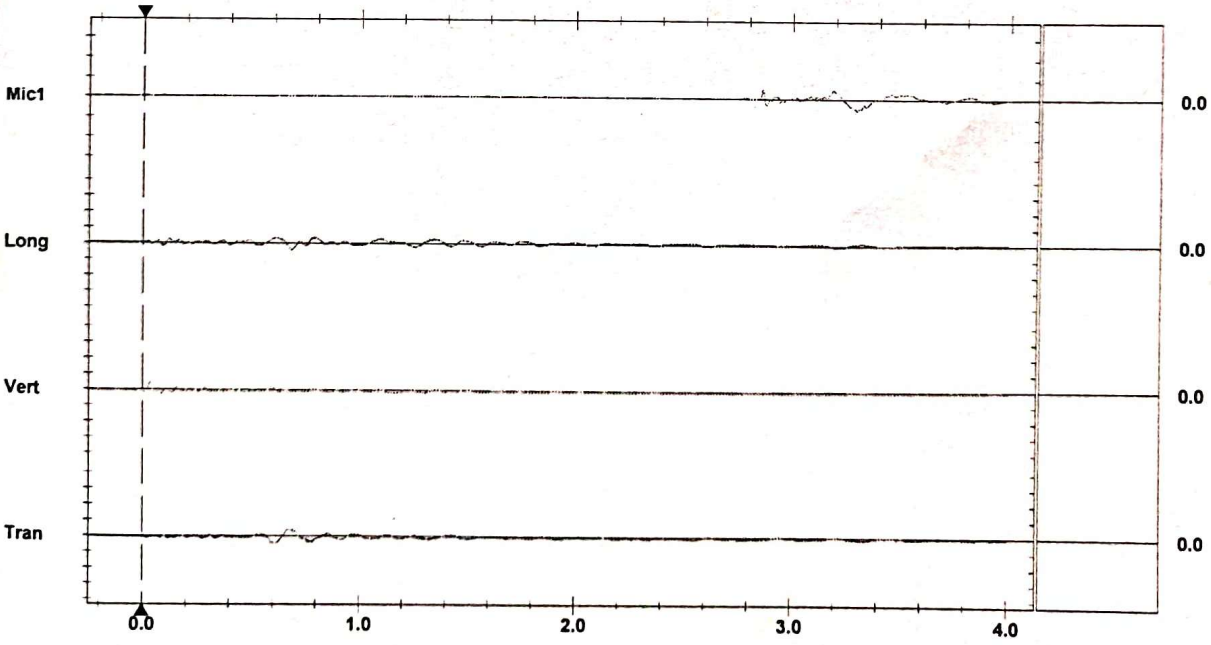
	Tran	Vert	Long	
PPV	1.016	0.889	0.889	mm/s
PPV	51.14	49.98	49.98	dB
ZC Freq	7.3	27	11	Hz
Time (Rel. to Trig)	0.611	0.033	0.683	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.023	0.009	0.018	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 1.198 mm/s at 0.611 sec

DGMS India (A)



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶—— ——◀

Sensor Check

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Instantel

Event Report

Date/Time	Vert at 16:05:05 August 11, 2017
Trigger Source	Geo: 0.500 mm/s
Range	Geo: 254.0 mm/s
Record Time	10.148 sec (Auto=4Sec) at 1024 sps
Job Number:	2
Operator/Setup:	Operator/factory N.MMB

Serial Number	UM7271 V 10-75 Micromate ISEE
Battery Level	3.8 Volts
Unit Calibration	April 24, 2015 by Instantel
File Name	UM7271_20170811160505.IDFW

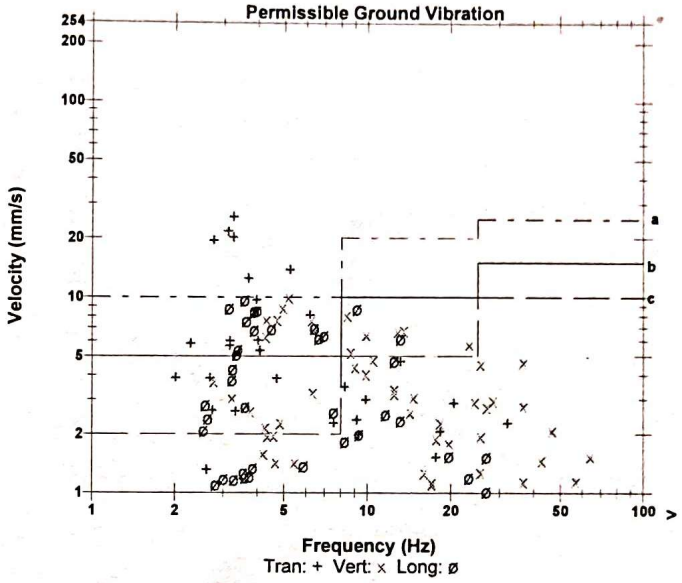
Notes
Location:
Client:
User Name: CSIR-CIMFR
General:

Microphone	Linear Weighting
PSPL	136.0 dB(L) 125.5 pa.(L) at 1.699 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 1130 mv)

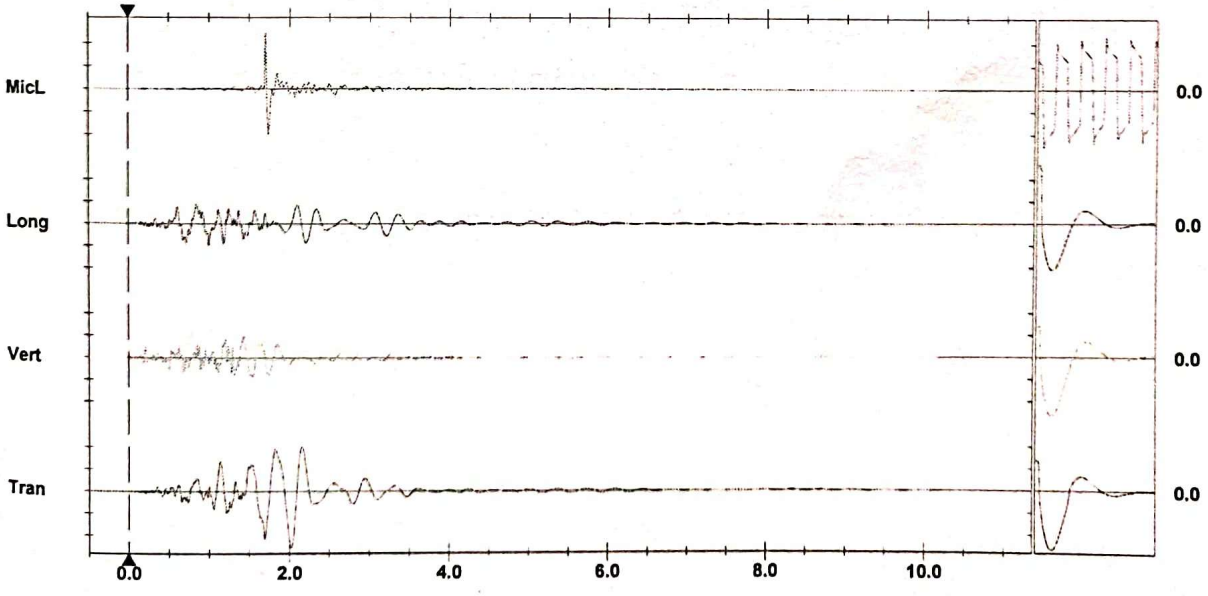
	Tran	Vert	Long	
PPV	25.61	9.955	9.647	mm/s
PPV	79.17	70.96	70.69	dB
ZC Freq	3.2	5.2	3.6	Hz
Time (Rel. to Trig)	2.023	1.442	1.007	sec
Peak Acceleration	0.109	0.169	0.118	g
Peak Displacement	1.200	0.306	0.382	mm
Sensor Check	Passed	Passed	Check	
Frequency	8.2	7.5	7.9	Hz
Overswing Ratio	4.0	3.7	3.4	

Peak Vector Sum 25.68 mm/s at 2.021 sec

DGMS India (A)



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 10.000 mm/s/div Mic: 50.00 pa.(L)/div
Trigger = ▶—— ——◀

Sensor Check

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Instantel

Event Report

Date/Time	Vert at 16:05:53 August 11, 2017
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254.0 mm/s
Record Time	10.25 sec (Auto=3Sec) at 1024 sps
Job Number:	1

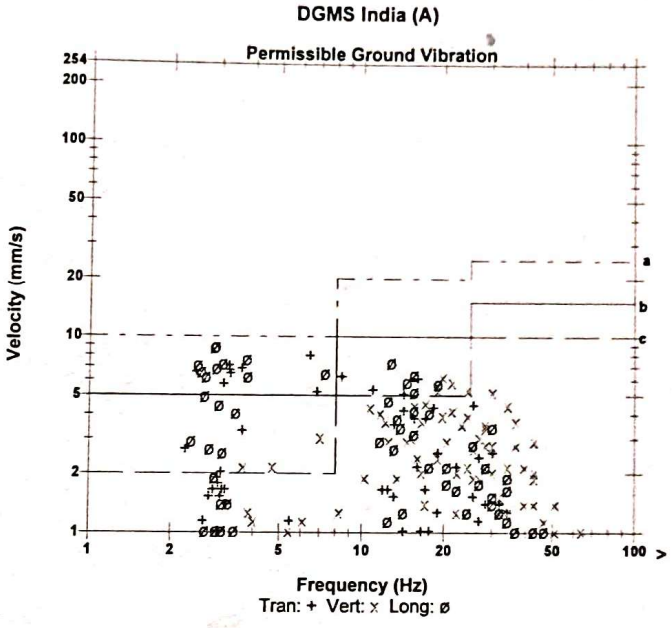
Notes

Serial Number	BE17446 V 10.60-1.1 Minimate Blaster
Battery Level	6.1 Volts
Unit Calibration	July 13, 2017 by CIMFR Dhanbad
File Name	S446H0OS.PT0

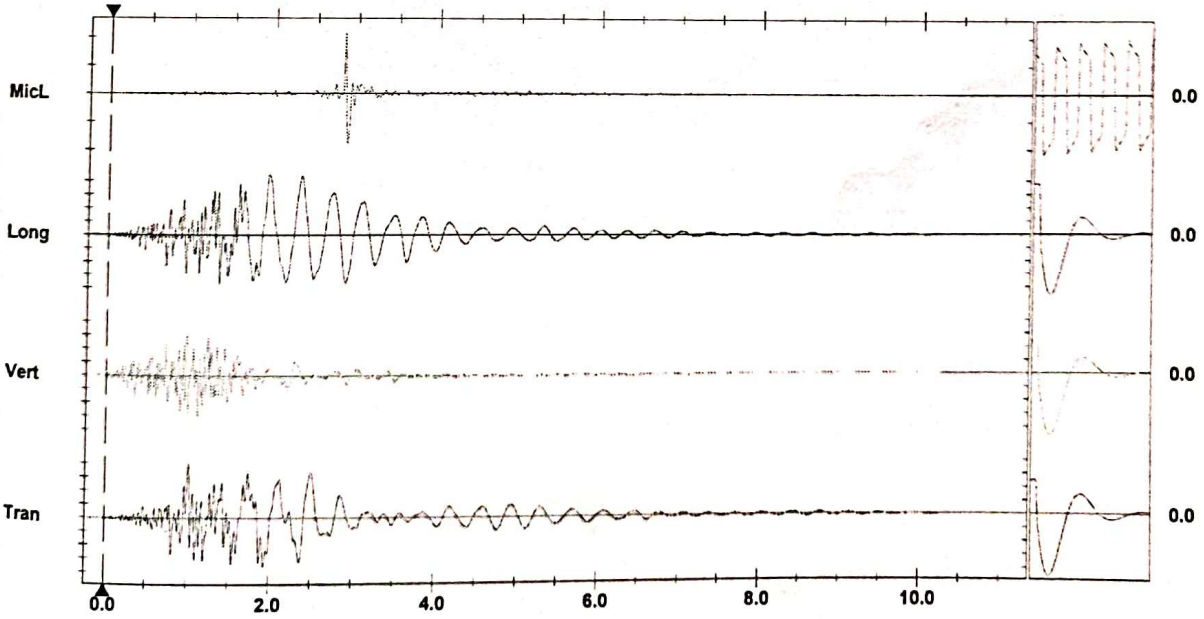
Microphone	Linear Weighting
PSPL	134.5 dB(L) 106.8 pa.(L) at 2.834 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 435 mv)

	Tran	Vert	Long	
PPV	8.001	6.223	8.890	mm/s
PPV	69.06	66.88	69.98	dB
ZC Freq	6.4	20	2.9	Hz
Time (Rel. to Trig)	1.018	0.978	1.940	sec
Peak Acceleration	0.080	0.119	0.093	g
Peak Displacement	0.357	0.081	0.446	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.4	7.8	Hz
Overswing Ratio	3.2	4.0	3.6	

Peak Vector Sum 11.40 mm/s at 1.940 sec



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 2.000 mm/s/div Mic: 50.00 pa.(L)/div Sensor Check

Trigger = ▶— —◀

Printed: December 6, 2018 (V 10.74)

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Instantel

Event Report

Date/Time	Vert at 16:04:06 August 11, 2017
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254.0 mm/s
Record Time	4.0 sec at 1024 sps
Job Number:	2

Notes

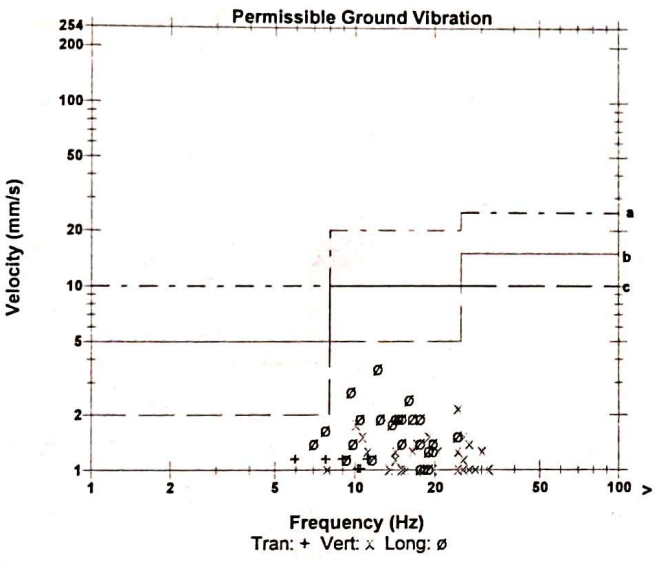
Serial Number	BE17806 V 10.60-8.17 MiniMate Plus/8
Battery Level	6.1 Volts
Unit Calibration	September 22, 2016 by CIMFR, Dhanbad
File Name	S806H0OS.MU0

Microphone	Linear Weighting
PSPL	95.9 dB(L) 1.250 pa.(L) at 1.456 sec
ZC Freq	14 Hz
Channel Test	Disabled

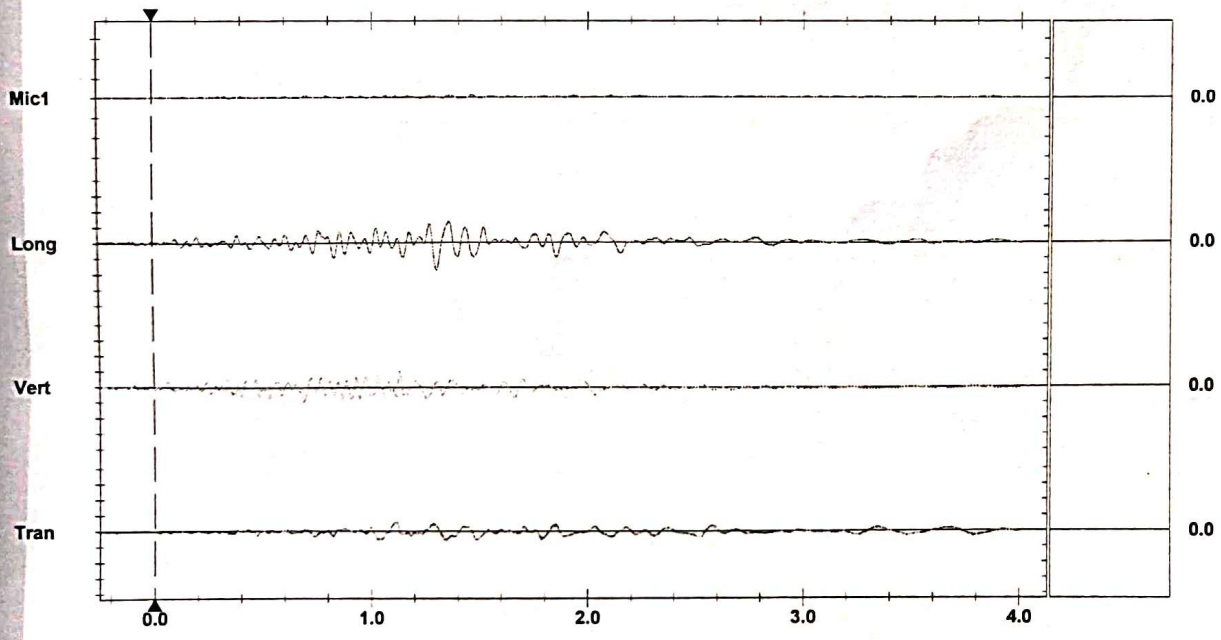
	Tran	Vert	Long	
PPV	1.143	2.159	3.556	mm/s
PPV	52.16	57.69	62.02	dB
ZC Freq	7.8	24	12	Hz
Time (Rel. to Trig)	1.033	1.131	1.298	sec
Peak Acceleration	0.027	0.053	0.053	g
Peak Displacement	0.029	0.023	0.044	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

Peak Vector Sum 3.700 mm/s at 1.298 sec

DGMS India (A)



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check

Trigger =

Printed: December 6, 2018 (V 10.74)

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Instantel

Event Report

Date/Time	Vert at 16:04:38 December 3, 2017
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254.0 mm/s
Record Time	4.25 sec (Auto=3Sec) at 1024 sps
Job Number:	1

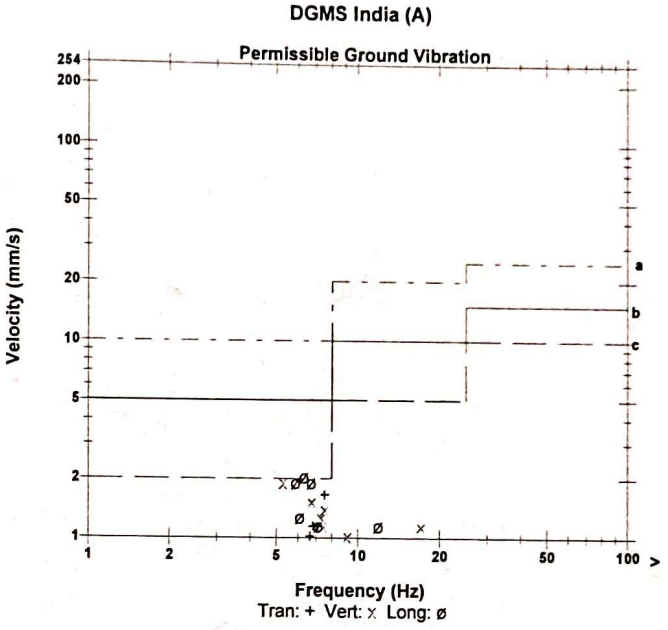
Notes

Serial Number	BE17446 V 10.60-1.1 Minimate Blaster
Battery Level	6.1 Volts
Unit Calibration	July 13, 2017 by CIMFR Dhanbad
File Name	S446H6JW.NQ0

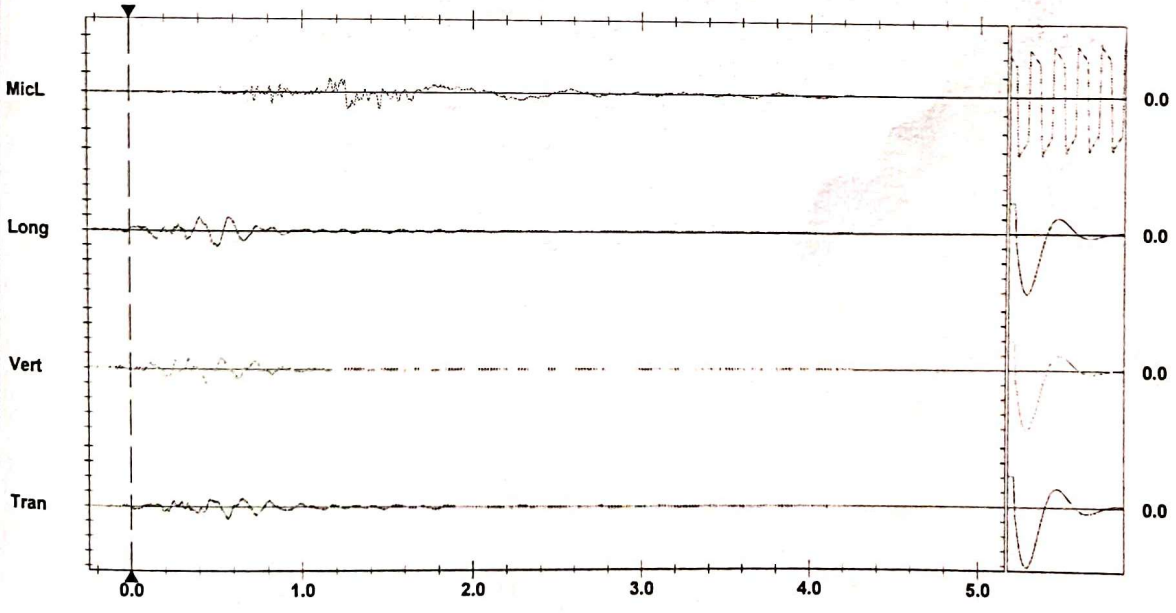
Microphone	Linear Weighting
PSPL	113.1 dB(L) 9.000 pa.(L) at 1.266 sec
ZC Freq	4.7 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 444 mv)

	Tran	Vert	Long	
PPV	1.651	1.905	2.032	mm/s
PPV	55.35	56.60	57.16	dB
ZC Freq	7.5	5.3	6.3	Hz
Time (Rel. to Trig)	0.565	0.444	0.512	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.032	0.045	0.055	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.3	7.5	Hz
Overswing Ratio	3.3	4.1	3.8	

Peak Vector Sum 2.376 mm/s at 0.575 sec



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div

Trigger = ▶—— ——◀

Sensor Check

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Instantel

Event Report

Date/Time	Vert at 16:06:30 December 5, 2017
Trigger Source	Geo: 0.500 mm/s
Range	Geo: 254.0 mm/s
Record Time	6.562 sec (Auto=4Sec) at 2048 sps
Job Number:	1
Operator/Setup:	Operator/factory.MMB

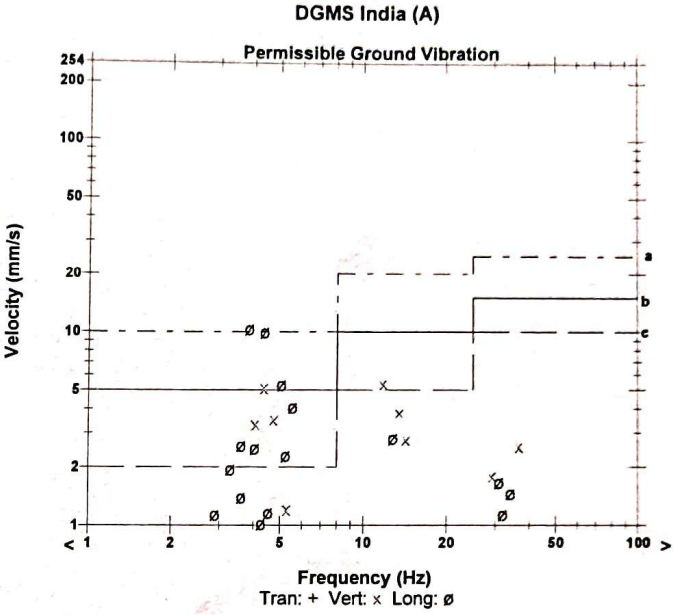
Serial Number	UM7270 V 10-75 Micromate ISEE
Battery Level	3.8 Volts
Unit Calibration	April 24, 2015 by Instantel
File Name	UM7270_20171205160630.IDFW

Notes
Location:
Client:
User Name:
General:

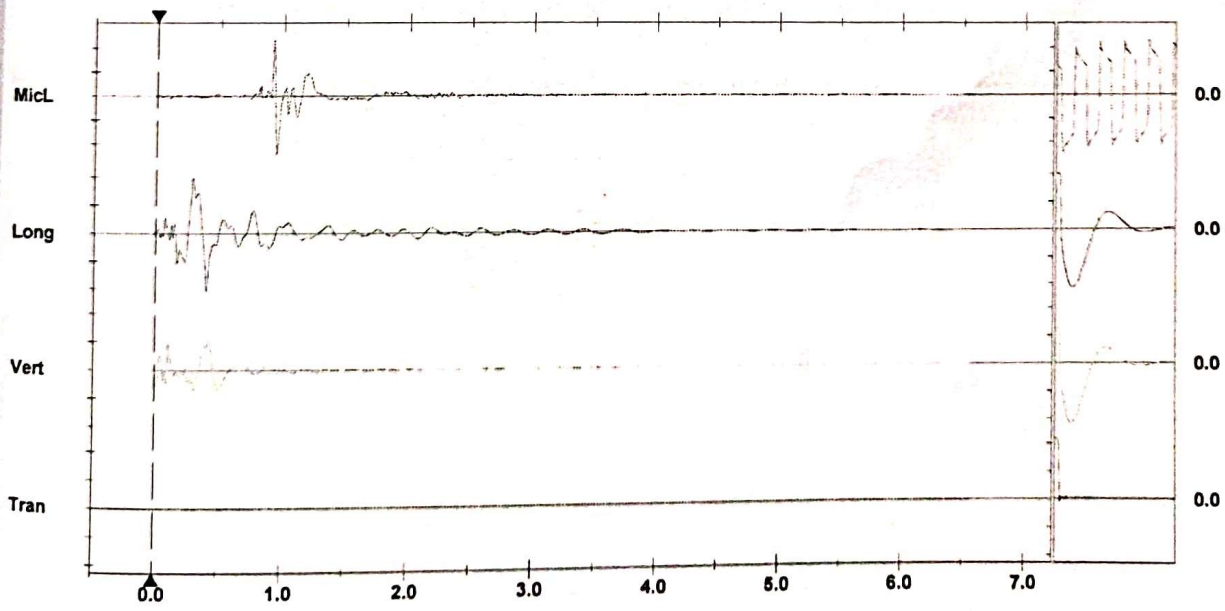
Microphone	Linear Weighting
PSPL	127.7 dB(L) 48.41 pa.(L) at 0.951 sec
ZC Freq	8.5 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 1215 mv)

	Tran	Vert	Long	
PPV	0.079	5.368	10.33	mm/s
PPV	28.93	65.60	71.28	dB
ZC Freq	2.9	11.8	3.8	Hz
Time (Rel. to Trig)	2.524	0.108	0.405	sec
Peak Acceleration	0.010	0.146	0.067	g
Peak Displacement	0.010	0.191	0.329	mm
Sensor Check	Check	Passed	Passed	
Frequency	1024.0	7.5	7.3	Hz
Overswing Ratio	0.0	3.8	3.5	

Peak Vector Sum 11.16 mm/s at 0.405 sec



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 5.000 mm/s/div Mic: 20.00 pa.(L)/div Sensor Check
Trigger = ▶— —◀

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Instantel

Event Report

Date/Time	Vert at 16:05:16 December 5, 2017
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254.0 mm/s
Record Time	4.0 sec at 1024 sps
Job Number:	1

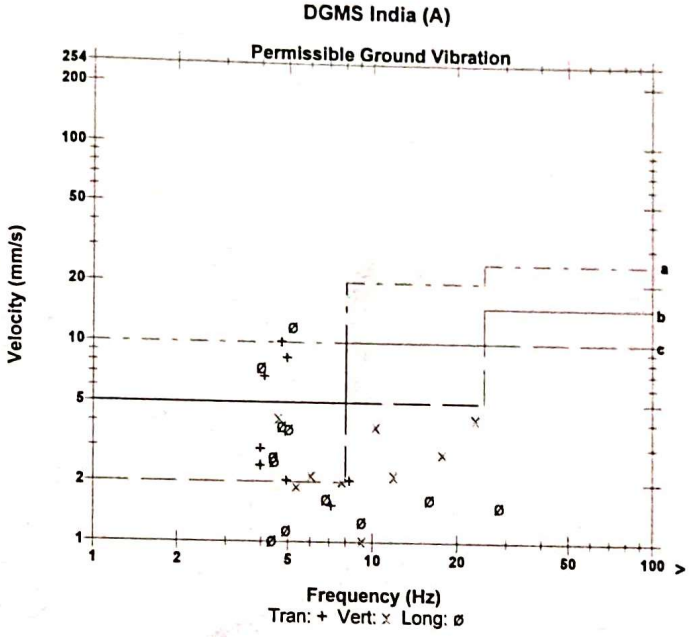
Serial Number	BE17708 V 10.20-1.1 Minimate Blaster
Battery Level	6.1 Volts
Unit Calibration	September 22, 2016 by CIMFR, Dhanbad
File Name	S708H6NM.0S0

Notes

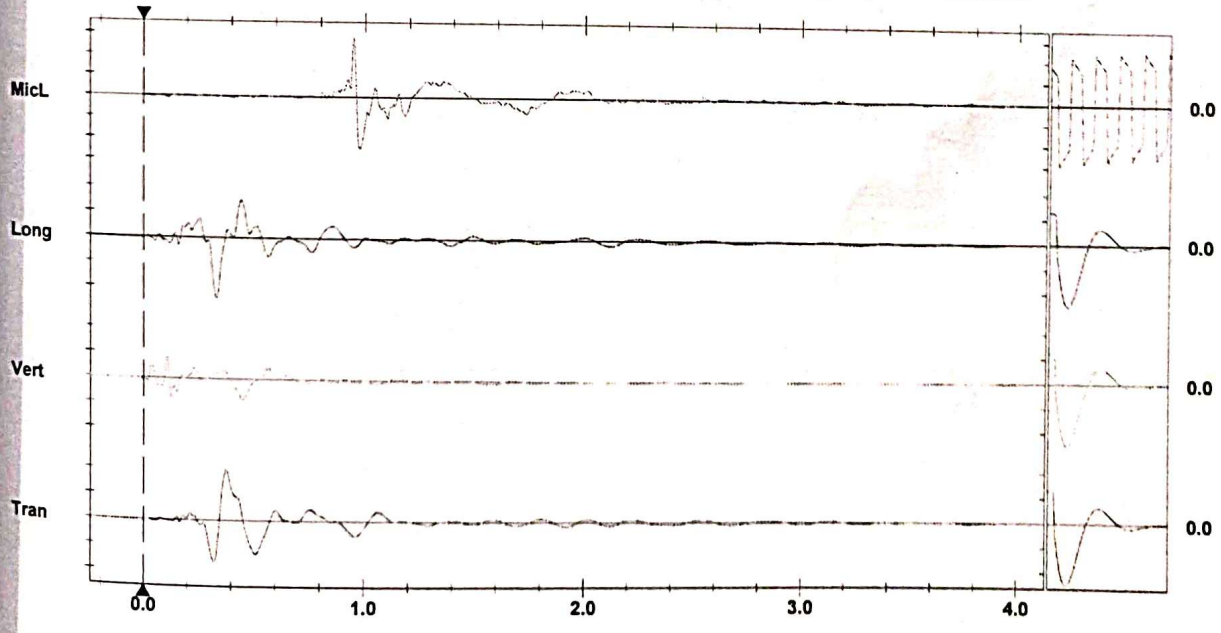
Microphone	Linear Weighting
PSPL	129.1 dB(L) 56.75 pa.(L) at 0.948 sec
ZC Freq	4.5 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 485 mv)

	Tran	Vert	Long	
PPV	10.03	4.191	11.94	mm/s
PPV	71.03	63.45	72.54	dB
ZC Freq	4.7	23	5.2	Hz
Time (Rel. to Trig)	0.376	0.108	0.332	sec
Peak Acceleration	0.066	0.080	0.066	g
Peak Displacement	0.305	0.120	0.245	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.4	7.5	Hz
Overswing Ratio	3.8	3.8	3.8	

Peak Vector Sum 14.10 mm/s at 0.328 sec



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 5.000 mm/s/div Mic: 20.00 pa.(L)/div Sensor Check
Trigger =

Printed: December 6, 2018 (V 10.74)

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Instantel

Event Report

Date/Time	Vert at 16:07:18 December 5, 2017
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254.0 mm/s
Record Time	4.0 sec at 1024 sps
Job Number:	2

Serial Number	BE17806 V 10.60-8.17 MiniMate Plus/8
Battery Level	6.1 Volts
Unit Calibration	September 22, 2016 by CIMFR, Dhanbad
File Name	S806H6NM.460

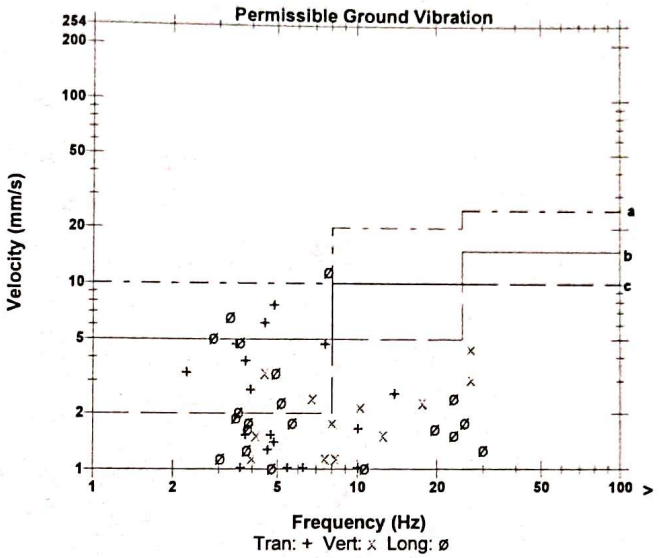
Notes

Microphone	Linear Weighting
PSPL	129.9 dB(L) 62.75 pa.(L) at 0.976 sec
ZC Freq	21 Hz
Channel Test	Disabled

	Tran	Vert	Long	
PPV	7.620	4.445	11.56	mm/s
PPV	68.64	63.96	72.26	dB
ZC Freq	4.8	27	7.8	Hz
Time (Rel. to Trig)	0.387	0.128	0.347	sec
Peak Acceleration	0.066	0.080	0.080	g
Peak Displacement	0.219	0.110	0.252	mm
Sensor Check	Disabled	Disabled	Disabled	
Frequency	***	***	***	Hz
Overswing Ratio	***	***	***	

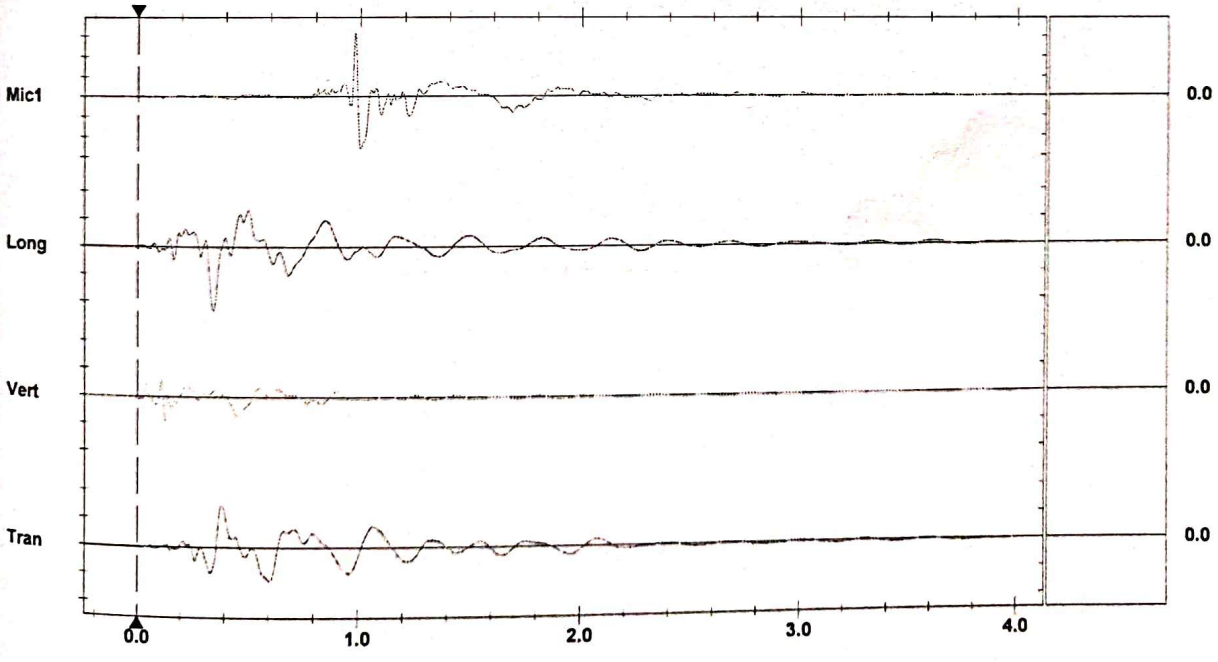
Peak Vector Sum 12.24 mm/s at 0.347 sec

DGMS India (A)



Frequency (Hz)
Tran: + Vert: x Long: ø

a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 5.000 mm/s/div Mic: 20.00 pa.(L)/div
Trigger =

Sensor Check

Printed: December 6, 2018 (V 10.74)

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Instantel

Event Report

Date/Time	Vert at 16:07:51 December 8, 2017
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254.0 mm/s
Record Time	4.0 sec at 1024 sps
Job Number:	1

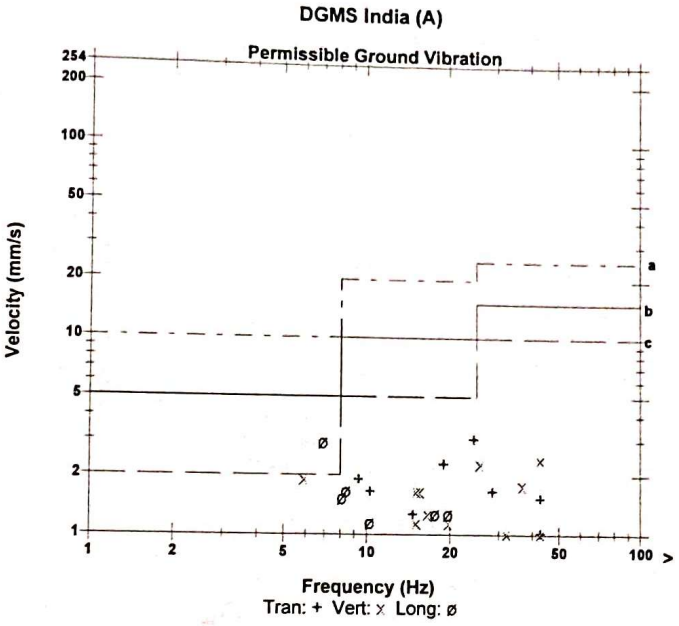
Serial Number	BE17708 V 10.20-1.1 Minimate Blaster
Battery Level	6.1 Volts
Unit Calibration	September 22, 2016 by CIMFR, Dhanbad
File Name	S708H6T6.530

Notes

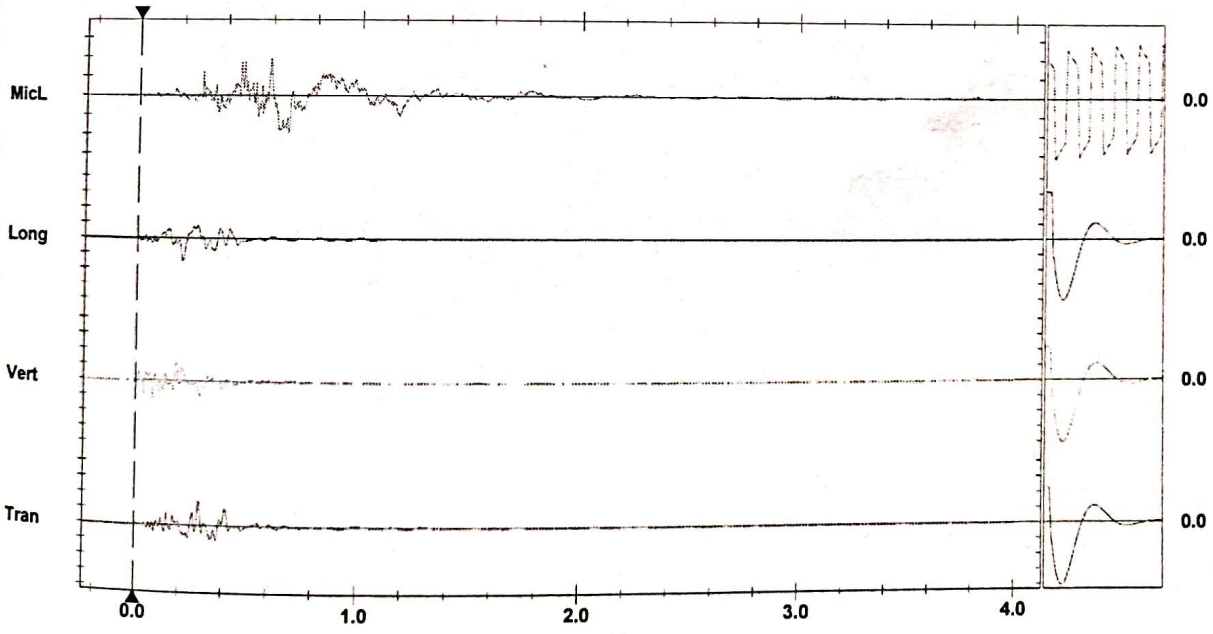
Microphone	Linear Weighting
PSPL	119.7 dB(L) 19.25 pa.(L) at 0.590 sec
ZC Freq	24 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 466 mv)

	Tran	Vert	Long	
PPV	3.048	2.413	2.921	mm/s
PPV	60.68	58.65	60.31	dB
ZC Freq	24	43	6.9	Hz
Time (Rel. to Trig)	0.294	0.078	0.206	sec
Peak Acceleration	0.053	0.066	0.040	g
Peak Displacement	0.032	0.033	0.039	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.5	7.7	Hz
Overswing Ratio	3.9	3.8	3.8	

Peak Vector Sum 3.594 mm/s at 0.296 sec



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger =

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Instantel

Event Report

Date/Time	Vert at 16:10:22 December 8, 2017
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254.0 mm/s
Record Time	4.0 sec at 1024 sps
Job Number:	1

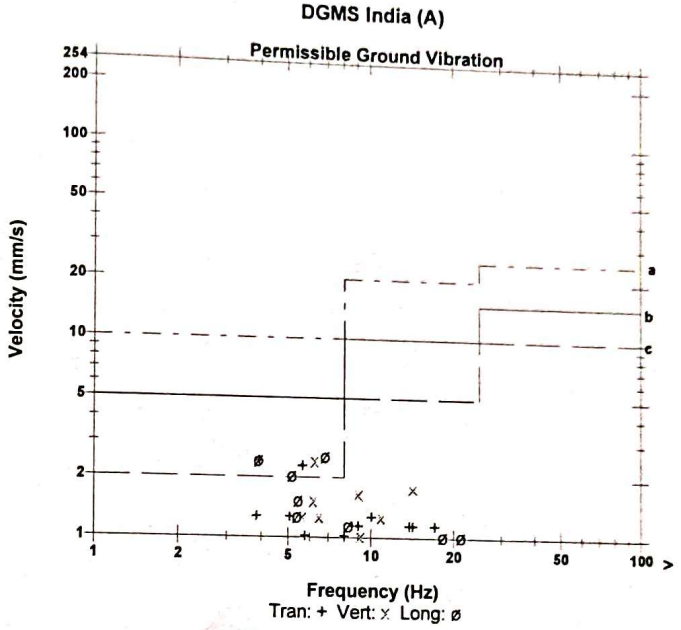
Serial Number	BE17708 V 10.20-1.1 Minimate Blaster
Battery Level	6.1 Volts
Unit Calibration	September 22, 2016 by CIMFR, Dhanbad
File Name	S708H6T6.9A0

Notes

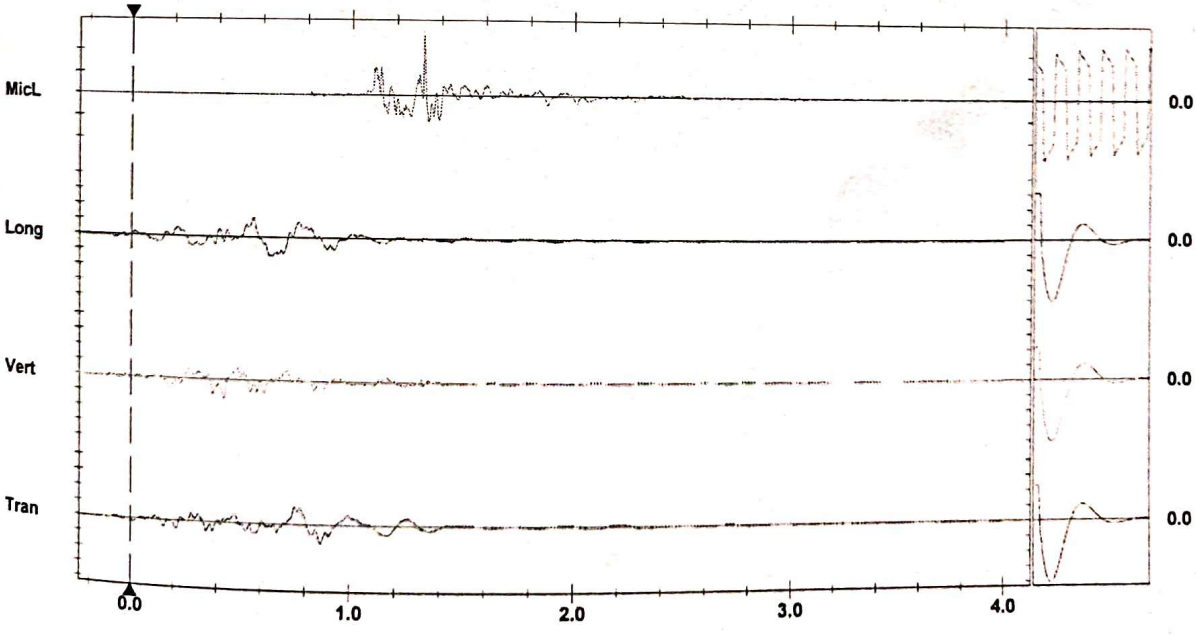
Microphone	Linear Weighting
PSPL	142.6 dB(L) 269.0 pa.(L) at 1.319 sec
ZC Freq	37 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 466 mv)

	Tran	Vert	Long	
PPV	2.413	2.413	2.540	mm/s
PPV	58.65	58.65	59.10	dB
ZC Freq	3.9	6.2	6.8	Hz
Time (Rel. to Trig)	0.869	0.430	0.561	sec
Peak Acceleration	0.027	0.053	0.027	g
Peak Displacement	0.074	0.048	0.101	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.5	7.7	Hz
Overswing Ratio	3.9	3.8	3.8	

Peak Vector Sum 2.940 mm/s at 0.563 sec



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 100.00 pa.(L)/div Sensor Check
Trigger =

Printed: December 6, 2018 (V 10.74)

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Instantel

Event Report

Date/Time	Vert at 15:57:25 December 11, 2017
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254.0 mm/s
Record Time	4.0 sec at 1024 sps
Job Number:	1

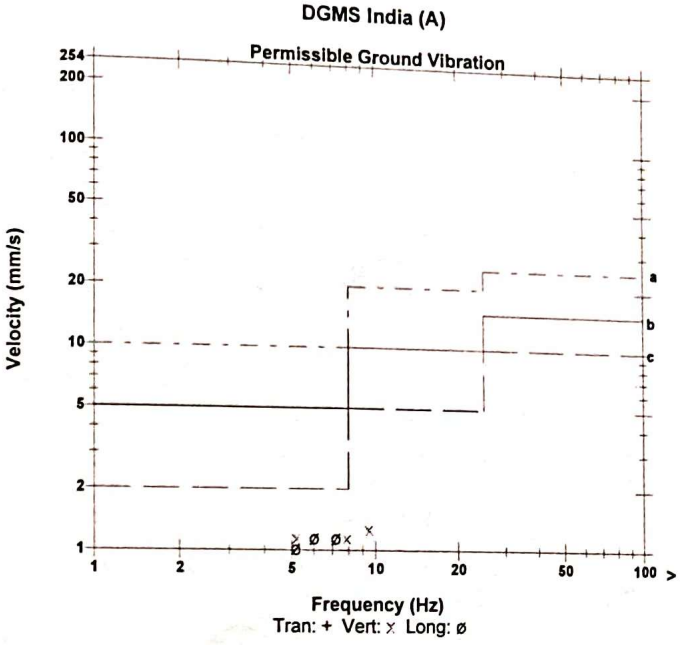
Serial Number	BE17708 V 10.20-1.1 Minimate Blaster
Battery Level	6.2 Volts
Unit Calibration	September 22, 2016 by CIMFR, Dhanbad
File Name	S708H6YP.NP0

Notes

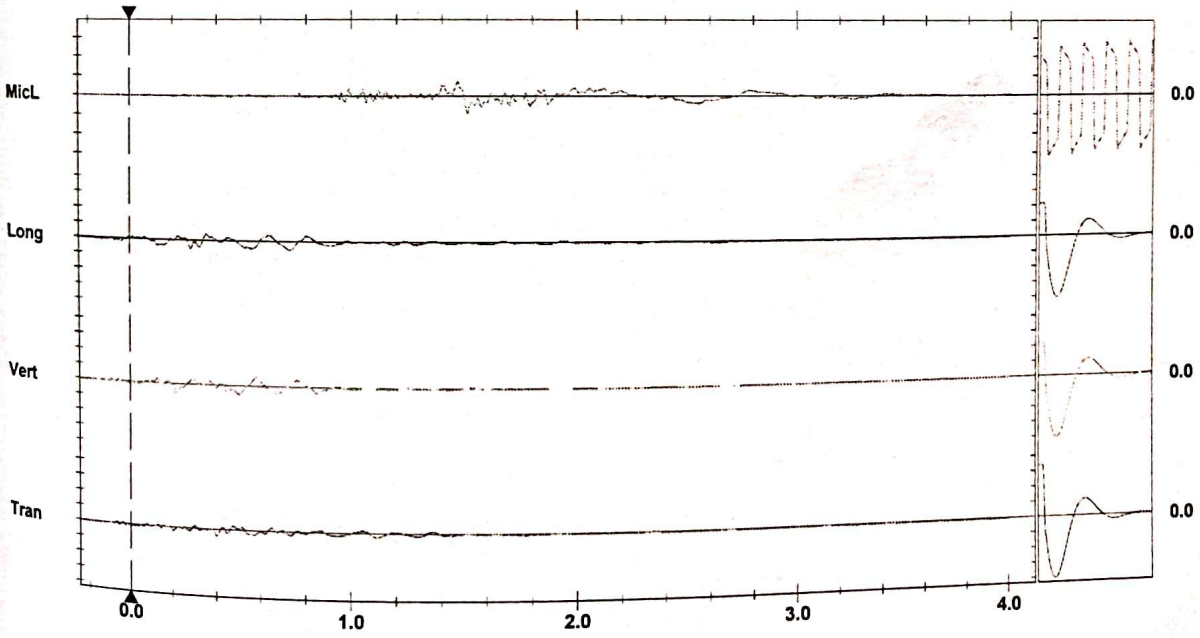
Microphone	Linear Weighting
PSPL	112.3 dB(L) 8.250 pa.(L) at 1.512 sec
ZC Freq	4.5 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 502 mv)

	Tran	Vert	Long	
PPV	0.889	1.270	1.143	mm/s
PPV	49.98	53.08	52.16	dB
ZC Freq	17	9.5	7.2	Hz
Time (Rel. to Trig)	0.399	0.218	0.284	sec
Peak Acceleration	0.013	0.027	0.027	g
Peak Displacement	0.014	0.034	0.033	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.9	7.4	7.3	Hz
Overswing Ratio	3.8	3.8	4.0	

Peak Vector Sum 1.465 mm/s at 0.577 sec



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger =

Printed: December 6, 2018 (V 10.74)

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Instantel

Event Report

Date/Time	Vert at 16:09:32 December 11, 2017
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254.0 mm/s
Record Time	4.0 sec at 1024 sps
Job Number:	1

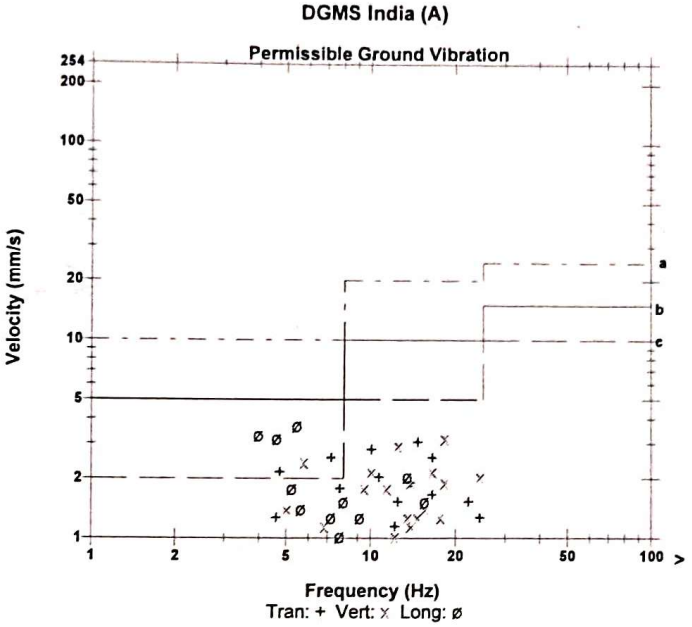
Serial Number	BE17708 V 10.20-1.1 Minimate Blaster
Battery Level	6.2 Volts
Unit Calibration	September 22, 2016 by CIMFR, Dhanbad
File Name	S708H6YQ.7W0

Notes

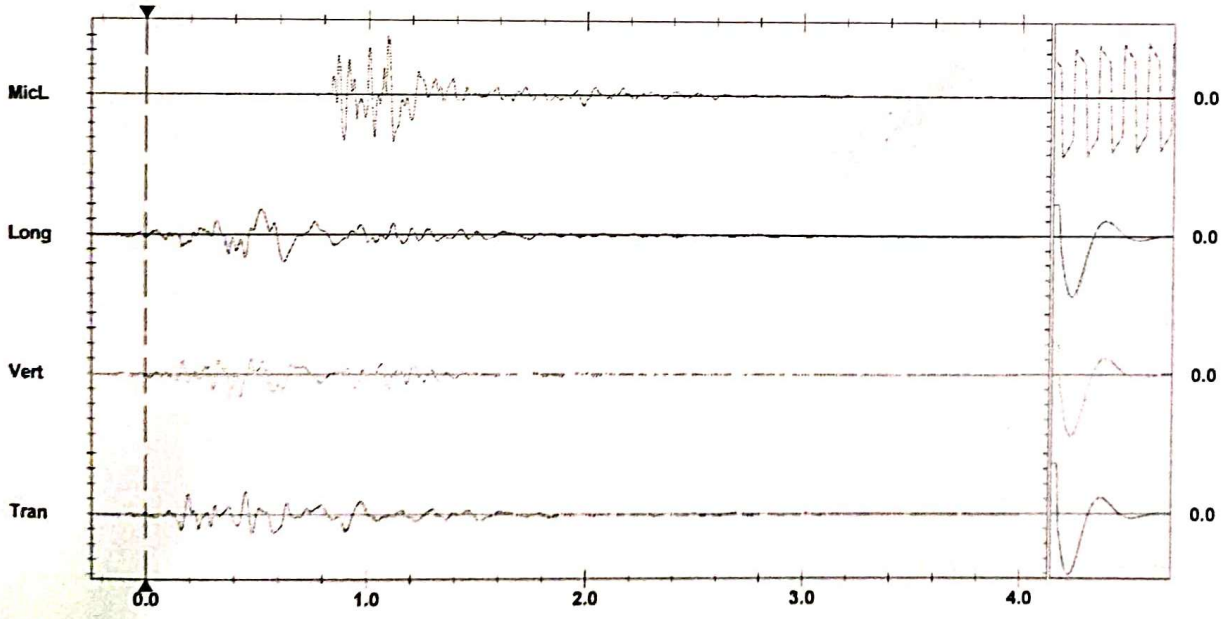
Microphone	Linear Weighting
PSPL	140.2 dB(L) 204.3 pa.(L) at 1.085 sec
ZC Freq	23 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 502 mv)

	Tran	Vert	Long	
PPV	3.048	3.175	3.683	mm/s
PPV	60.68	61.03	62.32	dB
ZC Freq	15	18	5.4	Hz
Time (Rel. to Trig)	0.452	0.386	0.619	sec
Peak Acceleration	0.040	0.040	0.040	g
Peak Displacement	0.057	0.069	0.098	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.9	7.4	7.3	Hz
Overswing Ratio	3.8	3.8	4.0	

Peak Vector Sum 4.344 mm/s at 0.451 sec



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 50.00 pa.(L)/div Sensor Check
Trigger =

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Instantel

Event Report

Date/Time	Vert at 16:59:09 December 27, 2017
Trigger Source	Geo: 0.500 mm/s
Range	Geo: 254.0 mm/s
Record Time	4.872 sec (Auto=4Sec) at 2048 sps
Job Number:	1
Operator/Setup:	Operator/factory.MMB

Serial Number	UM7270 V 10-75 Micromate ISEE
Battery Level	3.8 Volts
Unit Calibration	April 24, 2015 by Instantel
File Name	UM7270_20171227165909.IDFW

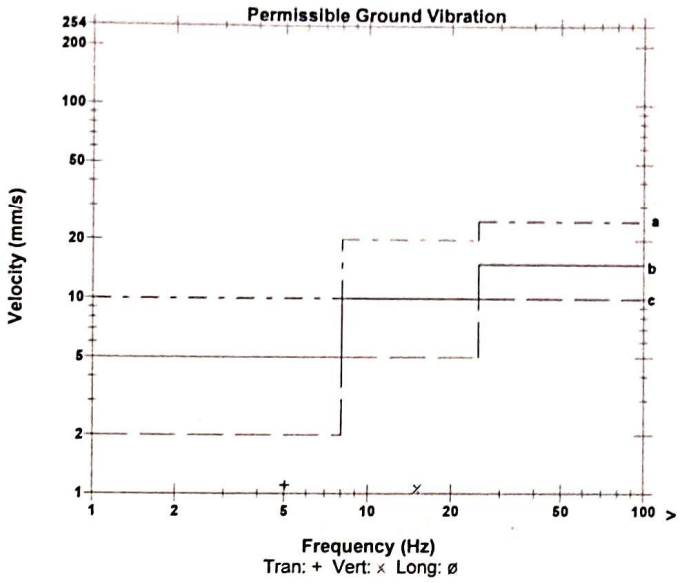
Notes
Location:
Client:
User Name:
General:

Microphone	Linear Weighting
PSPL	121.4 dB(L) 23.55 pa (L) at 3.112 sec
ZC Freq	7.9 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 1231 mv)

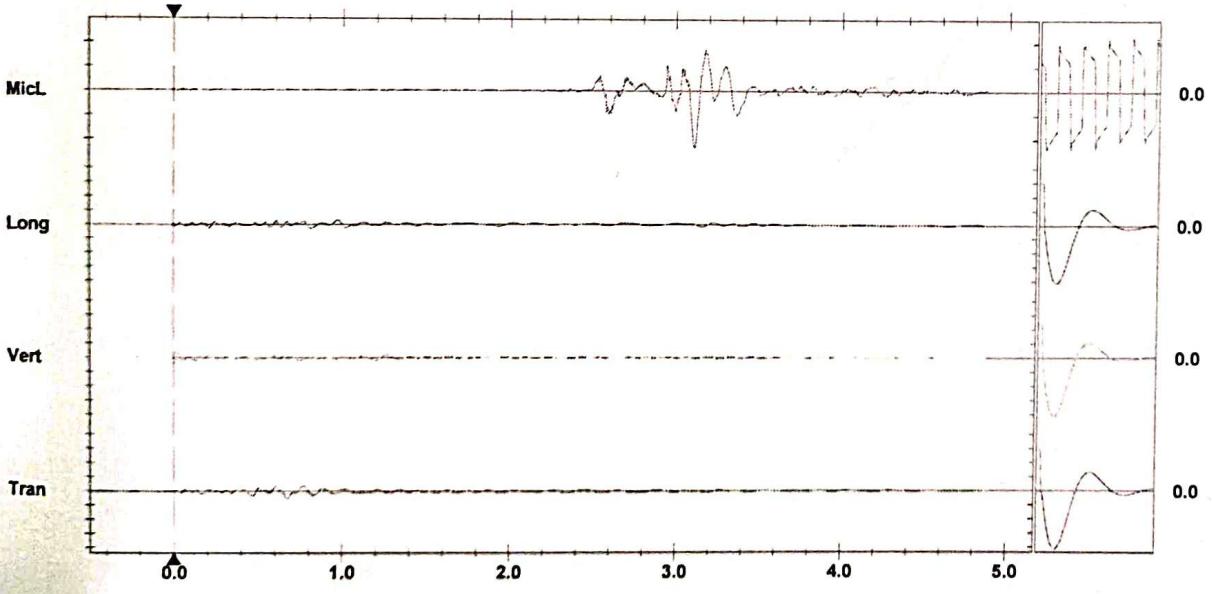
	Tran	Vert	Long	
PPV	1.103	1.072	0.623	mm/s
PPV	51.86	51.60	46.89	dB
ZC Freq	5.0	15.1	8.5	Hz
Time (Rel. to Trig)	0.675	0.020	0.971	sec
Peak Acceleration	0.010	0.025	0.013	g
Peak Displacement	0.022	0.010	0.012	mm
Sensor Check	Passed	Passed	Passed	
Frequency	6.9	7.3	7.1	Hz
Overswing Ratio	3.1	3.9	3.6	

Peak Vector Sum 1.152 mm/s at 0.675 sec

DGMS India (A)



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div
Trigger = ▶—— ——◀

Sensor Check

Printed: December 6, 2018 (V 10.74)

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Instantel

Event Report

Date/Time	Long at 17:00:34 December 27, 2017
Trigger Source	Geo: 0.510 mm/s
Range	Geo: 254.0 mm/s
Record Time	4.0 sec at 1024 sps
Job Number:	1

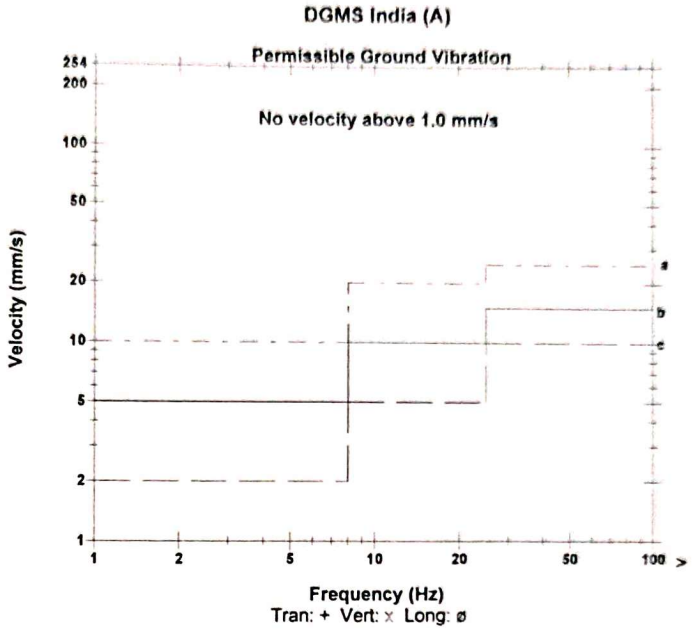
Serial Number	BE17708 V 10.20-1.1 Minimate Blaster
Battery Level	6.1 Volts
Unit Calibration	September 22, 2016 by CIMFR, Dhanbad
File Name	S708H7SF.8Y0

Notes

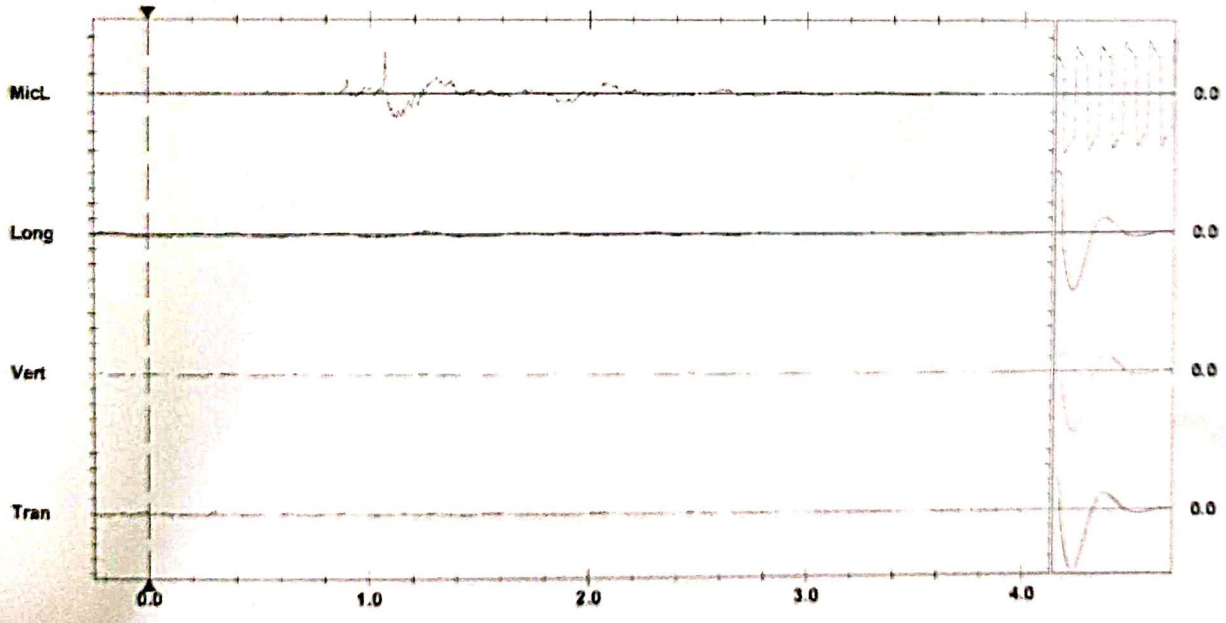
Microphone	Linear Weighting
PSPL	120.9 dB(L) 22.25 pa (L) at 1.066 sec
ZC Freq	16 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 499 mv)

	Tran	Vert	Long	
PPV	0.381	0.381	0.508	mm/s
PPV	42.62	42.62	45.12	dB
ZC Freq	17	27	6.4	Hz
Time (Rel. to Trig)	-0.227	0.205	0.000	sec
Peak Acceleration	0.013	0.013	0.027	g
Peak Displacement	0.006	0.008	0.022	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.4	7.7	Hz
Overswing Ratio	3.9	3.8	3.9	

Peak Vector Sum 0.568 mm/s at 0.101 sec



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa (L)/div

Trigger = ▶——◀

Sensor Check

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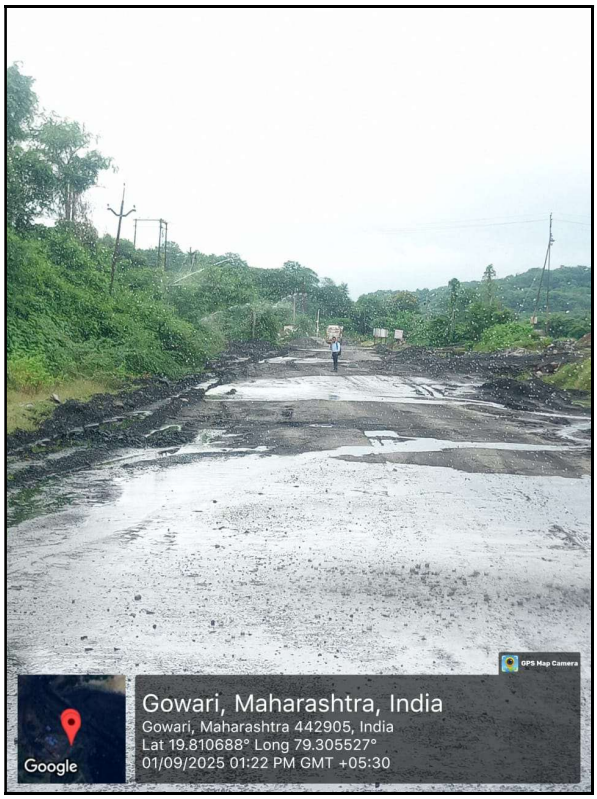
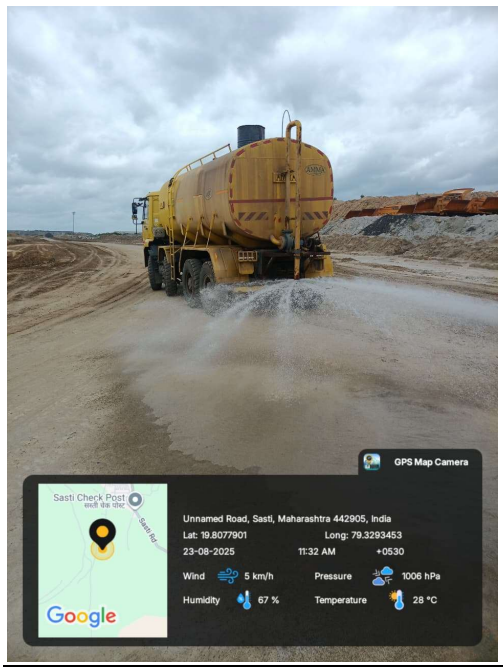
ANNEXURE – 13

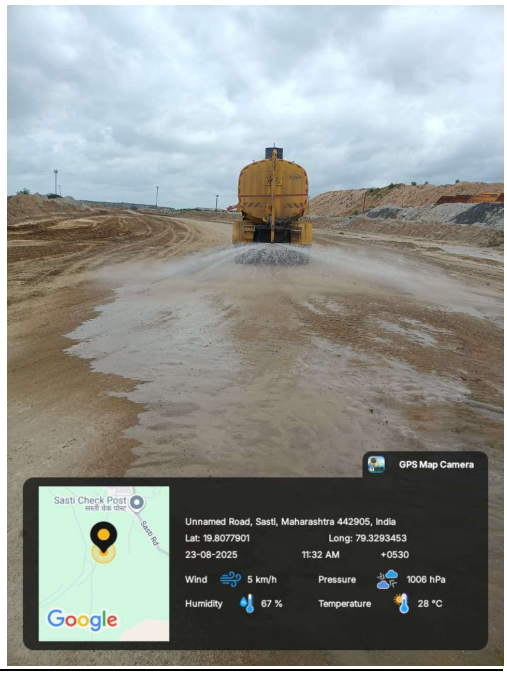
PHOTOS OF SPRINKLER , SOCM



Annexure – 14

Geo Tagged Photos of Mobile Sprinkler, Sasti OC Mine





Annexure – 15

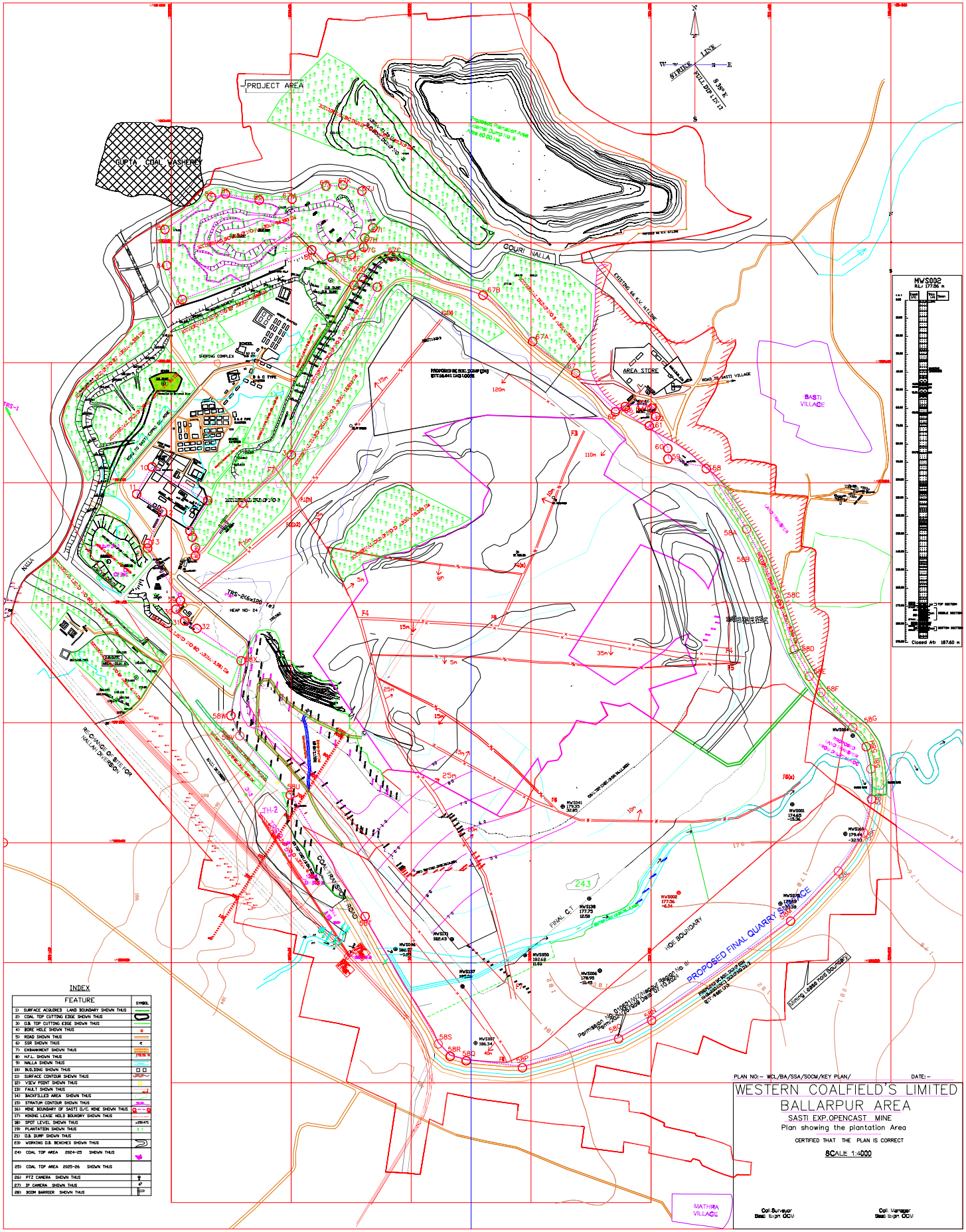
Geo Tagged Photos of Asphalted Road, Sasti OC Mine

Annexure – 16

Photos of Trolley Mounted Fogger, Sasti OC Mine

Annexure – 17

Photos of Tyre Wash System, Sasti OC Mine



INDEX

FEATURE	SYMBOL
1) SURFACE ACQUIRED LAND BOUNDARY SHOWN THUS	
2) COAL TOP CUTTING EDGE SHOWN THUS	
3) O.B. TOP CUTTING EDGE SHOWN THUS	
4) BORE HOLE SHOWN THUS	
5) ROAD SHOWN THUS	
6) SSR SHOWN THUS	
7) EMBANKMENT SHOWN THUS	
8) H.F.L. SHOWN THUS	
9) NALLA SHOWN THUS	
10) BUILDING SHOWN THUS	
11) SURFACE CONTOUR SHOWN THUS	
12) VIEW POINT SHOWN THUS	
13) FAULT SHOWN THUS	
14) BACKFILLED AREA SHOWN THUS	
15) STRATUM CONTOUR SHOWN THUS	
16) MINE BOUNDARY OF SASTI O/C MINE SHOWN THUS	
17) MINING LEASE HOLD BOUNDARY SHOWN THUS	
18) SPOT LEVEL SHOWN THUS	
19) PLANTATION SHOWN THUS	
21) O.B. DUMP SHOWN THUS	
23) WORKING O.B. BENCHES SHOWN THUS	
24) COAL TOP AREA 2024-25 SHOWN THUS	
25) COAL TOP AREA 2025-26 SHOWN THUS	
26) PTZ CAMERA SHOWN THUS	
27) IP CAMERA SHOWN THUS	
28) BOOM BARRIER SHOWN THUS	

Annexure – 17

Photos of Plantation, Sasti OC Mine

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:	Sasti Expn. Oc Mine		
Project Address:	Village - Sasti, Tehsil - Rajura, District - Chandrapur		
Town:	Sasti (ct)	Block:	Rajura
District:	Chandrapur	State:	Maharashtra
Pin Code:			
Communication Address:	Village - Sasti, Tehsil - Rajura, District - Chandrapur, Rajura, Chandrapur, Maharashtra - 442905		
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/REN/1/2024/10301	2.	**Date of Issuence**	11/12/2024
3.	Application No.:	21-4/1878/MH/MIN/2018	4.	Category: (GWRE 2023)	Safe
5.	Project Status:	Existing Ground Water	6.	NOC Type:	Renewal
7.	**Valid from:**	03/08/2023	8.	**Valid up to:**	02/08/2025

9. 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
0.00	0.00			6490.00	2368850.00	6490.00	2368850.00

10. Details of ground water abstraction /Dewatering structures

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

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

11.	Ground Water Abstraction/Restoration Charges paid (Rs.):	20844318.00
12.	Environment Compensation (if applicable) paid (Rs.):	0.00

13. Number of Piezometers(Observation wells) to be constructed/ monitored & Monitoring mechanism.

No. of Piezometers	Monitoring Mechanism		
	Manual	DWLR**	DWLR With Telemetry
2	0	1	1

**DWLR - Digital Water Level Recorder

(Compliance Conditions given overleaf)

This is an auto generated document & need not to be signed.

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

पानी बचाये – जीवन बचाये
SAVE WATER - SAVE LIFE

CENTRAL GROUND WATER AUTHORITY

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 conditions:

Mandatory conditions:

1) Installation of tamper proof digital water flow meter with telemetry on all the abstraction structure(s) shall be mandatory for all users seeking No Objection Certificate and intimation regarding their installation shall be communicated to the CGWA within 30 days of grant of No Objection Certificate.

2) Proponents shall mandatorily get water flow meter calibrated from an authorized agency once in a year.

3) Construction of purpose-built observation wells (piezometers) for ground water level monitoring shall be mandatory as per Section 14 of Guidelines. Water level data shall be made available to CGWA through web portal. Detailed guidelines for construction of piezometers are given in Annexure-II of the guidelines.

4) Proponents shall monitor quality of ground water from the abstraction structure(s) once in a year. Water samples from bore wells/ tube wells / dug wells shall be collected during April/May every year and analysed in NABL accredited laboratories for basic parameters (cations and anions), heavy metals, pesticides/ organic compounds etc. Water quality data shall be made available to CGWA through the web portal.

5) 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.

6) In case of mining project the firm shall submit water quality report of mine discharge/ seepage from Govt. approved/ NABL accredited lab.

7) 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.

8) Industries abstracting ground water in excess of 100 m 3 /d shall undertake annual water audit through certified auditors and submit audit reports within three months of completion of the same to CGWA. All such industries shall be required to reduce their ground water use by at least 20% over the next three years through appropriate means.

9) 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.

10) 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.

General conditions:

11) 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).

12) 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).

13) Proponents shall install roof top rain water harvesting in the premise as per the existing building bye laws in the premise.

14) 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.

15) 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.

16) Wherever feasible, requirement of water for greenbelt (horticulture) shall be met from recycled / treated waste water.

17) 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.

18) 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.

19) In case of violation of any NOC conditions, the applicant shall be liable to pay the penalties as per Section 16 of Guidelines.

20) This NOC does not absolve the proponents of their obligation / requirement to obtain other statutory and administrative clearances from appropriate authorities.

21) 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.

22) In case of change of ownership, new owner of the industry will have to apply for incorporation of necessary changes in the No Objection Certificate with documentary proof within 60 days of taking over possession of the premises.

23) 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.

24) Proponents, who have installed/constructed artificial recharge structures in compliance of the NOC granted to them previously and have availed rebate of upto 50% (fifty percent) in the ground water abstraction charges/ground water restoration charges, shall continue to regularly maintain artificial recharge structures.

25) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, pharmaceutical, other hazardous units etc. (as per CPCB list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution as per Annexure III of the guidelines.

26) In case of new infrastructure projects having ground water abstraction of more than 20 m3/day, the firm/entity shall ensure implementation of dual water supply system in the projects.

27) In case of infrastructure projects, paved/parking area must be covered with interlocking/perforated tiles or other suitable measures to ensure groundwater infiltration/harvesting.

28) In case of coal and other base metal mining projects, the project proponent shall use the advance dewatering technology (by construction of series of dewatering abstraction structures) to avoid contamination of surface water.

29) The NOC issued is conditional subject to the conditions mentioned in the Public notice dated 27.01.2021 failing which penalty/EC/cancellation of NOC shall be imposed as the case may be.
30) This NOC is issued subject to the clearance of Expert Appraisal Committee (EAC) (if applicable).
31) In the self-compliance report, the PP shall submit details of Drilling Agency/ Agencies, which has/ have constructed BW(s)/ TW(s) along with undertaking to the effect that all necessary measures have been taken as per directions of Hon'ble Supreme Court provided in Annexure-VII of guidelines dated 24.09.2020 in respect of abandoned/ failed BW(s)/ TW(s)/Piezometer(s), if any. The PP is advised to engage registered drilling agency/ agencies. In the event of any mishap/ unfortunate incident due to negligence in taking measures for prevention of accident due to falling in Bore Well, both PP and concerned drilling agency shall jointly be held responsible and penal action as per extant Government rules shall be taken.

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

CENTRAL GROUND WATER AUTHORITY

CENTRAL GROUND WATER AUTHORITY

Department of Water Resources, River Development and Ganga Rejuvenation
Ministry of Jal Shakti, Govt. of India

Receipt

(As per the guideline Gazette Notification S.O. 3281(E) regarding the New Guidelines dated 24.09.2020 of CGWA, MoJS, Govt. of India)
https://cgwa-noc.gov.in

Application No,:	21-4/1878/MH/MIN/2018	Date of Issuence:11/12/2024
Name of Firm:	SASTI EXPN. OC MINE	
AppType Category:	*Coal*	
Application Type:	*Mining*	
PAN/GSTIN No. of Firm/Individual:	/	

SN	Description	Amount (Rs.)
1.	Application Processing Fee	**5000.00**
2.	Ground Water Abstraction charges	**20844318.00**
3.	Ground Water Restoration charges	**0**
4.	Environmental Compensation Charges (ECRGW) *(Date From to) Days-*	
5.	Penalty for non-Compliance of NOC conditions *Condition to be mentioned*	**600000.00**
6.	Adjustment Charges	
7.	Rebate	
8.	Charges for correction/modification in the existing issued No Objection Certificate	

S.No.	Description	Rate
(i)	Change in User ID	Rs. 1000
(ii)	Change in firm Name	Rs. 5000
(iii)	Extension of No Objection Certificate	Rs. 5000
(iv)	Issuance of duplicate No Objection Certificate	Rs. 5000
(v)	Issuance of corrigendum to No Objection Certificate	Rs. 5000
(vi)	Any other items/correction etc.	Rs. 500

Rs. Rupees Two Crore Fourteen Lakh Forty Nine Thousand Three Hundred Eighteen Only	**21449318.00**

This is an system generated invoice, hence, does not require ink signed.

Term and conditions:

i. All disputes are subject to Delhi Jurisdiction.
ii. Any complaint in regard to the rates will not be entertained.

Member-Secretary
CGWA, New Delhi

CENTRAL GROUND WATER AUTHORITY

Application for Issue of NOC to Abstract Ground Water

Government of India
Ministry of Jal Shakti
Department of Water Resources, River Development and Ganga Rejuvenation
Central Ground Water Authority (CGWA)

Application Number : MIN/MH/2025/8178/R-2 Submission Date: 02/08/2025

APPLICATION BASIC DETAILS		
PREVIOUS NOC NUMBER: **CGWA/NOC/MIN/REN/1/2024/10301**	PREVIOUS NOC VALID FROM: **03/08/2023**	PREVIOUS NOC VALID TO: **02/08/2025**
APPLICATION TYPE: **Mining**	APPLICATION SUB TYPE: **Open Cast Mine**	PROJECT TYPE: **Coal**
WATER QUALITY TYPE: **Fresh Water**	WHETHER INDUSTRY IS MSME: **No**	Renewal Applied For: **INCREASE IN QUANTUM**
CommercialUse: × Drinking Domestic Use: × Dewatering: ✓		

	PREVIOUS NOC QUANTUM (A)	CHANGE IN QUANTUM (B)	FINAL QUANTUM APPLIED [C = A-B]
KLD	6490.00	4061.00	0
KLY	2368850.00	1482265.00	0

PROJECT DETAILS		
PROJECT NAME: **SASTI EXPN. OC MINE**	STATE: **MAHARASHTRA**	DISTRICT: **CHANDRAPUR**
ASSESSMENT UNIT(BLOCK/TEHSIL): **RAJURA (Status: Safe)**	ADDRESS: **VILLAGE - SASTI, TEHSIL - RAJURA, DISTRICT - CHANDRAPUR**	PINCODE: **442905**
LATITUDE: **19.820000**	LONGITUDE: **79.310000**	Geology: **NON-ALLUVIUM (HARD ROCK)**
WATER REQUIRED FOR GREEN BELT: **No**	GREEN BELT AREA(SQ METER): **4516500.00**	PROJECTS FALL WITH IN 500M IN THE PERIPHERY OF WETLAND AREAS: **No**

COMPANY DETAILS		
COMPANY NAME: **WESTERN COALFIELDS LIMITED**	COMPANY PHONE NUMBER: **8275970222**	COMPANY GST NO.: **27AAACW1578L1ZW**
COMPANY PAN CARD NO.: **AAACW1578L**	COMPANY EMAIL: **gmenvironment.wcl@coalindia.in**	COMPANY POSTAL ADDRESS: **Western Coalfields Limited Coal estate, Civil Lines, Nagpur, Maharashtra - 440001**
COMPANY STATE: **MAHARASHTRA**	COMPANY DISTRICT: **NAGPUR**	COMPANY PIN CODE: **440001**

BREAKUP OF WATER REQUIREMENT, AVAILABILITY AND USAGE

#	ACTIVITY	NO. OF OPERATIONAL Days in a Year	EXSITING QUANTUM (m^3 /DAY)	EXSITING QUANTUM (m^3 /YEAR)	PROPOSED QUANTUM (m^3 /DAY)	PROPOSED QUANTUM (m^3 /YEAR)	TOTAL QUANTUM (m^3 /DAY)	ANNUAL QUANTUM (m^3 /YEAR)
	Total Water Requirement (A1)							
1	Drinking And Domestic Use	0	0.00	0.00	0.00	0.00	0.00	0.00
	Gainful Utilization of Mine Dewater (A2)							
2	Water Supply to Villages	0	0.00	0.00	0.00	0.00	0.00	0.00
3	Irrigation use	0	0.00	0.00	0.00	0.00	0.00	0.00
4	Green Belt Development	0	0.00	0.00	0.00	0.00	0.00	0.00
5	Suppression of Dust	365	2500.00	912500.00	0.00	0.00	2500.00	912500.00
6	Recharge/ Water Conservation	0	0.00	0.00	0.00	0.00	0.00	0.00
7	Others	365	28.00	10220.00	0.00	0.00	28.00	10220.00
8	Remaining Water Left	365	3962.00	1446130.00	4061.00	1482265.00	8023.00	2928395.00
	TOTAL (USAGE)		**6490.00**	**2368850.00**	**4061.00**	**1482265.00**	**10551.00**	**3851115.00**
	Water Availability from other Sources other than Ground Water (B)							
1	Surface Water Availability	0	0.00	0.00	0.00	0.00	0.00	0.00
2	Water Supply from Other Agencies	0	0.00	0.00	0.00	0.00	0.00	0.00
3	Recycled Water Generated / Used	0	0.00	0.00	0.00	0.00	0.00	0.00
	TOTAL (AVAILABILITY)		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	Net Ground Water Requirement (C)							
1	Ground Water Required through Abstraction Structure	0	0.00	0.00	0.00	0.00	0.00	0.00
2	Rainfall Component of Dewatering	0	4339.00	1583735.00	3599.00	1313635.00	7938.00	2897370.00
3	Ground Water Seepage Component of Dewatering	0	2151.00	785115.00	462.00	168630.00	2613.00	953745.00
	TOTAL (GROUND WATER REQUIREMENT)		**6490.00**	**2368850.00**	**4061.00**	**1482265.00**	**10551.00**	**3851115.00**

GROUNDWATER STRUCTURE EXISTING

S.No.	TYPE OF STRUCTURE	YEAR OF CONSTRUCTION	DEPTH (METER)	WHETHER FITTED WITH WATER METER
1	Pump/Mine Pump	2007	120.00	YES
2	Pump/Mine Pump	2023	120.00	YES
3	Pump/Mine Pump	2023	120.00	YES

GROUNDWATER STRUCTURE PROPOSED

S.No.	TYPE OF STRUCTURE	No. OF STRUCTURE COUNT
1	Borewell	1
2	Pump/Mine Pump	2

DEWATERING DETAILS

WHETHER THE GROUNDWATER TABLE WILL BE INTERSECTING MINE DEPTH:	YES	DEPTH TO WATER LEVEL(M BGL):	4.00
DEPTH UPTO WHICH MINING IS PROPOSED (M BGL):	175.00	PROVIDE DETAILS OF GAINFUL UTILIZATION MENTIONED IN OTHERS (ITEM NO 7 OF A2 IN BREAKUP OF WATER REQUIREMENT):	Dust Suppression and others

NO OF MINE PITS EXISTING:	1	NO OF MINE PITS PROPOSED:	0	TOTAL AREA OF PITS (SQ METER):	900000.00

ATTACHMENTS

NAME	Remark	File
Approved Mine Plan as per approving authority		
Comprehensive Hydrogeological report and Modelling by Accredited Consultant		
Notarised affidavit as proof for justifying the increase of quantum of GW abstraction		
Latest Mine Plan with approved increase in quantum		
Copy of Rain Water Harvesting Plan		
Additional Documents	Query has been replied vide letter no. 1692 dated 12.08.2025. Submitted for kind consideration.	

PAYMENTS

Receipt No	Payment Amount	Receipt Date	
	0.00		View Receipt
10506	4778677.00	02-08-2025	View Receipt

The Details of ESCROW Account of Sasti OC Mine of Ballarpur Area, WCL.

- ESCROW Account Number (**Original**) : 08973161002874
- Name of ESCROW Agent : Punjab National Bank,
  Jari Patka,Nagpur – 440016
- Account Balance As on 31/03/2025 : **Rs. 102,92,47,269.64/-**

F. No. CPAM-34011/28/2019-CPAM [E-343762]
Government of India
Ministry of Coal
(MPS Section)
*****

Room No. 622-A, Shastri Bhawan,
New Delhi, Dated: 31st January, 2025

Office Memorandum

Subject: Guidelines for Preparation of Mining Plan and Mine Closure Plan for Coal and Lignite blocks 2025—reg.

The undersigned is directed to forward herewith the *Guidelines for the Preparation of Mining Plan and Mine Closure Plan for Coal and Lignite Blocks, 2025, for further necessary action and necessary compliance.*

2. All the provisions of this Mining Plan Guidelines shall become effective with immediate effect, except provisions contained in Para 2.7(c) and Para 2.9, which shall be effective upon issuance of necessary notification under the Mineral Concession Rules, 1960. Until the notification of the amendment in the Mineral Concession Rules, 1960, is issued, provisions contained in Para 1.3(A), 1.3(B), and 1.9 of the Guidelines for Preparation, Formulation, Submission, Processing, Scrutiny, Approval, and Revision of Mining Plan for Coal and Lignite Blocks dated 29.05.2020 shall continue to remain in force.

Encl: As above

Signed by
Hitlar Singh
Date: 31-01-2025 12:13:00
(Hitlar Singh)
Under Secretary to the Govt. of India
Email: hitlar.singh85@nic.in

To

1. Chairman, Coal India Ltd.
2. CMD, SCCL
3. CMD, NLCIL
4. Coal Controller, Coal Controller Organization, New Delhi
5. O/o Nominated Authority- to circulate it to all Coal Companies except stated above

Copy to:

1. Secretary, Ministry of Environment, Forest & Climate Change
2. Secretary (Mines)- All coal/Lignite bearing states
3. DG, DGMS
4. All Joint Secretaries, Ministry of Coal
5. Sr. Technical Director, NIC – with request to place on website of MoC

Mining Plan Guidelines

for

Coal and Lignite Mine

2025

court etc. and duly certified by the Coal Controller. This should also indicate the estimated extractable coal resources and coal actually mined out.

(iv) A corpus from 10 percent of the balance deposited amount from final mine closure cost is to be created towards Just Transformation. This amount may be utilized by project proponent for socio-transition after the closure of the mine in consultation with district administration, local authority and stakeholders for skill development, sustained livelihood and employment generation etc. The detailed modalities for usage of fund will be issued separately. The proponent to prepare a plan for just transformation after the mine closure for utilizing 10% of just transformation fund and engage agency to implement the plan before the reimbursement of 90 % of the balance amount.

(v) In the case of fly ash dumping in abandoned mines where mine voids are separable as per Para 4.1 and a separate Mining Plan/Mine closure plans are prepared, only the apportioned amount for the required area for fly ash dumping such as the cost for Top Soil Management and Biological Reclamation, Safety and Environmental Monitoring till the final mine closure and post closure is to be retained. The remaining amount may be released for rest of the area after the completion of post-mining closure activities.

3.6. Final Mine Closure Plan: The details of the Mining Plan, covering the Final Mine Closure Plan envisaging the details of the updated cost estimates for various mine closure activities and the Escrow Account already set up, shall be submitted to the approving authority for approval at least five years before the intended final mine closure. Final Mine Closure Plan shall also contain a completion report containing operational history, Past investigation/study/Scientific findings and further action taken, if any; mine working maps and drawings; mine water discharge and their uses, GPS coordinates for all salient features, safely accessible open portions of mine workings, dumps, area depillared, partially extracted and standing on pillars, any monitoring and maintenance satellite data and final landscape data etc. (a) Final Mine Closure would be considered to be completed only after acceptance of the third-party audit report by the Coal Controller on the compliance of all provisions of the Mine Closure Plan. Any Institute/ Organization/Agency as may be specified by the Government for this purpose may be engaged for Third Party audit to create a self-sustained ecosystem. Failure of restoration within the specified period may result in forfeiture of the Escrow Account created as per Para 3.5.1, and 3.5.2. The details of the Final Mine Closure Plan along with the details of the updated cost estimate for various mine closure activities and escrow account already set up shall be submitted at the time of approval of final mine closure plan.

3.7. Time Scheduling for mine closure: Post mining closure period is to be taken as 3 (three) years and post closure monitoring period will be for 2 (two) years after that. However, in no case the combined period shall exceed 7 (seven) years. The Action plan for carrying out all mine closure operations (progressive and final mine closure) should be furnished in the form of a bar chart for the period of life of the mine plus post-closure period as specified in **Appendix-X,** but not limited to these activities. The project proponent is mandated to establish targets for closure activities according to the bar chart in accordance with activities approved in mine closure plan. Reimbursement of the ESCROW Amount during each

Land Restoration / Reclamation Monitoring of 26 opencast projects of Western Coalfield Limited producing More than 5 million Cu. M. (Coal+OB) per annum based on Satellite Data of the Year 2024

वेस्टर्न कोल्फील्ड्स लिमिटेड के ५ मिलियन घनमीटर (कोल+अधिभार) से अधिक उत्पादन क्षमतावाले २६ खुली खदानों के भूमि पुनरूद्धार हेतु २०२४ के उपग्रह डाटा के आधार पर निगरानी का वार्षिक प्रतिवेदन

Submitted to

Western Coalfields Limited

Land Restoration / Reclamation Monitoring of 26 opencast projects of Western Coalfield Limited producing More than 5 million Cu. M. (Coal+OB) per annum based on Satellite Data of the Year 2024

वेस्टर्न कोल्फील्ड्स लिमिटेड के ५ मिलियन घनमीटर (कोल+अधिभार) से अधिक उत्पादन क्षमतावाले २६ खुली खदानों के भूमि पुनरूद्धार हेतु २०२४ के उपग्रह डाटा के आधार पर निगरानी का वार्षिक प्रतिवेदन

March 2025

Remote Sensing Cell
Geomatics Division
CMPDI-HQ, Ranchi

Document Control Sheet

(1) Job No.	564924124
(2) Publication Date	March 2025
(3) Number of Pages	84
(4) Number of Figures	29
(5) Number of Tables	02
(6) Number of Plates	26
(7) Title of Report	Land Restoration / Reclamation Monitoring of Open Cast of Western Coalfields Ltd producing More than 5 million Cu.m. (Coal+OB) Based on Satellite Data for the Year 2024
(8) Aim of the Report	To prepare land use/cover map of leasehold area of 26 opencast projects based on high resolution satellite data (IRSR2-L4FX) of the year 2024 using digital image processing technique.
(9) Executing Unit	Remote Sensing Cell, Geomatics Division, Central Mine Planning & Design Institute Limited, Gondwana Place, Kanke Road, Ranchi 834008
(10) User Agency	Western Coalfields Ltd., Nagpur, Maharashtra.
(11) Author	1) Swabhiman Dehariya, Asst. Manager (Mining/Geomatics) 2) Taluk Mondal, Chief Manager (E&M /Geomatics)
(12) Security Restriction	Restricted Circulation
(13) No. of Copies	5
(14) Distribution Statement	Official

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कार्यकारी सारांश

1.0 परियोजना

वेस्टर्न कोल्फील्ड्स लिमिटेड के ५ मिलियन घन मीटर (कोल+ अधिभार) से अधिक उत्पादन क्षमतावाली २६ खुली खदानों के पुनरुद्धार हेतु वर्ष २०२४ के उपग्रह डाटा पर आधारित पर सलाना नियमित निगरानी।

उपरोक्त २६ खुली में से १३ परियोजनाए जिन्हें भताड़ी, बेलोरा-नयागांव, बल्लारपुर, जुनाड ,कोलारपिम्प्री, हिंदुस्तान लाल्पेथ, गौरी-पौनी, गोंडेगाँव, अदासा (भूमिगत से खुली खदान) ,भानेगओं, गोकुल, इन्दर-कामठी एकीकृत और धुपतला खुली खदानों के नाम से जाना जाता है, इन्हें कार्य - आदेश के तहत ५ मिलियन घन मीटर (कोल+अधिभार) से अधिक क्षमता वाले खदानों के श्रेणी में पहली बार शामिल किया गया है|

2.0 उद्देश्य

भूमि पुनरुद्धार (लैंड रिक्लेमेशन) का उद्देश्य कुल पट्टाक्षेत्र में बैकफील, वृक्षारोपण, सामाजिक वानिकी, सक्रिय खनन क्षेत्र, जल निकाय (वाटर ड्रेनेज) बंजर भूमि, कृषि भूमि और जंगल के विभिन्न प्रकार के वितरण प्रणाली के क्षेत्र का आकलन करना है। यह अध्ययन न केवल उपरोक्त सभी खुली खदानों के भूमि पुनरुद्धार (लैंड रिक्लेमेशन) की प्रगति का आकलन में मदद करेगा बल्कि पर्यावरण संरक्षण के लिए आवश्यक उपचारात्मक उपायों को क्रियान्वित करने में भी सहायता करेगा।

3.0 मुख्य निष्कर्ष

- वर्ष २०२४-२०२५ के लिए भुमि पुनरूद्धार(लेंड रिक्लेमेंशन) की निगरानी हेतु डब्लू.सी.एल के २६ खुली परियोजनाए जिनका नाम सास्ती, दुर्गापुर, मुंगोली, उमरेड, उकनी, नीलजयी, न्यू माजरी, मकरधोकरा ३, पेनगंगा , एकोना १ और २ (एकीकृत), न्यू मजरी भूमिगत से खुली खदान, पौनी-२ (विस्तार), मकरधोकरा १ (विस्तार), भटाडी, गोकुल, इन्दर-कामठी एकीकृत तथा धुपतला है| इनका कुल पट्टा क्षेत्र २४२.७३ वर्ग किलोमीटर हैं, जिसमे से ६५.९९ वर्ग किलोमीटर उत्खनित क्षेत्र है जिसमें क्रमशः १९.२४ वर्ग किलोमीटर (२९.१६%) बैकफील क्षेत्र (तकनीकी पुनुरुद्धार), ६.०८ वर्ग किलोमीटर (९.२१%) वृक्षारोपण (जैविक पुनरुद्धार) का क्षेत्र तथा ४०.६७ वर्ग किलोमीटर (६१..६३%) सक्रिय खनन क्षेत्र के अंतर्गत पाया गया| इस विश्लेषण से स्पष्ट है कि कुल खुली खदानों के उत्खनित क्षेत्र में से ३८.३७ प्रतिशत का क्षेत्र जैविक और तकनिकी रूप से भूमि पुनरूद्धार का कार्य हो गया है और शेष ६१.६३ प्रतिशत का क्षेत्र सक्रिय खनन के अंतर्गत है| परियोजनावार विवरण तालिका -१ और चित्र-१ दर्शाया गया है (तुलनात्मक अध्ययन के उद्देष्य के लिए तालिका -१ देखें)

- विभिन्न परियोजनाओं के लिए वर्ष २०२३ के सापेक्ष में वर्ष २०२४ में किये गए भुमि पुनरूद्धार की स्थिति की तूलना करने के पश्चात विश्लेषण से यह स्पष्ट है कि भूमि पुनरुद्धार के अंतर्गत वर्ष २०२३ के कुल क्षेत्र २३.२४ वर्ग किलोमीटर से बढ़कर वर्ष २०२४ में २५.३२ वर्ग किलोमीटर हो गया है, २६ खुली परियोजनाओं में से बल्लारपुर खुली खदान में भुमि पुनरूद्धार का कार्य

अधिकतम ८५.९५ प्रतिशत हुआ है अतः इसे शीर्ष स्थान पर रखा गया है इसके बाद क्रमशः सास्ती खुली खदान (८०.७३ प्रतिशत) तथा उमरेड (६६.२५ प्रतिशत) खुली परियोजनाओं का स्थान है|

- वर्ष २०२३ के कुल जैविक भूमि पुनरूद्धार (बैकफ़िल पर वृक्षारोपण) के अंतर्गत का क्षेत्र ५.२६ वर्ग किलोमीटर के तूलना में वर्ष २०२४ में बढ़कर ६.०८ वर्ग किलोमीटर हो गया है जबकि वर्ष २०२३ के तकनीकी पुनरूद्धार (बैकफील के अंतर्गत क्षेत्र) का क्षेत्र १७.९५ वर्ग किलोमीटर से बढ़कर वर्ष २०२४ में १९.२४ वर्ग किलोमीटर हो गया है | भूमि पुनरूद्धार के अंतर्गत २.०८ वर्ग किलोमीटर की यह वृद्धि पर्यावरण सरंक्षण के दिशा में वेस्टर्न कोलफील्ड्स लिमिटेड के द्वारा उठाये गए सकारात्मक प्रयासों का परिणाम है|

Executive Summary

1.0 Project Land restoration / reclamation monitoring of 26 opencast coal mines of Western Coalfields Ltd. (WCL) producing 5 million cu.m. and more (Coal+OB) per year based on satellite data, regularly on annual basis. Among 26 opencast coal mines projects, 13 projects namely Bhatadi, Bellora-Naigaon, Ballarpur, Junad, Kolarpimpiri, Hindustan Lalpeth (HLOCM), Gauri- Pauni, Gondegaon, Adasa UG to OC, Bhanegaon, Gokul, Inder Kamptee Amal. and Dhuptala have been included in 2024 for the first time as per the work order, their capacity (Coal+OB) have been increased to category of more than 5 million cubic meter from category of less than 5 million cu.m. per year.

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

3.0 Salient Findings

- Out of total leasehold area of 242.73 Km2 of 26 projects of WCL viz. Sasti, Durgapur, Mungoli, Umrer, Ukni, Niljai, New Majri. Makardhokra-III, Penganga, Yekona-I & II (Amal), New Majri UG to OC, Pauni-II (Expn.), MKD-I (Expn.), Bhatadi, Bellora-Naigaon, Ballarpur, Junad, Kolarpimpiri, Hindustan Lalpeth (HLOCM), Gauri-Pauni, Gondegaon, Adasa UG to OC, Bhanegaon, Gokul, Inder-Kamptee Amal., and Dhuptala considered for monitoring during 2024-25; the total excavated area is 65.99 Km2 out of which 19.24 Km2 area (29.16%) is backfilled (Technical Reclamation), 6.08 Km2 area (9.21%) has been planted (Biological Reclamation) and 40.67 Km2 area (61.63%) is under active mining. It is evident from the analysis that 38.37% area of the OC projects has been reclaimed (biological and technical) and balance 61.63% area is under active mining. Project wise details are given in Table-1 & Fig-1. (For comparison purpose, refer Table-1).

- On comparing the status of land reclamation for the year 2024 with respect to the year 2023 in different projects, it is evident from the analysis that total area under land reclamation has increased from 23.24 Km2 (Yr. 2023) to 25.32 Km2 (Yr.2024). Out of 26 projects of WCL, Ballarpur OC ranks on top for land reclamation (85.95%) followed by Sasti OC (80.73%) and Umrer OC (66.25%).

- Area under biological reclamation (Plantation on backfill) has increased from 5.26 Km2 (Yr. 2023) to 6.08 Km2 (Yr. 2024) whereas area of technical reclamation (area under backfilling) has increased from 17.98 Km2 (Yr. 2023) to 19.24 Km2 (Yr. 2024) in WCL. The total increase of 2.08 Km2 under reclamation is the result of the efforts of the Western Coalfields Ltd. taken up towards environmental protection

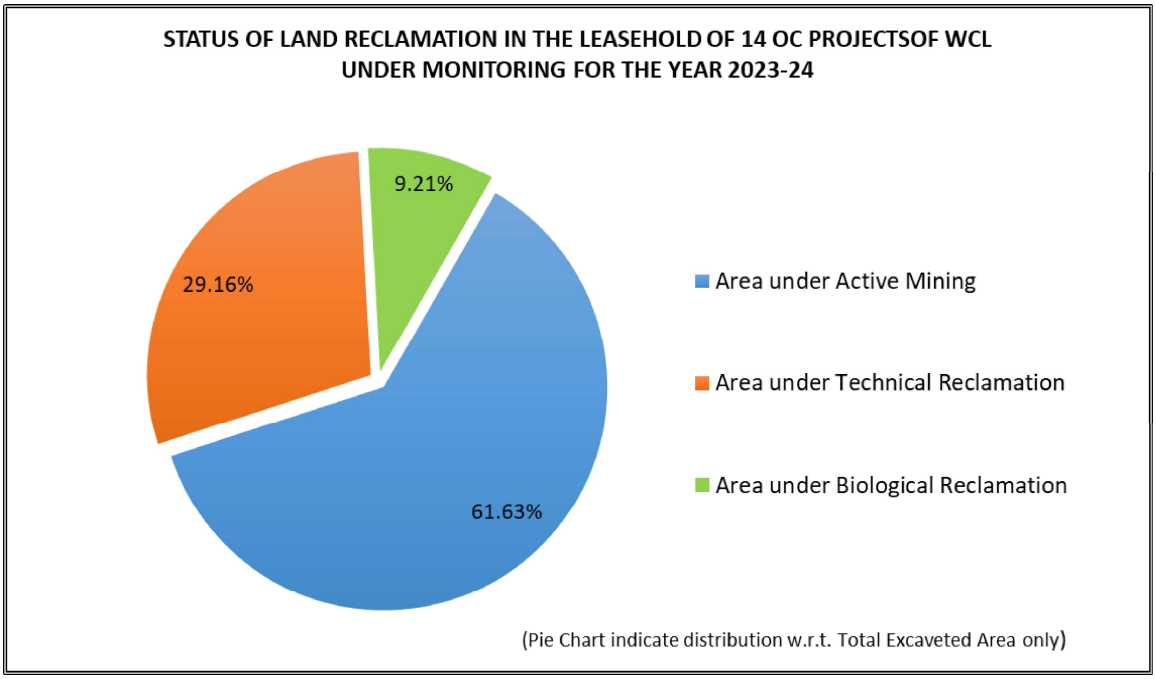


Fig.1: Pie Chart indicating distribution (%) of reclamation activities in 26 OC Mines of WCL

Table-1

Projectwise Land Reclamation Status in Opencast Projects of WCL

(>5 Million Cubic Metre Coal+OB) based on Satellite Data of the year 2024

(Area in Sq. Kms.)

Sl. No.	Project	Total Leasehold Area		Technical Reclamation		Plantation						Area under Active Mining		Total Excavated Area		Total Area under Plantation (% Green Cover Generated in Leasehold)		Total Area under Reclamation	
						Biological Reclamation		Other Plantations											
				Area under Backfilling		Plantation on Excavated / Backfilled Area		Plantation on External Over Burden Dumps		Social Forestry, Avanue Plantation Etc.									
1	*2*	*3*		*4*		*5*		*6*		*7*		*8*		*9 (=4+5+8)*		*10 (=5+6+7)*		*11(=4+5)*	
	A	*2023*	*2024*	*2023*	*2024*	*2023*	*2024*	*2023*	*2024*	*2023*	*2024*	*2023*	*2024*	*2023*	*2024*	*2023*	*2024*	*2023*	*2024*
1	Sasti	9.20	11.12	2.72	2.90	0.73	0.62	1.68	1.92	0.68	0.71	0.50	0.84	3.95	4.36	3.09	3.25	3.45	3.52
				68.86%	66.51%	18.48%	14.22%					12.66%	19.27%			33.59%	29.23%	87.34%	80.73%
2	Durgapur	15.50	15.50	1.04	0.96	1.06	1.18	2.81	2.99	1.19	1.26	2.57	2.75	4.67	4.89	5.06	5.43	2.10	2.14
				22.27%	19.63%	22.70%	24.13%					55.03%	56.24%			32.65%	35.03%	44.97%	43.76%
3	Mugoli	12.55	12.55	1.53	1.70	0.17	0.2	1.9	1.98	0.61	0.65	1.95	2.23	3.65	4.13	2.68	2.83	1.70	1.90
				41.92%	41.16%	4.66%	4.84%					53.42%	54.00%			21.35%	22.55%	46.58%	46.00%
4	Umrer	9.45	9.45	1.51	1.47	1.63	1.73	1.45	1.45	2.32	2.32	1.69	1.63	4.83	4.83	5.40	5.50	3.14	3.20
				31.26%	30.43%	33.75%	35.82%					34.99%	33.75%			57.14%	58.20%	65.01%	66.25%
5	Ukni	12.85	12.85	0.54	0.65	0.00	0.00	1.74	1.81	0.86	0.98	2.15	2.15	2.69	2.80	2.60	2.79	0.54	0.65
				20.07%	23.21%	0.00%	0.00%					79.93%	76.79%			20.23%	21.71%	20.07%	23.21%
6	Niljai	17.61	17.61	1.46	1.75	0.13	0.13	2.11	2.23	1.25	1.31	2.99	3.09	4.58	4.97	3.49	3.67	1.59	1.88
				31.88%	35.21%	2.84%	2.62%					65.28%	62.17%			19.82%	20.84%	34.72%	37.83%
7	New Majri	7.74	7.74	1.64	1.82	0.24	0.28	0.97	1.04	1.47	1.47	2.22	2.27	4.10	4.37	2.68	2.79	1.88	2.10
				40.00%	41.65%	5.85%	6.41%					54.15%	51.95%			34.63%	36.05%	45.85%	48.05%
8	MKD-III	9.23	9.23	0.41	0.46	0.00	0.00	0.00	0.25	0.12	0.17	1.09	1.55	1.50	2.01	0.12	0.42	0.41	0.46
				27.33%	22.89%	0.00%	0.00%					72.67%	77.11%			1.30%	4.55%	27.33%	22.89%
9	Penganga	7.63	7.63	0.75	0.84	0.00	0.00	0.49	0.50	0.55	0.68	1.25	1.42	2.00	2.26	1.04	1.18	0.75	0.84
				37.50%	37.17%	0.00%	0.00%					62.50%	62.83%			13.63%	15.47%	37.50%	37.17%
10	Yekona-I&II(Amal)	16.79	16.79	0.01	0.20	0.00	0.00	0.00	0.00	0.03	0.08	1.29	1.64	1.30	1.84	0.03	0.08	0.01	0.20
				0.77%	10.87%	0.00%	0.00%					99.23%	89.13%			0.18%	0.48%	0.77%	10.87%
11	New Majri UG to OC	7.06	7.06	0.00	0.00	0.00	0.00	0.27	0.35	0.37	0.46	1.06	1.44	1.06	1.44	0.64	0.81	0.00	0.00
				0.00%	0.00%	0.00%	0.00%					100.00%	100.00%			9.07%	11.47%	0.00%	0.00%
12	Pauni -II (Expn)	10.95	10.95	0.00	0.00	0.00	0.00	0.18	0.25	0.22	0.30	1.34	1.74	1.34	1.74	0.40	0.55	0.00	0.00
				0.00%	0.00%	0.00%	0.00%					100.00%	100.00%			3.65%	5.02%	0.00%	0.00%
13	MKD -1 (Expn) OC	6.14	6.14	0.00	0.00	0.00	0.00	0.10	0.10	0.00	0.00	1.57	1.86	1.57	1.86	0.10	0.10	0.00	0.00
				0.00%	0.00%	0.00%	0.00%					100.00%	100.00%			1.63%	1.63%	0.00%	0.00%
	Total-A	**142.70**	**144.62**	**11.61**	**12.75**	**3.96**	**4.14**	**13.70**	**14.87**	**9.67**	**10.39**	**21.67**	**24.61**	**37.24**	**41.50**	**27.33**	**29.40**	**15.57**	**16.89**
				31.18%	30.72%	10.63%	9.98%					58.19%	59.30%			19.15%	20.33%	41.81%	40.70%

Note : In reference of the above Table-1, different parameters are classified as follows

1 Area under Biological Reclamation includes area under plantation done on backfilled area only.

2 Area under Technical Reclamation includes areas under barren backfill only.

3 Area under Active Mining includes coal quarry, advance quarry & quarry filled with water etc.

4 Social forestry and plantation on external OB dump are not included in biological reclamation and are put under other plantation.

5 % claculated in respect to total excaveted area except for "Total area under plantation" where % is in terms of leasehold area.

Table-1

Projectwise Land Reclamation Status in Opencast Projects of WCL

(> 5 Million Cubic Metre Coal+OB) based on Satellite Data of the year 2024

(Area in Sq. Kms.)

Sl. No.	Project	Total Leasehold Area		Technical Reclamation		Plantation						Area under Active Mining		Total Excavated Area		Total Area under Plantation (% Green Cover Generated in Leasehold)		Total Area under Reclamation	
						Biological Reclamation		Other Plantations											
				Area under Backfilling		Plantation on Excavated / Backfilled Area		Plantation on External Over Burden Dumps		Social Forestry, Avenue Plantation Etc.									
1	2	3		4		5		6		7		8		9(=4+5+8)		10(=5+6+7)		11(=4+5)	
		Prev cycle	2024	Prev cycle	2024	Prev cycle	2024	Prev cycle	2024	Prev cycle	2024	Prev cycle	2024	Prev cycle	2024	Prev cycle	2024	Prev cycle	2024
14	Bhatadi	8.47	8.47	0.39	0.44	0.00	0.00	0.50	0.59	0.43	0.48	0.97	1.12	1.36	1.56	0.93	1.07	0.39	0.44
				28.68%	28.21%	0.00%	0.00%					71.32%	71.79%			10.98%	12.63%	28.68%	28.21%
15	Bellora Naigaon	6.65	6.65	0.73	0.83	0.18	0.20	0.48	0.57	0.32	0.45	1.15	1.20	2.06	2.23	0.98	1.22	0.91	1.03
				35.44%	37.22%	8.74%	8.97%					55.83%	53.81%			14.74%	18.35%	44.17%	46.19%
16	Ballarpur	2.43	2.43	0.76	0.76	0.24	0.28	0.74	0.78	0.10	0.13	0.17	0.17	1.17	1.21	1.08	1.19	1.00	1.04
				64.96%	62.81%	20.51%	23.14%					14.53%	14.05%			44.44%	48.97%	85.47%	85.95%
17	Junad	4.50	4.50	0.37	0.41	0.05	0.12	0.75	0.81	0.34	0.38	0.66	0.67	1.08	1.20	1.14	1.31	0.42	0.53
				34.26%	34.17%	4.63%	10.00%					61.11%	55.83%			25.33%	29.11%	38.89%	44.17%
18	Kolarpimpiri	14.89	14.89	0.15	0.21	0.08	0.11	1.35	1.43	0.12	0.16	1.72	1.79	1.95	2.11	1.55	1.70	0.23	0.32
				7.69%	9.95%	4.10%	5.21%					88.21%	84.83%			10.41%	11.42%	11.79%	15.17%
19	HLOCM	3.12	3.12	0.64	0.65	0.06	0.10	0.74	0.76	0.31	0.37	0.48	0.54	1.18	1.29	1.11	1.23	0.70	0.75
				54.24%	50.39%	5.08%	7.75%					40.68%	41.86%			35.58%	39.42%	59.32%	58.14%
20	Gouri pouni	6.77	12.91	0.89	0.91	0.60	0.79	2.06	2.55	0.62	0.64	0.95	1.70	2.44	3.40	3.28	3.98	1.49	1.70
				36.48%	26.76%	24.59%	23.24%					38.93%	50.00%			48.45%	30.83%	61.07%	50.00%
21	Gondegaon	7.91	7.91	0.56	0.62	0.00	0.00	0.96	1.22	0.51	0.57	1.49	1.90	2.05	2.52	1.47	1.79	0.56	0.62
				27.32%	24.60%	0.00%	0.00%					72.68%	75.40%			18.58%	22.63%	27.32%	24.60%
22	Adasa UG to OC	5.64	5.64	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.27	0.57	0.80	0.57	0.80	0.14	0.27	0.00	0.00
				0.00%	0.00%	0.00%	0.00%					######	######			2.48%	4.79%	0.00%	0.00%
23	Bhanegaon	3.48	3.48	0.01	0.02	0.00	0.00	0.16	0.33	0.20	0.24	0.35	0.69	0.36	0.71	0.36	0.57	0.01	0.02
				2.78%	2.82%	0.00%	0.00%					97.22%	97.18%			10.34%	16.38%	2.78%	2.82%
24	Gokul	7.57	10.02	0.75	0.89	0.00	0.00	0.00	0.00	0.30	0.92	1.78	2.12	2.53	3.01	0.30	0.92	0.75	0.89
				29.64%	29.57%	0.00%	0.00%					70.36%	70.43%			3.96%	9.18%	29.64%	29.57%
25	Inder Kamptee Ama	11.25	7.95	1.12	0.75	0.09	0.34	0.76	1.41	0.85	0.31	1.47	1.62	2.68	2.71	1.70	2.06	1.21	1.09
				41.79%	27.68%	3.36%	12.55%					54.85%	59.78%			15.11%	25.91%	45.15%	40.22%
26	Dhuptala	-	10.14	-	0.00	-	0.00	-	0.25	-	0.30	-	1.74	-	1.74	-	0.55	-	0.00
				-	0.00%	-	0.00%					-	######			-	5.42%	-	0.00%
	Total-B	**82.68**	**98.11**	**6.37**	**6.49**	**1.30**	**1.94**	**8.50**	**10.70**	**4.24**	**5.22**	**11.76**	**16.06**	**19.43**	**24.49**	**14.04**	**17.86**	**7.67**	**8.43**
				32.78%	26.50%	6.69%	7.92%					60.52%	65.58%			16.98%	18.20%	39.48%	34.42%
	Total- (A+B)	**225.38**	**242.73**	**17.98**	**19.24**	**5.26**	**6.08**	**22.20**	**25.57**	**13.91**	**15.61**	**33.43**	**40.67**	**56.67**	**65.99**	**41.37**	**47.26**	**23.24**	**25.32**
				31.73%	29.16%	9.28%	9.21%					58.99%	61.63%			18.36%	19.47%	41.01%	38.37%

Note : In reference of the above Table-1, different parameters are classified as follows

1 Area under Biological Reclamation includes area under plantation done on backfilled area only.

2 Area under Technical Reclamation includes areas under barren backfill only.

3 Area under Active Mining includes coal quarry, advance quarry & quarry filled with water etc.

4 Social forestry and plantation on external OB dump are not included in biological reclamation and are put under other plantation.

5 % claculated in respect to total excaveted area except for "Total area under plantation" where % is in terms of leasehold area.

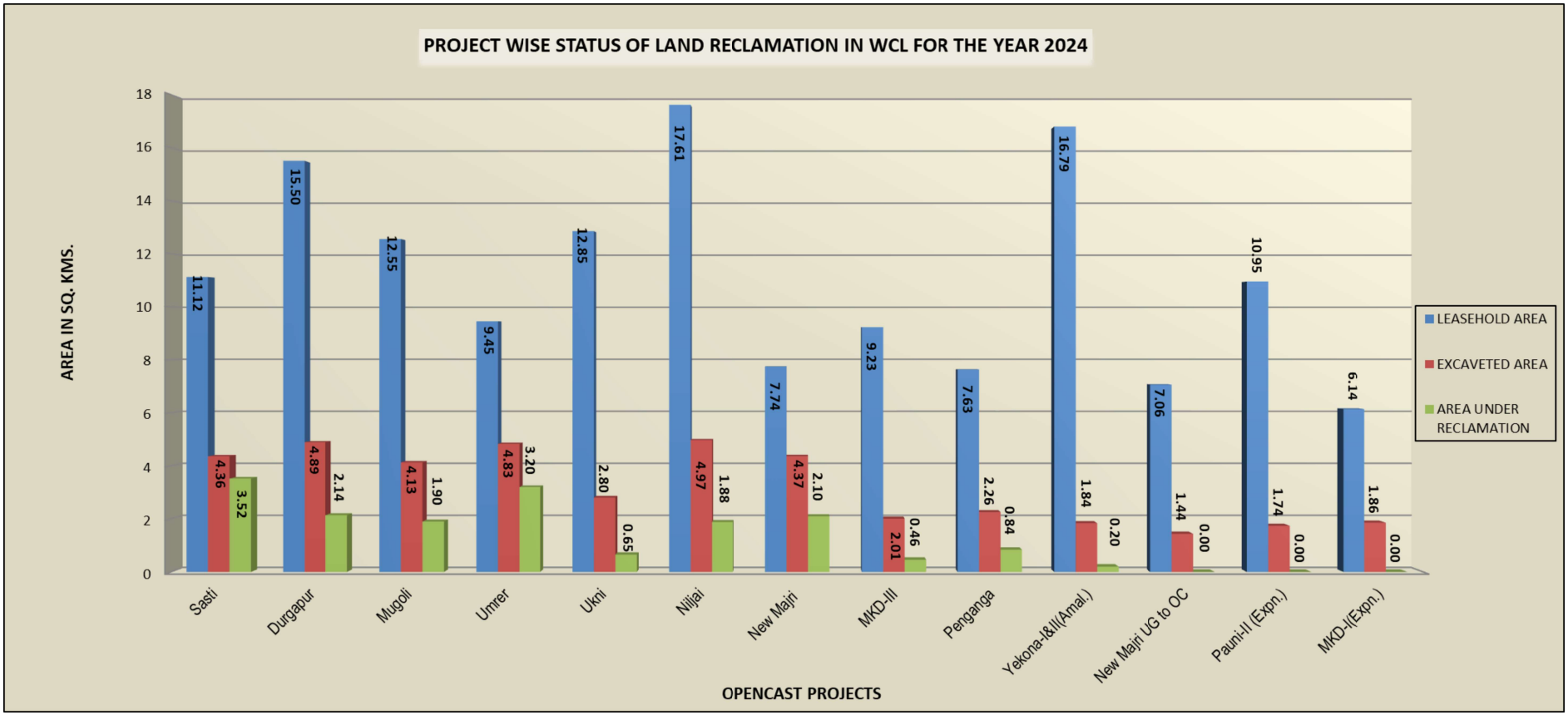


Fig.2: Land reclamation status in 14 OC projects of WCL for the year 2024

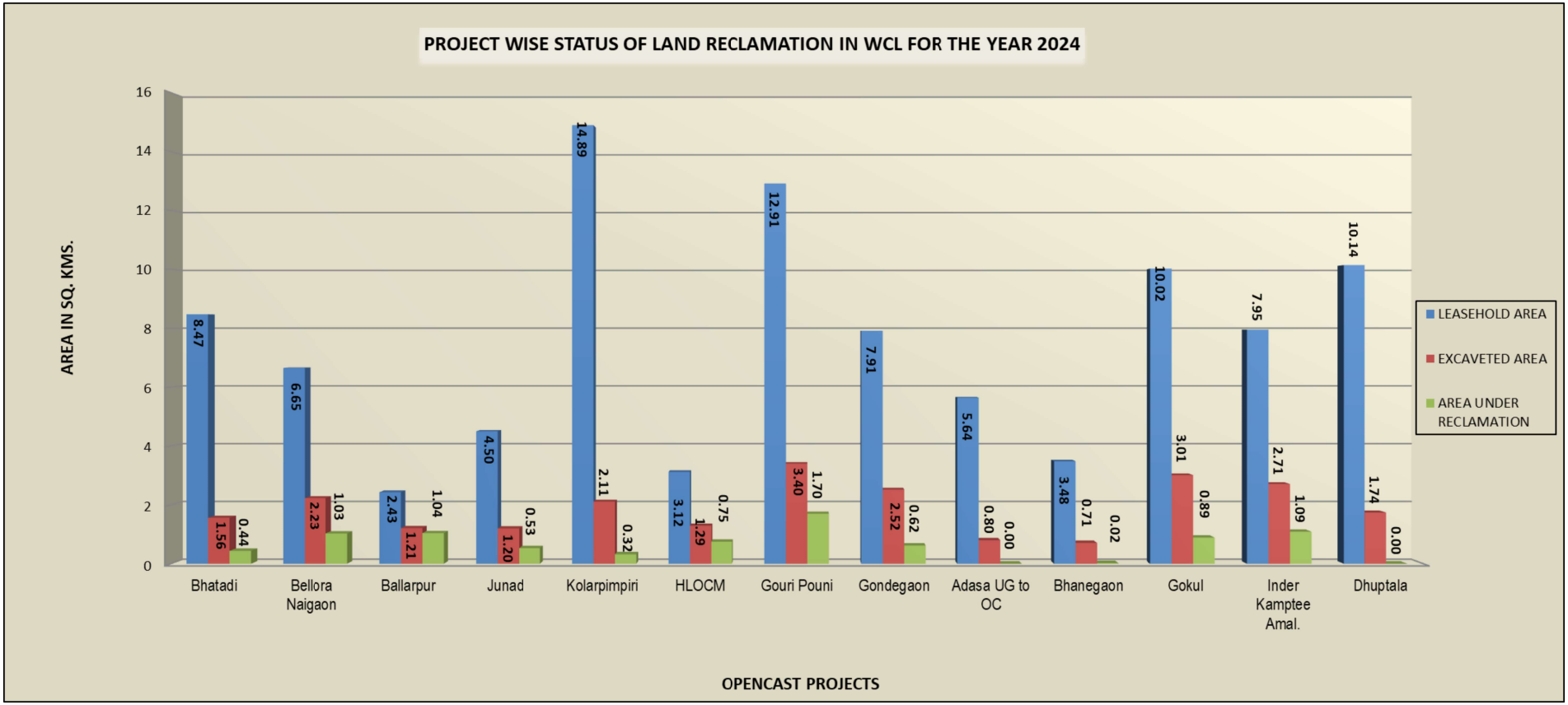


Fig.2: Land reclamation status in 14OC projects of WCL for the year 2024

1.0 Background

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

1.2 Keeping above in view, Coal India Ltd. (CIL) issued a work order vide letter no. CIL/WBP/Env/2009/2428dated 29.12.2009 to Central Mine Planning & Design Institute (CMPDI), Ranchi, for monitoring land reclamation. status of all the opencast coal mines having production of more than 5 million m^3 per annum (coal + OB taken together per annum) based on remote sensing satellite data, regularly on annual basis for sustainable development of mining. Further, another work order vide letter no. CIL/WBP/ENV./2011dated23/08/11was issued by CIL for monitoring of less than 5 million m^3 per annum capacity (Coal +OB) projects from the year 2011 at interval of three years. This order has been renewed in CIL letter no. CIL/WBP/Env/2011/4706dated 12.10.2012 for the next five years. Again this work order has been renewed vide letter no. CIL/WBP/Env/2017/DP/8391 dated 22.06.2017 for a period next five years starting from 2017-18 to 2021-22. The work order was renewed vide letter no. CIL/ ENVT/2022-23/W. O/10899 dated 06.07.2022 for a period of 2 more years from 2022-23 to 2023-24. Again the above work order has been renewed vide letter no. CIL/ ENV/11463 dated 03.07.2024 for a period of 3 more years for 2024-25, 2025-26 and 2026-27. The result of land reclamation status of all such mines is put on the websites of **CIL**, (www.coalindia.in), **CMPDI** (www.cmpdi.co.in) and the concerned

coal companies in public domain. Detailed report is submitted to Coal India and respective subsidiaries.

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

1.4 Present report is embodying the finding of the study based on satellite data of the year 2024 carried out for all the OC projects producing more than 5 mcm (Coal+OB) for Western Coalfields Ltd.

2.0 Objective

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

3.0 Methodology

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

is given in given in figure-3. Following steps are involved in land reclamation /restoration monitoring:

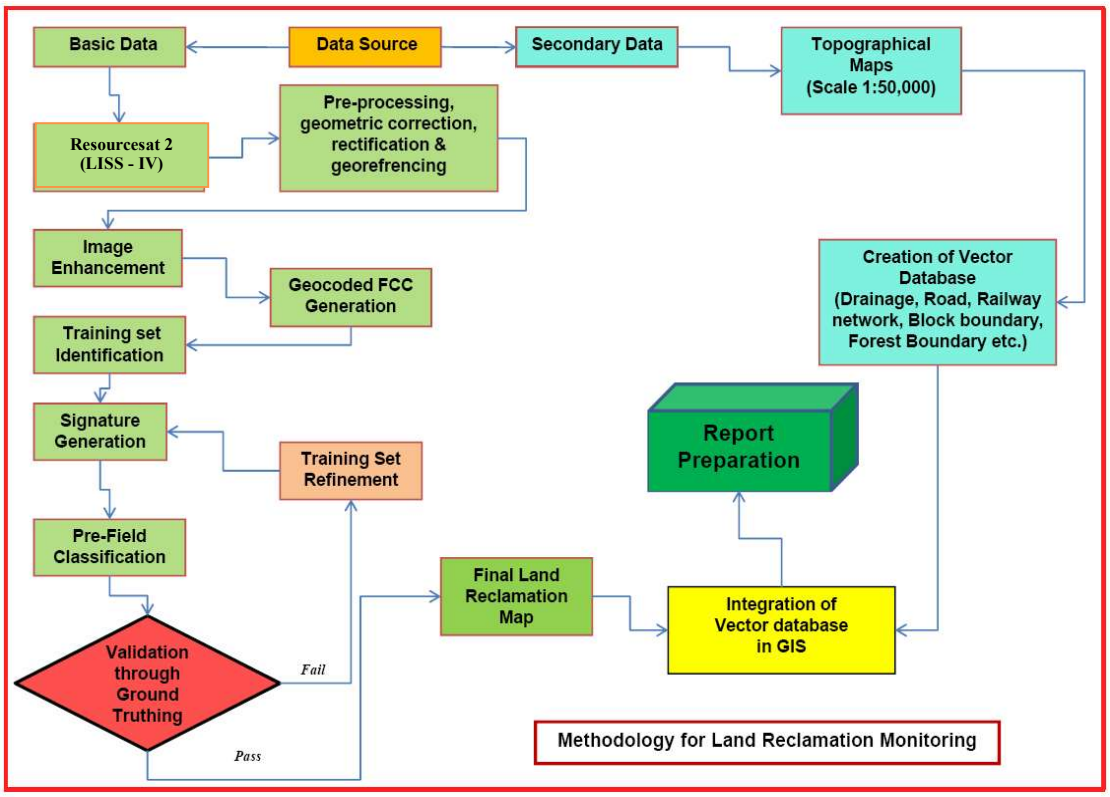


Figure: 3- ***Methodology for Land Reclamation Monitoring***

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

3.2 Satellite Data Processing: Satellite data are processed using ERDAS IMAGINE 2022 digital image processing s/w and ArcGIS. Methodology involves the following major steps:

- **Rectification & Georeferencing:** Inaccuracies in digital imagery may occur due to 'systematic errors' attributed to earth curvature and rotation as well as 'non-systematic errors' attributed to satellite receiving station itself. Raw digital

images contain geometric distortions, which make them unusable as maps. Therefore, georeferencing is required for correction of image data using ground control points (GCP) to make it compatible to SoI toposheet.

- **Image enhancement:**

  To improve the interpretability of the raw data, image enhancement is necessary. Local operations modify the value of each pixel based on brightness value of neighbouring pixels using ERDAS IMAGINE 2022 s/w. and enhance the image quality for interpretation.

- **Training set selection**

  Training set requires to be selected, so that software can classify the image data accurately. The image data are analysed based on the interpretation keys. These keys are evolved from certain fundamental image-elements such as tone/colour, size, shape, texture, pattern, location, association and shadow. Based on the image-elements and other geo-technical elements like land form, drainage pattern and physiography; training sets were selected/identified for each land use/cover class. Field survey was carried out by taking selective traverses in order to collect the ground information (or reference data) so that training sets are selected accurately in the image. This was intended to serve as an aid for classification.

- **Classification and Accuracy assessment**

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

computing divergence matrix. The overall accuracy of the classification was finally assessed with reference to ground truth data.

- **Area calculation**

  The area of each land use class in the leasehold is determined using ERDAS IMAGINE v.2022software.

- **Overlay of Vector data base**

  Vector data base created based on secondary data. Vector layer like drainage, railway line, leasehold boundary, forest boundary etc. are superimposed on the image as vector layer in the ArcGIS Pro 3.4 database.

- **Pre-field map preparation**

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

3.3 Ground Truthing:

Selective ground verification of the land use classes is carried out in the field and necessary corrections if required, are incorporated before map finalization.

3.4 Land reclamation database on GIS:

Land reclamation database is created on GIS platform to identify the temporal changes identified from satellite data of different cut-of dates.

4.0 Work Plan

Twenty-six opencast projects of WCL producing more than 5 million cubic m. (Coal + OB together) have been taken up for land reclamation/ restoration monitoring in 2023-24, based on the Resoursesat-2/2A(L-IV) Satellite data, using

ERDAS Imaging digital image processing s/w, ArcGIS 10.2 and ArcGIS Pro 3.4 platform. Land reclamation monitoring will be carried out regularly on annual basis to assess the progressive status of land reclamation/ restoration in the above OC mines. The report of this study has been uploaded on the websites of CMPDI, CIL & WCL in public domain.

5.0 Land Reclamation Status in Western Coalfields Limited

5.1 Following 26 OC projects producing more than 5 million cubic m. (Coal + OB together) of Western Coalfields Ltd. have been taken up for land reclamation monitoring based on Satellite Data of the year 2024:

- Sasti
- Durgapur
- Mungoli
- Umrer
- Ukni
- Niljai
- New Majri
- MKD-III
- Penganga
- Yekona I&II Amal
- New Majri UG to OC
- Pauni-II (Expn.)
- MKD-I Expn.
- Bhatadi
- Bellora Naigaon
- Ballarpur
- Junad
- Kolarpimpiri
- HLOCM)
- Gauri Pauni
- Gondegaon
- Adasa UG to OC
- Bhanegaon
- Gokul
- Inder Kamptee Amal
- Dhuptala

5.2 Project wise Land Reclamation status in WCL for the year 2024 is given in Table 1 and also shown graphically in Fig 1. Area statistics of different land use class present in the mine leasehold of the above projects for the year 2024 are shown in the Table 2. Land use maps derived from satellite data are shown in Plate 1-26. This time both local grid and UTM grid is used for map preparation along with all essential

boundaries shape file such as Quarry limit line, Sump, OB Dump, EC Boundary, Plantation area etc. as per the work order from CIL. Year wise changes in the different land use classes based on satellite data are depicted in Bar Charts in Fig.4–29 for the last three years only excluding Dhuptala OC (Sasti UG to OC) as this mine been consider for the land reclamation for the first time in Yr. 2024-25.

5.3 Study reveals that 25.32 Km^2 (38.37%) of excavated area has been under reclamation in the above mentioned mines of WCL out of which 6.08 Km^2(9.21%) area has been revegetated and 19.24 Km^2 (29.16%) area is under backfilling. There is an overall increase of 2.08 Km^2 in area under reclamation in WCL in the year 2024 with respect to the year 2023, out of which there is an increase of 1.26 Km^2 in area under technical reclamation (Barren Backfilling) and an increase of 0.82 Km^2 in area under biological reclamation (Plantation on Backfilled Areas) (Refer Table-1).

In Sasti OC project, plantation on OB has been reduced by 0.11 Km^2 on account of tree felling and re-handling of backfill for the purpose of coal mining. In Durgapur OC and Umrer OC projects backfill has been reduced by 0.08 Km^2 and 0.04 Km^2 respectively as backfill has been converted to biological reclamation. In Inder Kamptee Amalgamated OC project total lease hold area have been decreased from 11.25 Km^2 to 7.95 Km^2. In previous cycle Inder OC project and Kamptee OC project had been analyzed separately in different year.

5.4 Analysis of satellite data also indicates that total area under active mining has increased from 33.43 Km^2 (Yr.2023) to 40.67 Km^2 (Yr.2024). In Umrer OC project area under active mining has reduced due to increase in area under backfilling.

5.5 After comparing the satellite data of year 2024 vs. 2023, study also reveals that area under backfilling has increased from 17.98 Km^2 (Yr.2023) to 19.24 Km^2 (Yr.2024).

5.6 Total area under biological reclamation has increased from 5.26 Km^2 (Yr.2023) to 6.08 Km^2 (Yr.2024). There is no biological reclamation in Yekona-I&II (Amal.), New Majri UG to OC, Pauni-II (Expn.), Bhatadi, MKD-I and MKD-III OC, Gondegaon, Adasa UG to OC, Bhanegaon, Gokul, Dhuptala & Penganga OC.

5.7 Analysis of satellite data also indicates that total area under plantation (Green Cover) has increased from 41.37 Km^2 (Yr.2023) to 47.26 Km^2 (Yr.2024). The increase of 5.89 Km^2 area under Green Cover areas may be attributed to continuous effort of WCL towards environmental protection.

5.8 After comparing the satellite data of year 2024 vs. 2023, it is evident that total area under plantation (Green Cover) in all 26 Opencast Projects has increased. It has been also observed in some of the projects natural vegetation has also started growing on stabilized old backfilled areas and overburden dumps due to high soil fertility.

5.9 On comparing the status of land reclamation for the year 2024 with respect to the year 2023 in different projects, it is evident that the total area under reclamation has increased from 23.24 Km^2 (Yr. 2023) to 25.32 Km^2 (Yr. 2023).

5.10 Out of 26 projects of WCL, maximum area under reclamation is in Ballarpur Opencast Project (85.95%) followed by Sasti OC (80.73%) and Umrer OC (66.25%).

TABLE - 2

Status of Land Use / Reclamation in OC Mines(>5mcu.m) of Western Coalfields Ltd based on Satellite data of the Year 2024

(Area in Sq.Km)

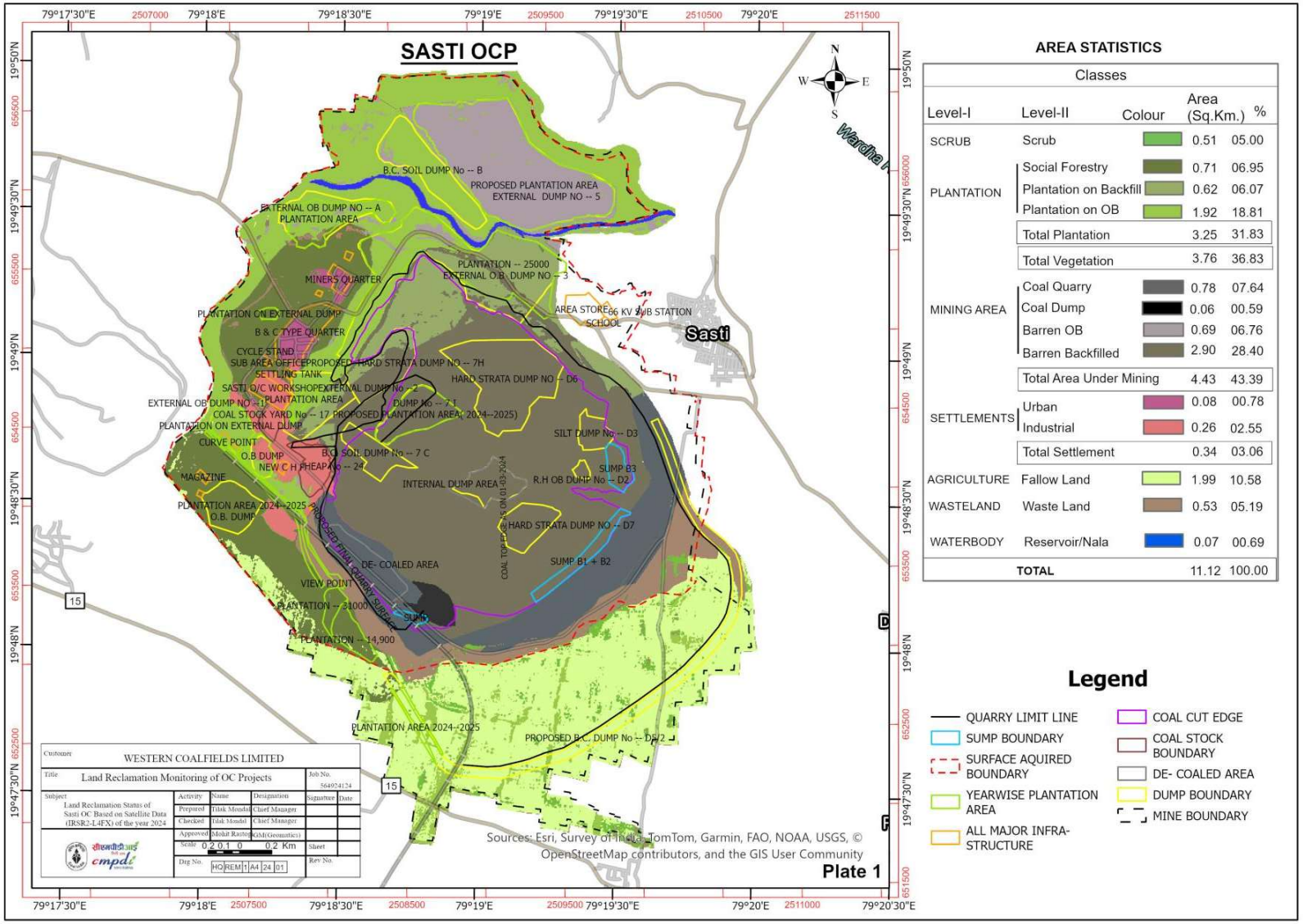
		Sasti		Durgapur		Mungoli		Umrer		Ukni		Niljai		New Majri		MKD-III		Penganga		Yekona-I&II (Amal)		New Majri Ug to OC		Pauni -II (Expn)		MKD-I (Expn.)		Total	
		Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%
FORESTS	Dense Forest	0.00	0.00	1.27	8.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.27	0.88
	Open Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Forest	0.00	0.00	1.27	8.19	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	0.00	**0.00**	**0.00**	**0.00**	0.00	**0.00**	**1.27**	**0.88**
SCRUBS	Scrubs	**0.51**	**5.00**	**0.48**	**3.10**	**1.62**	**12.91**	**0.00**	**0.00**	**1.53**	**11.91**	**1.34**	**7.61**	**0.06**	**0.78**	**0.54**	**5.85**	**0.71**	**9.31**	**1.99**	**11.85**	**0.68**	**9.63**	**0.97**	**8.86**	**0.75**	**12.21**	**11.18**	**7.78**
PLANTATION	Social Forestry	0.71	6.95	1.26	8.13	0.65	5.18	2.32	24.55	0.98	7.63	1.31	7.44	1.47	18.99	0.17	1.84	0.68	8.91	0.08	0.48	0.46	6.52	0.30	2.74	0.00	0.00	10.39	7.23
	Plantation on OB Dump	1.92	18.81	2.99	19.29	1.98	15.78	1.45	15.34	1.81	14.09	2.23	12.66	1.04	13.44	0.25	2.71	0.50	6.55	0.00	0.00	0.35	4.96	0.25	2.28	0.10	1.63	14.87	10.35
	Plantation on Backfill (Biological Reclamation)	0.62	6.07	1.18	7.61	0.20	1.59	1.73	18.31	0.00	0.00	0.13	0.74	0.28	3.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.14	2.88
	Total Plantation	**3.25**	**31.83**	**5.43**	**35.03**	**2.83**	**22.55**	**5.50**	**58.20**	**2.79**	**21.71**	**3.67**	**20.84**	**2.79**	**36.05**	**0.42**	**4.55**	**1.18**	**15.47**	**0.08**	**0.48**	**0.81**	**11.47**	**0.55**	**5.02**	**0.10**	**1.63**	**29.40**	**20.46**
	Total Vegetation	**3.76**	**36.83**	**7.18**	**46.32**	**4.45**	**35.46**	**5.50**	**58.20**	**4.32**	**33.62**	**5.01**	**28.45**	**2.85**	**36.82**	**0.96**	**10.40**	**1.89**	**24.77**	**2.07**	**12.33**	**1.49**	**21.10**	**1.52**	**13.88**	**0.85**	**13.84**	**41.85**	**29.12**
ACTIVE MINING	Coal Quarry	0.78	7.64	2.25	14.52	2.23	17.77	1.52	16.08	1.99	15.49	3.00	17.04	2.27	29.33	1.55	16.79	1.19	15.60	1.43	8.52	1.31	18.56	1.54	14.06	1.86	30.29	22.92	15.95
	Coal Dump	0.06	0.59	0.05	0.32	0.00	0.00	0.10	1.06	0.10	0.78	0.05	0.28	0.00	0.00	0.00	0.00	0.23	3.01	0.21	1.25	0.13	1.84	0.20	1.83	0.00	0.00	1.13	0.79
	Advance Quarry Site	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Quarry Filled With Water	0.00	0.00	0.45	2.90	0.00	0.00	0.01	0.11	0.06	0.47	0.04	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.39
	Total Area under *Active Mining*	**0.84**	**8.23**	**2.75**	**17.74**	**2.23**	**17.77**	**1.63**	**17.25**	**2.15**	**16.73**	**3.09**	**17.55**	**2.27**	**29.33**	**1.55**	**16.79**	**1.42**	**18.61**	**1.64**	**9.77**	**1.44**	**20.40**	**1.74**	**15.89**	**1.86**	**30.29**	**24.61**	**17.12**
	Barren OB Dump	0.69	6.76	1.77	11.42	2.15	17.13	0.12	1.27	3.73	29.03	4.46	25.33	0.31	4.01	2.55	27.63	1.35	17.69	2.04	12.15	0.84	11.90	3.17	28.95	0.78	12.70	23.96	16.67
	Barren Backfilled Area (Technical Reclamation)	2.90	28.40	0.96	6.19	1.70	13.55	1.47	15.56	0.65	5.06	1.75	9.94	1.82	23.51	0.46	4.98	0.84	11.01	0.03	0.18	0.00	0.00	0.00	0.00	0.00	0.00	12.58	8.75
	Total Area	**3.59**	**35.16**	**2.73**	**17.61**	**3.85**	**30.68**	**1.59**	**16.83**	**4.38**	**34.09**	**6.21**	**35.26**	**2.13**	**27.52**	**3.01**	**32.61**	**2.19**	**28.70**	2.07	12.33	0.84	11.90	3.17	28.95	0.78	12.70	36.54	25.43
	Total Area Under Mine Operation	**4.43**	**43.39**	**5.48**	**35.35**	**6.08**	**48.45**	**3.22**	**34.07**	**6.53**	**50.82**	**9.30**	**52.81**	**4.40**	**56.85**	**4.56**	**49.40**	**3.61**	**47.31**	**3.71**	**22.10**	**2.28**	**32.29**	**4.91**	**44.84**	**2.64**	**43.00**	**61.15**	**42.55**
WASTELANDS	Waste Lands	0.53	5.19	1.16	7.48	0.23	1.83	0.27	2.86	0.75	5.84	0.79	4.49	0.10	1.29	0.15	1.63	1.65	21.63	1.26	7.50	0.26	3.68	0.33	3.01	0.11	1.79	7.59	5.28
	Fly Ash Pond / Sand Body	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.71	0.05	0.46	0.00	0.00	0.10	0.07
	Total Wasteland	**0.53**	**5.19**	**1.16**	**7.48**	**0.23**	**1.83**	**0.27**	**2.86**	**0.75**	**5.84**	**0.79**	**4.49**	**0.10**	**1.29**	**0.15**	**1.63**	**1.65**	**21.63**	**1.26**	**7.50**	**0.31**	**4.39**	**0.38**	**3.47**	**0.11**	**1.79**	**7.69**	**5.35**
WATERBODIES	Reservoir, nallah, ponds	0.07	0.69	0.05	0.32	0.00	0.00	0.20	2.12	0.00	0.00	0.03	0.17	0.01	0.13	0.00	0.00	0.12	1.57	0.10	0.60	0.03	0.42	0.22	2.01	0.07	1.14	0.90	0.63
	Total Waterbodies	**0.07**	**0.69**	**0.05**	**0.32**	**0.00**	**0.00**	**0.20**	**2.12**	**0.00**	**0.00**	**0.03**	**0.17**	**0.01**	**0.13**	**0.00**	**0.00**	**0.12**	**1.57**	**0.10**	**0.60**	**0.03**	**0.42**	**0.22**	**2.01**	**0.07**	**1.14**	0.90	0.63
AGRICULTURE	Crop Lands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	10.08	0.00	0.00	3.26	19.42	0.87	12.32	0.46	4.20	0.51	8.31	6.03	4.20
	Fallow Lands	1.08	10.58	1.04	6.71	1.46	11.63	0.00	0.00	1.05	8.17	1.45	8.23	0.00	0.00	2.42	26.22	0.21	2.75	6.34	37.76	2.00	28.33	3.33	30.41	1.96	31.92	22.34	15.55
	Total Agriculture	**1.08**	**10.58**	**1.04**	**6.71**	**1.46**	**11.63**	**0.00**	**0.00**	**1.05**	**8.17**	**1.45**	**8.23**	**0.00**	**0.00**	**3.35**	**36.29**	**0.21**	**2.75**	**9.60**	**57.18**	**2.87**	**40.65**	**3.79**	**34.61**	**2.47**	**40.23**	**28.37**	**19.74**
SETTLEMENTS	Urban Settlement	0.08	0.78	0.39	2.52	0.12	0.96	0.15	1.59	0.00	0.00	0.34	1.93	0.34	4.39	0.00	0.00	0.00	0.00	0.01	0.06	0.07	0.99	0.00	0.00	0.00	0.00	1.50	1.04
	Rural Settlement	0.00	0.00	0.05	0.32	0.03	0.24	0.00	0.00	0.02	0.16	0.20	1.14	0.00	0.00	0.00	0.00	0.03	0.39	0.03	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.25
	Industrial Settlement	0.26	2.55	0.15	0.97	0.18	1.43	0.11	1.16	0.18	1.40	0.49	2.78	0.04	0.52	0.21	2.28	0.12	1.57	0.01	0.06	0.01	0.14	0.13	1.19	0.00	0.00	1.89	1.32
	Total Settlement	**0.34**	**3.33**	**0.59**	**3.81**	**0.33**	**2.63**	**0.26**	**2.75**	**0.20**	**1.56**	**1.03**	**5.85**	**0.38**	**4.91**	**0.21**	**2.28**	**0.15**	**1.97**	**0.05**	**0.30**	**0.08**	**1.13**	**0.13**	**1.19**	0.00	**0.00**	3.75	2.61
	Grand Total	**10.21**	**100.00**	**15.50**	**100.00**	**12.55**	**100.00**	**9.45**	**100.00**	**12.85**	**100.00**	**17.61**	**100.00**	**7.74**	**100.00**	**9.23**	**100.00**	**7.63**	**100.00**	**16.79**	**100.00**	**7.06**	**100.00**	**10.95**	**100.00**	**6.14**	**100.00**	**143.71**	**100.00**

TABLE - 2

Status of Land Use / Reclamation in OC Mines(>5mcu.m) of Western Coalfields Ltd based on Satellite data of the Year 2024

(Area in Sq.Km)

		Bhatadi		Bellora Naigaon		Ballarpur		Junad		Kolar Pimpiri		HLOCM		Gauri-Pouni		Gondegaon		Adasa UG to OC		Dhuptala		Gokul		Bhanegaon		Inder Kamptee		Total	
		Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%
FORESTS	Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Open Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Forest	0.00	0.00	0.00	0.00	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	0.00	**0.00**	**0.00**	**0.00**	0.00	**0.00**
SCRUBS	Scrubs	**0.97**	**11.45**	**0.53**	**7.97**	**0.01**	**0.41**	**0.51**	**11.33**	**2.40**	**16.12**	**0.02**	**0.64**	**0.86**	**6.66**	**0.33**	**4.17**	**0.82**	**14.54**	**1.07**	**10.55**	**1.06**	**10.58**	**0.13**	**3.74**	**0.75**	**12.21**	**9.46**	**9.82**
PLANTATION	Social Forestry	0.48	5.67	0.45	6.77	0.13	5.35	0.38	8.44	0.16	1.07	0.37	11.86	0.64	4.96	0.57	7.21	0.27	4.79	0.41	4.04	0.92	9.18	0.24	6.90	0.00	0.00	5.02	5.21
	Plantation on OB Dump	0.59	6.97	0.57	8.57	0.78	32.10	0.81	18.00	1.43	9.60	0.76	24.36	2.55	19.75	1.22	15.42	0.00	0.00	0.78	7.69	0.00	0.00	0.33	9.48	0.10	1.63	9.92	10.30
	Plantation on Backfill (Biological Reclamation)	0.00	0.00	0.20	3.01	0.28	11.52	0.12	2.67	0.11	0.74	0.10	3.21	0.79	6.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.60	1.66
	Total Plantation	**1.07**	**12.63**	**1.22**	**18.35**	**1.19**	**48.97**	**1.31**	**29.11**	**1.70**	**11.42**	**1.23**	**39.42**	**3.98**	**30.83**	**1.79**	**22.63**	**0.27**	**4.79**	**1.19**	**11.74**	**0.92**	**9.18**	**0.57**	**16.38**	**0.10**	**1.63**	**16.54**	**17.18**
	Total Vegetation	**2.04**	**24.09**	**1.75**	**26.32**	**1.20**	**49.38**	**1.82**	**40.44**	**4.10**	**27.54**	**1.25**	**40.06**	**4.84**	**37.49**	**2.12**	**26.80**	**1.09**	**19.33**	**2.26**	**22.29**	**1.98**	**19.76**	**0.70**	**20.11**	**0.85**	**13.84**	**26.00**	**27.00**
ACTIVE MINING	Coal Quarry	0.97	11.45	1.17	17.59	0.13	5.35	0.65	14.44	1.33	8.93	0.49	15.71	1.08	8.37	1.59	20.10	0.74	13.12	0.29	2.86	1.81	18.06	0.64	18.39	1.86	30.29	12.75	13.24
	Coal Dump	0.13	1.53	0.03	0.45	0.04	1.65	0.02	0.44	0.04	0.27	0.05	1.60	0.15	1.16	0.07	0.88	0.06	1.06	0.04	0.39	0.26	2.59	0.02	0.57	0.00	0.00	0.91	0.94
	Advance Quarry Site	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.89	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.09
	Quarry Filled With Water	0.02	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.42	2.82	0.00	0.00	0.47	3.64	0.24	3.03	0.00	0.00	0.04	0.39	0.05	0.50	0.03	0.86	0.00	0.00	1.27	1.32
	Total Area under *Active Mining*	**1.12**	**13.22**	**1.20**	**18.05**	**0.17**	**7.00**	**0.67**	**14.89**	**1.79**	**12.02**	**0.54**	**17.31**	**1.70**	**13.17**	**1.90**	**24.02**	**0.80**	**14.18**	**0.46**	**4.54**	**2.12**	**21.16**	**0.69**	**19.83**	**1.86**	**30.29**	**15.02**	**15.60**
	Barren OB Dump	1.77	20.90	0.45	6.77	0.19	7.82	1.15	25.56	3.58	24.04	0.31	9.94	0.90	6.97	1.62	20.48	0.97	17.20	1.18	11.64	1.52	15.17	0.96	27.59	0.78	12.70	15.38	15.97
	Barren Backfilled Area (Technical Reclamation)	0.44	5.19	0.83	12.48	0.76	31.28	0.41	9.11	0.21	1.41	0.65	20.83	0.91	7.05	0.62	7.84	0.00	0.00	0.00	0.00	0.89	8.88	0.02	0.57	0.00	0.00	5.74	5.96
	Total Area	**2.21**	**26.09**	**1.28**	**19.25**	**0.95**	**39.09**	**1.56**	**34.67**	**3.79**	**25.45**	**0.96**	**30.77**	**1.81**	**14.02**	**2.24**	**28.32**	**0.97**	**17.20**	1.18	11.64	2.41	24.05	0.98	28.16	0.78	12.70	21.12	21.93
	Total Area Under Mine Operation	**3.33**	**39.32**	**2.48**	**37.29**	**1.12**	**46.09**	**2.23**	**49.56**	**5.58**	**37.47**	**1.50**	**48.08**	**3.51**	**27.19**	**4.14**	**52.34**	**1.77**	**31.38**	**1.64**	**16.17**	**4.53**	**45.21**	**1.67**	**47.99**	**2.64**	**43.00**	**36.14**	**37.53**
WASTELANDS	Waste Lands	0.57	6.73	0.27	4.06	0.03	1.23	0.22	4.89	0.65	4.37	0.11	3.53	0.41	3.18	0.50	6.32	0.46	8.16	0.68	6.71	0.47	4.69	0.25	7.18	0.11	1.79	4.73	4.91
	Fly Ash Pond / Sand Body	0.05	0.59	0.05	0.75	0.02	0.00	0.04	0.89	0.03	0.20	0.00	0.00	0.06	0.46	0.00	0.00	0.04	0.71	0.05	0.49	0.00	0.00	0.03	0.86	0.00	0.00	0.37	0.38
WATERBODIES	**Total Wasteland**	**0.62**	**7.32**	**0.32**	**4.81**	**0.05**	**1.23**	**0.26**	**5.78**	**0.68**	**4.57**	**0.11**	**3.53**	**0.47**	**3.64**	**0.50**	**6.32**	**0.50**	**8.87**	**0.73**	**7.20**	**0.47**	**4.69**	**0.28**	**8.05**	**0.11**	**1.79**	**5.10**	**5.30**
	Reservoir, nallah, ponds	0.15	1.77	0.02	0.30	0.02	0.82	0.04	0.89	0.02	0.13	0.08	2.56	0.02	0.15	0.00	0.00	0.05	0.89	0.11	1.08	0.02	0.20	0.08	2.30	0.07	1.14	0.68	0.71
	Total Waterbodies	**0.15**	**1.77**	**0.02**	**0.30**	**0.02**	**0.82**	**0.04**	**0.89**	**0.02**	**0.13**	**0.08**	**2.56**	**0.02**	**0.15**	**0.00**	**0.00**	**0.05**	**0.89**	**0.11**	**1.08**	**0.02**	**0.20**	**0.08**	**2.30**	**0.07**	**1.14**	0.68	0.71
AGRICULTURE	Crop Lands	0.00	0.00	0.50	7.52	0.00	0.00	0.00	0.00	0.35	2.35	0.00	0.00	0.00	0.00	0.00	0.00	0.70	12.41	1.67	16.47	0.00	0.00	0.00	0.00	0.51	8.31	3.73	3.87
	Fallow Lands	2.25	26.56	1.58	23.76	0.02	0.82	0.12	2.67	3.99	26.80	0.04	1.28	3.94	30.52	1.08	13.65	1.45	25.71	3.56	35.11	2.80	27.94	0.67	19.25	1.96	31.92	23.46	24.36
	Total Agriculture	**2.25**	**26.56**	**2.08**	**31.28**	**0.02**	**0.82**	**0.12**	**2.67**	**4.34**	**29.15**	**0.04**	**1.28**	**3.94**	**30.52**	**1.08**	**13.65**	**2.15**	**38.12**	**5.23**	**51.58**	**2.80**	**27.94**	**0.67**	**19.25**	**2.47**	**40.23**	**27.19**	**28.23**
SETTLEMENTS	Urban Settlement	0.02	0.24	0.00	0.00	0.01	0.41	0.01	0.22	0.01	0.07	0.13	4.17	0.00	0.00	0.04	0.51	0.04	0.71	0.07	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.34
	Rural Settlement	0.04	0.47	0.00	0.00	0.00	0.00	0.01	0.22	0.06	0.40	0.00	0.00	0.05	0.39	0.00	0.00	0.03	0.53	0.02	0.20	0.16	1.60	0.00	0.00	0.00	0.00	0.37	0.38
	Industrial Settlement	0.02	0.24	0.00	0.00	0.01	0.41	0.01	0.22	0.10	0.67	0.01	0.32	0.08	0.62	0.03	0.38	0.01	0.18	0.08	0.79	0.06	0.60	0.08	2.30	0.00	0.00	0.49	0.51
	Total Settlement	**0.08**	**0.94**	**0.00**	**0.00**	**0.02**	**0.82**	**0.03**	**0.67**	**0.17**	**1.14**	**0.14**	**4.49**	**0.13**	**1.01**	**0.07**	**0.88**	**0.08**	**1.42**	**0.17**	**1.68**	**0.22**	**2.20**	**0.08**	**2.30**	0.00	**0.00**	1.19	1.24
	Grand Total	**8.47**	**100.00**	**6.65**	**100.00**	**2.43**	**99.18**	**4.50**	**100.00**	**14.89**	**100.00**	**3.12**	**100.00**	**12.91**	**100.00**	**7.91**	**100.00**	**5.64**	**100.00**	**10.14**	**100.00**	**10.02**	**100.00**	**3.48**	**100.00**	**6.14**	**100.00**	**96.30**	**100.00**


SASTI OCP
Sasti
Wardha R
B.C. SOIL DUMP No -- B
PROPOSED PLANTATION AREA
EXTERNAL DUMP NO -- 5
EXTERNAL OB DUMP NO -- A
PLANTATION AREA
MINERS QUARTER
PLANTATION -- 25000
EXTERNAL O.B. DUMP NO -- 3
PLANTATION ON EXTERNAL DUMP
B & C TYPE QUARTER
AREA STORE
66 KV S/S STATION
SCHOOL
CYCLE STAND
SUB AREA OFFICE
SETTLING TANK
PROPOSED HARD STRATA DUMP NO -- 7H
HARD STRATA DUMP NO -- D6
SASTI O/C WORKSHOP
EXTERNAL DUMP No -- 2
PLANTATION AREA
EXTERNAL OB DUMP NO -- 1
DUMP No -- 7 T
COAL STOCK YARD No -- 17
PROPOSED PLANTATION AREA(2024--2025)
PLANTATION ON EXTERNAL DUMP
SILT DUMP No -- D3
CURVE POINT
O.B DUMP
B.C. SOIL DUMP No -- 7 C
NEW C H PHEAPA No -- 24
SUMP B3
R.H OB DUMP No -- D2
MAGAZINE
INTERNAL DUMP AREA
PLANTATION AREA 2024--2025 -3
O.B. DUMP
PROPOSED FINAL COAL CUT EDGE
HARD STRATA DUMP NO -- D7
DE- COALED AREA
SUMP B1 + B2
VIEW POINT
PLANTATION -- 31000
SUMP
PLANTATION -- 14,900
PLANTATION AREA 2024--2025
PROPOSED B.C. DUMP No -- D5/2
Sources: Esri, Survey of India, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
Plate 1
Customer: WESTERN COALFIELDS LIMITED
Title: Land Reclamation Monitoring of OC Projects
Job No. 564924124
Subject: Land Reclamation Status of Sasti OC Based on Satellite Data (IRSR2-L4FX) of the year 2024
Prepared: Tilak Mondal, Chief Manager
Checked: Tilak Mondal, Chief Manager
Approved: Mohit Rastogi, GM(Geomatics)
Scale: 0 0.2 0.1 0 0.2 Km
Dig No.: HQ REM 1 A4 24 01
Sheet
Rev No.
AREA STATISTICS
Classes
Level-I | Level-II | Colour | Area (Sq.Km.) | %
SCRUB | Scrub | 0.51 | 05.00
PLANTATION | Social Forestry | 0.71 | 06.95
Plantation on Backfill | 0.62 | 06.07
Plantation on OB | 1.92 | 18.81
Total Plantation | 3.25 | 31.83
Total Vegetation | 3.76 | 36.83
MINING AREA | Coal Quarry | 0.78 | 07.64
Coal Dump | 0.06 | 00.59
Barren OB | 0.69 | 06.76
Barren Backfilled | 2.90 | 28.40
Total Area Under Mining | 4.43 | 43.39
SETTLEMENTS | Urban | 0.08 | 00.78
Industrial | 0.26 | 02.55
Total Settlement | 0.34 | 03.06
AGRICULTURE | Fallow Land | 1.99 | 10.58
WASTELAND | Waste Land | 0.53 | 05.19
WATERBODY | Reservoir/Nala | 0.07 | 00.69
TOTAL | 11.12 | 100.00
Legend
QUARRY LIMIT LINE
SUMP BOUNDARY
SURFACE AQUIRED BOUNDARY
YEARWISE PLANTATION AREA
ALL MAJOR INFRA-STRUCTURE
COAL CUT EDGE
COAL STOCK BOUNDARY
DE- COALED AREA
DUMP BOUNDARY
MINE BOUNDARY
79°17'30"E
79°18'E
79°18'30"E
79°19'E
79°19'30"E
79°20'E
79°20'30"E
19°50'N
19°49'30"N
19°49'N
19°48'30"N
19°48'N
19°47'30"N

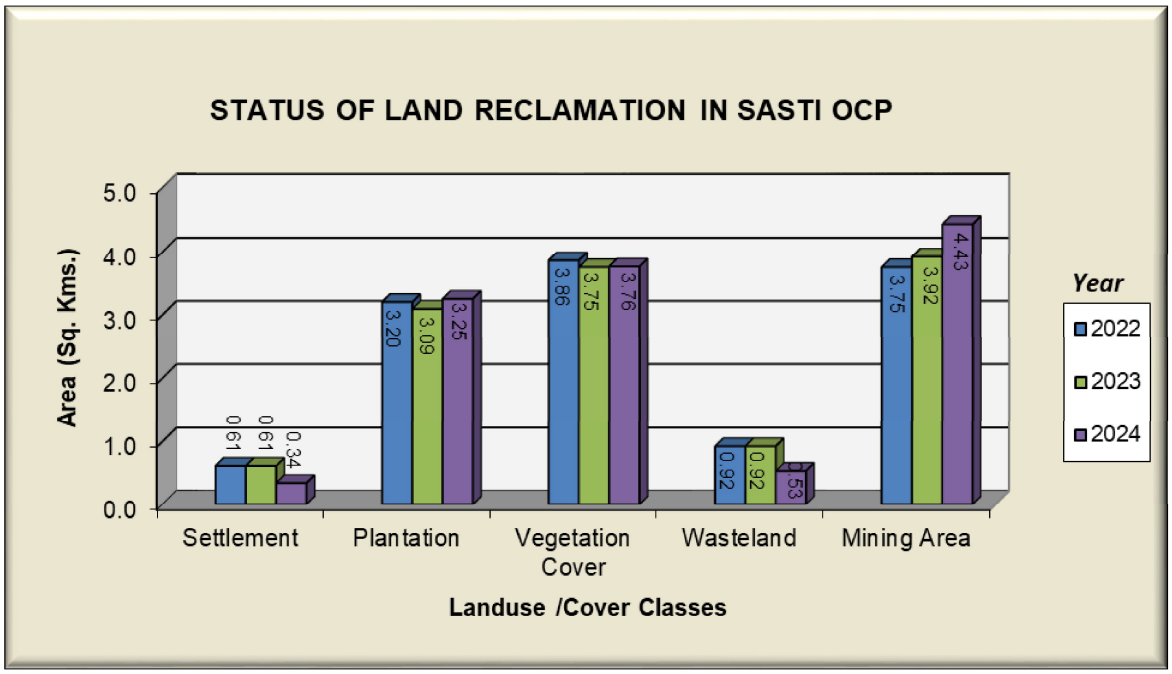


Figure 4

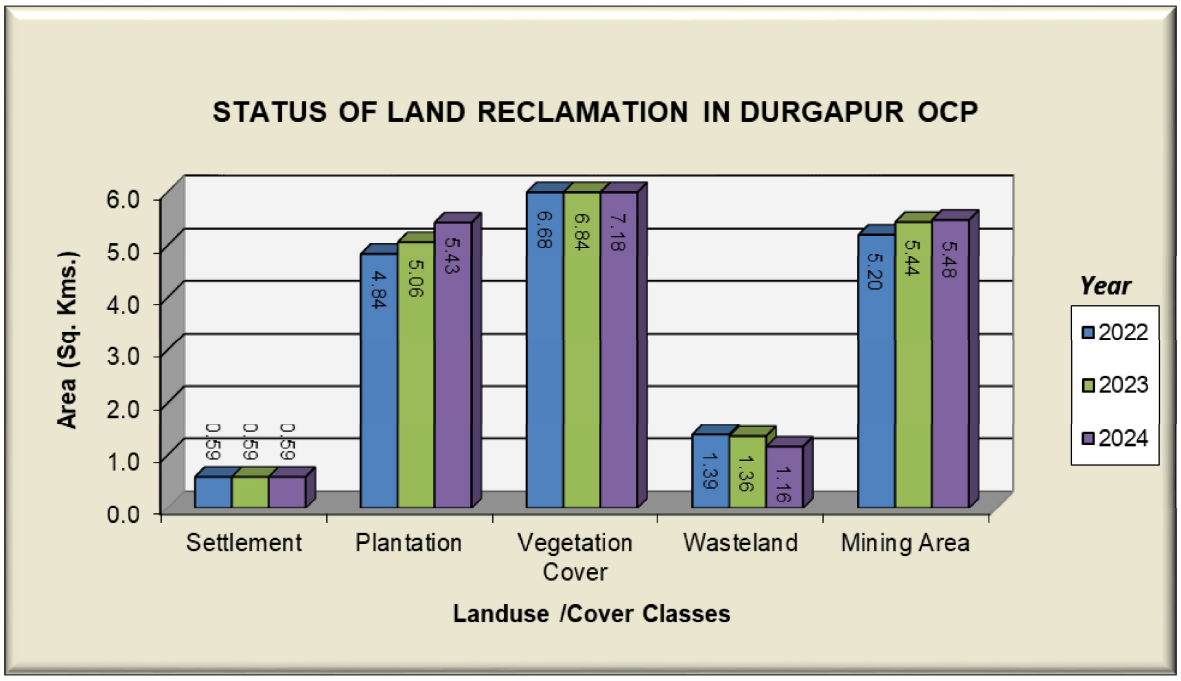


Figure 5

Photograph-1: Plantation on Internal OB/Backfill (Sasti OCP)

Photograph-2: Avenue Plantation (Durgapur OCP)

Maharashtra Pollution Control Board

महाराष्ट्र प्रदूषण नियंत्रण मंडळ

Application for Consent/ Authorisation

Sir,
I/We hereby apply for*

1. Consent to Establish/Operate/Renewal of consent under section 25 and 26 of the Water (Prevention & Control of Pollution) Act, 1974 as amended.

2. Consent to Establish/Operate/Renewal of consent under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981, as amended.

3. Authorization/renewal of authorization under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 in connection with my/our/existing/proposed/altered/ additional manufacturing/processing activity from the premises as per the details given below.

Consent Information

UAN No:
MPCB-CONSENT-0000182369

Application submitted on:
23-09-2023

Industry Information

Consent To:
Operate

IIN No.:

Submit to:
SRO - Chandrapur

Type of institution:
Industry

Industry Type:
R35 Mining and ore beneficiation

Category:
Red

Scale:
L.S.I

Revised Industry Categorization as per CPCB Guidelines 2025

New Industry Type:

Sector:

New Category:

Location of industry/activity/etc:
Local Body

Name of Local Body:
wcl sasti village

EC Reqd.
Yes

EC Obtained
EC Obtained

EC Ref. No.
J-11015/435/2006.IA.II(M)

Date of issue of EC
Sep 13, 2023

Parivesh Proposal Number
J-11015/435/2006.IA.II(M)

MoEFCC/SEIAA File Number
J-11015/435/2006.IA.II(M)

Whether construction-buildup area is more than 20,000 sq.mtr.(Existing Expansion Unit)
No

General Information

1. Name, designation, office address with Telephone/Fax numbers, e-mail of the Applicant Occupier/Industry/Institution / Local Body.

Name
Manish Podey

Address
Sasti OC mine, WCL Ballarpur Area PO: Sasti

Designation

Taluka

SUB AREA MANAGER

Rajura

Area
Chandrapur

District
Chandrapur

Telephone
8275968410

Fax
07173230076

Email
envsocm@gmail.com

Pan Number
AAACW1578L

---

2. (a) Name and location of the industrial unit/premises for which the application is made (Give revenue Survey Number/Plot number name of Taluka and District, also telephone and fax number)

Industry name
EXPANSION OF SASTI OPENCAST MINE PROJECT

Location of Unit
SASTI VILLAGE

Survey number/Plot Number
TOPOSHEET NO.56 SURVEY OF INDIA

Taluka
BALLARPUR CHANDRAPUR

District
Chandrapur

(b) Details of the planning permission obtained from the local body/Town and Country Planning authority/Metropolitan Development authority/ designated Authority.

Planning permission
CMPDIL RI-IV

Planning Authority
CMPDIL RI-IV

Name of the local body under whose jurisdiction the unit is located and Name of the licence issuing authority

Name of Local Body
GRAM PANCHAYAT SASTI

Name of the licence issuing authority
CENTRAL GOVERNMENT PSU

Sanction plan/ Approved layout Plan/Commencement Certificate

---

3. Names,addresses with Telephone and Fax Number of Managing Director / Managing Partner and officer responsible for matters connected with pollution control and/or Hazardous waste disposal.

Name of Managing Director
SHRI MANOJ KUMAR

Telephone number
07122511383

Fax number
07122511383

Officer responsible for day to day business
SUB AREA MANAGER

4. (a.) Are you registered Industrial unit ?

Yes

Registration number
U10100MH1975GOI018626

Date of registration
Oct 29, 1975

---

5. Gross capital investment of the unit without depreciation till the date of application (Cost of building, land, plant and machinery). (To be supported by an affidavit/undertaking on Rs.20/- stamp paper, annual report or certificate from a Chartered Accountant for proposed unit(s), give estimated figure)

Gross capital (in Lakh)	**** Verified***	**** Terms***	**** Consent Fee***
37159.29	CA Certificate	1	3486372.00

---

6. If the site is located near sea-shore/river bank/other water bodies/Highway, Indicate the crow fly distance and the name of the water body, if any.

Distance From	***Distance(Km)***	**** Name***
SH/NH	0.00	--NA--
River	2.50	Wardha River
Human Habitation	0.00	--NA--

Religious Place	0.00	--NA--
Historical Place	0.00	--NA--
Creek/Sea	0.00	--NA--

6b. Enter Latitude and Longitude details of site

Latitude	***Longitude***
19.82	79.338

7. Does the location satisfy the Requirements Under relevant Central/State Govt. Notification such as Coastal Regulation Zone. Notification on Ecologically Fragile Area, Industrial Location policy, etc. If so, give details.

Location	***Approved Industry Area***	***Sensitive Area***	***If Yes, Name Of Area***	***Industry Location with Reference to CRZ***
NA	No	No	NA	

8. If the site is situated in notified industrial estate,

		Details
(a) Whether effluent collection, treatment and disposal system has been provided by the authority.	Yes	ETP OF 100 KLD PROVIDED
(b) Will the applicant utilize the system, if provided.	Yes	UNDER OPERATION
(c) If not provided, details of proposed arrangement.	NA	

9.

(a) Total plot area (in squear meter)	***(b) Built up area and (in squear meter)***	***(c) Area available for the use of treated sewage/ trade effluent for gardening/irrigation. (in squear meter)***
11204800	1490045	1094.5

10. Month and year of commissioning of the Unit.

1985-11-11

11. Number of workers and office staff

Workers	***staff***	***Hrs. of shift***	***Weekly off***
770	36	8	WEDNESDAY

12.

(a) Do you have a residential colony Within the premises in respect of Which the present application is Made ?	No	NA

(b) If yes, please state population staying

Number of person staying	***Water consumption***	***Sewage generation***	***Whether is STP provided?***
0	0	0	No

(c) Indicate its location and distance with reference to plant site.

Number of person staying	***Water consumption***
NA	0

13. List of products and by-products Manufactured in tonnes/month, Kl/month or numbers/month with their types i.e.Dyes, drugs etc. (Give figures corresponding to maximum installed production capacity

Products Name and Quantity

Product Name	UOM	Product Name	Existing	Consented	Proposed Revision	Total	Remarks
Mining	MT/A	COAL	2.5	2.5	0	2.5	CTO FOR 2.5 MTPA

Products Name and Quantity

Product Name	UOM	Quantity	Remarks
OVERBURDEN	m3/day	17630	NA

14. List of raw materials and process chemicals with annual consumption corresponding to above stated production figures, in tonnes/month or kl/month or numbers/month.

Name of Raw Material	UOM	Quantity	Hazardous Waste	Hazardous Chemicals	Remarks
NA	--NA--	0	No	No	NA

15. Description of process of manufacture for each of the products showing input, output, quality and quantity of solid, liquid and gaseous wastes, if any from each unit process.

ATTACHED

Part B : Waste Water aspects

16. Water consumption for different uses (m3/day)

Purpose	Consumption	Effluent Generation	Treatment	Remarks	Disposal	Remarks
Domestic Pourpose	40	10	Septic Tank & Soak Pit	na	--NA--	NA
Water gets Polluted & Pollutants are Biodegradable	0	0	--NA--	Na	Recycle	NA
Water gets Polluted,Pollutants are not Biodegradable & Toxic	0	0	--NA--	na	--NA--	NA
Industrial Cooling,spraying in mine pits or boiler feed	593	0	OTHERS	NA	--NA--	NA
Others	6456					

17. Source of water supply, Name of authority granting permission if applicable and quantity permitted.

Source of water supply	Specify Other	Name of authority granting permission	Qauntity permitted
Other	MINEWATER	CGWA	7062

18. Quantity of waste water (effluent) generated (m3/day)

Domastic	Boiler Blowdown	Industrial	Cooling water blowdown
10	0	0	0
Process	**DM Plants/Softening**	**Washing**	**Tail race discharge from**
6456	0	0	0

19. Water budget calculations accounting for difference between water consumption and effluent generated.

ATTACHED

20. Present treatment of sewage/canteen effluent (Give sizes/capacities of treatment units).

Capacity of STP (m3/day)

0

Treatment unit	***Size (mxm)***	***Retention time (hr)***
0	0	0

21. Present treatment of trade effluent (Give sizes/capacities of treatment units) (A schematic diagram of the treatment scheme with inlet/outlet characteristics of each unit operation/process is to be provided. Include details of residue Management system (ETP sludges)

Capacity of ETP (m3/day)

150

Treatment unit	***Size (mxm)***	***Retention time (hr)***
WASHING RAMP	0	0.5
DRAIN	0	0.16
SECONDARY DRAIN	0	0.25
SETTLING TANK	0	2
SKIMMER TANK	0	0.25
COLLECTION TANK	0	2
CLARIFIER	0	2
CLEAN WATER TANK	0	2

22.

(i) Are sewage and trade effluents mixed together?	No
If yes, state at which stage-Whether before, intermittently or after treatment.	NA

23. Capacity of treated effluent sump, Guard Pond if any.

Capacity of treated effluent sump (m3)	50	
Effluent sump/Guard pond details	Yes	50
If yes, state at which stage-Whether before, intermittently or after treatment.	No	

24. Mode of disposal of treated effluent With respective quantity, m3/day

(i) into stream/river (name of river)	MINE WATER AFTER TREATMNENT AT SEDIMENTATION POND JOINS LOCAL NALLAH	***(ii) into creek/estuary (name of Creek/estuary)***	NA
(iii) into sea	NA	***(iv) into drain/sewer (owner of sewer)***	NA
(v) On land for irrigation on owned land/ase land. Specify cropped area.	NA	***(vi) Connected to CETP***	NA

(vii) Quantity of treated effluent reused/ recycled, m3/day Provide a location map of disposal arrangement indicating the outler(s) for sampling. Treated effluent reused / recycled (m3/day)	150	***Mode of disposal types***
Mode of disposal types other (if any)		

25. (a) Quality of untreated/treated effluents (Specify pH and concentration of SS, BOD,COD and specific pollutants relevant to the industry. TDS to be reported for disposal on land or into stream/river.

Untreated Effluent

pH	0
SS (mg/l)	0
BOD (mg/l)	0
COD (mg/l)	0
TDS (mg/l)	0

Specific pollutant if any	***Name***	***Value***
1	NA	0

Treated Effluent

pH	7.36
SS (mg/l)	68
BOD (mg/l)	-
COD (mg/l)	76
TDS (mg/l)	-

Specific pollutant if any	***Name***	***Value***
1	NA	0

(b) Enclose a copy of the latest report of analysis from the laboratory approved by State Board/ Committee/Central Board/Central Government in the Ministry of Environment expected characteristics of the untreated/treated effluent

ENCLOSED

26. Fuel consumption

Fuel Type	***UOM***	***Fuel Consumption TPD/LKD***	***Calorific value***
--NA--	--NA--	0	0
Ash content	***Sulphur content***	***Quantity***	***Other (specify)***
0	0	1	0

27. (a) Details of stack (process & fuel stacks: D. G.)

(a) Stack number(s)	***(b) Stack attached to***	***(c) Capacity***	***(d) Fuel Type***
NA	NA	NA	NA
(e) Fuel quantiy (Kg/hr.)	***(f) Material of construction***	***(g) Shape (round/rectangular)***	***(h) Height, m (above ground level)***
0	0	0	0
(i) Diameter/Size, in meters	***(j) Gas quantity, Nm3/hr.***	***(k) Gas temperature °C***	***(l) Exit gas velocity, m/sec.***
0	0	0	0

(m) Control equipment preceding the stack	*(n) Nature of pollutants likely to present in stack gases such as CI2, Nox, Sox TPM etc.*	*(o) Emissions control system provided*	*(p) In case of D.G. Set power generation capacity in KVA*
NA	NA	NA	NA

27. (B) Whether any release of odoriferous compounds such as Mercaptans, Phorate etc. Are coming out from any storages or process house.

NA

28. Do you have adequate facility for collection of samples of emissions in the form of port holes, platform, ladder\etc. As per Central Board Publication “Emission regulations Part-III” (December, 1985)

Poart hole	No	***Details***	NA
Platform	No	***Details***	NA
Ladder	No	***Details***	NA

29. Quality of treated flue gas emissions and process emissions. Quantity of treated flue gas emissions and process emissions.

Sr. No.	*Stack attached to*	*Parameter*	*Concentration mg/Nm3*	*flow (Nm3/hr)*
1	NA	0	0	0

(Specify concentration of criteria pollutants and industry/process-specific pollutants stack-wise. Enclose a copy of the latest report of analysis from the laboratory approved by State Board/Central Board/ Central Government in the Ministry of Environment & Forests. For proposed unit furnish expected characteristics of the emissions..

NA

Part - D: Hazardous Waste aspect

30 Information about Hazardous Waste Management as defined in Hazardous Waste (Management & Handling) Rules, 1989 as amended in Jan.,2000. Type/Category of Waste as per

Waste (Annually) Schedule I

Cat No	*Type*	*Qty*	*UOM*
5.1	5.1 Used or spent oil		
Max	***Method of collection***	***Method of reception***	***Method of storage***
	MANUAL	MANUAL	BARREL
Method of transport	***Method of treatment***	***Method of disposal***	
DONE BY APPROVED RECYCLER	DONE BY APPROVED RECYCLER	DONE BY APPROVED RECYCLER	

Cat No	*Type*	*Qty*	*UOM*
35.3	35.3 Chemical sludge from waste water treatment	50	Ton/Y
Max	***Method of collection***	***Method of reception***	***Method of storage***
	MANUAL	MANUAL	TANK
Method of transport	***Method of treatment***	***Method of disposal***	
CHWTSDF	CHWTSDF	CHWTSDF	

Waste (Annually) Schedule II

31. Details about use of hazardous waste

Name of hazardous waste/Spent chemical	Quantity used/month	Party from whom purchased	Party to whom sold
NA	0	NA	NA

32.

a. Details about technical capability and equipments available with the applicant to handle the Hazardous Waste

NA

b. Characteristics of hazardous waste(s) Specify concentration of relevant pollutants. Enclose a copy of the latest report of analysis from the laboratory approved by State Board/Central Board/Central Govt. in the ministry of Environment & Forests. For proposed units furnish expected characteristics

NA

33.

Copy of format of manifest/record Keeping practiced by the applicant.

NA

34.

Details of self-monitoring (source and environment system)

NA

35.

Are you using any imported hazardous waste. If yes, give details.

NA

36.

Copy of actual user Registration/certificate obtained from State Pollution Control Board/Ministry of Environment & Forests, Government of India, for use of hazardous waste.

NA

37.

Present treatment of hazardous waste, if any (give type and capacity of treatment units)

NA

38. Quantity of hazardous waste disposal

(i) Within factory

0

(ii) Outside the factory (specify location and enclose copies of agreement.)

0

(iii) Through sale (enclosed documentary proof and copies of agreement.)

0

(iv) Outside state/Union Territory, if yes particulars of (1 & 3) above.

0

(v) Other (Specify)

0

Part - E: Additional information

39.

a. Do you have any proposals to upgrade the present system for treatment and disposal of effluent/emissions and/or hazardous waste.

YES TROLLEY MOUNTED FOGGERS(2 NOS), DUST BARRIER, PLANTATION, SPRINKLERS

b. If yes, give the details with time- schedule for the implementation and approximate expenditure to be incurred on it.

BY DEC 2023

40.

Capital and recurring (O & M) expenditure on various aspect of environment protection such as effluent, emission, hazardous waste, solid waste, tree- plantation, monitoring, data acquisition etc. (give figures separately for items implemented/to be implemented).

CAPITAL EXPENDITURE F 671.3 LAKHS AND REVENUE EXPENDITURE OF 470 LAKHS

41.

To which of the pollution control equipment, separate meters for recording consumption of electric energy are installed ?

NONE

42.

Which of the pollution control items are connected to D.G. Set (captive power source) to ensure their running in the event of normal power failure

NA

---

43. Nature, quantity and method of disposal of non- hazardous solid waste generated separately from the process of manufacture and waste treatment. (Give details of area/capacity available in applicant's land)

Type	*Quantity*	*UOM*	*Treatment*	*Disposal*	*Other Details*
0	0	--NA--	0	0	0

---

44. Hazardous Chemicals – Give details of Chemicals and quantities handled and Stored.

(i) Is the unit a Majot Accident Hazard unit as per Mfg.Storage Import Hazardous Chemicals Rules ?

NA

(ii) Is the unit an isolated storage as defined under the MSIHC Rules ?

NA

(iii) Indicate status of compliance of Rules 5,7,10,11,12,13 and 18 of the MSIHC Rules.

NA

(iv) Has approval of site been obtained from the concerned authority?

NA

(v) Has the unit prepared an off-site Emergency Plan? Is it updated ?

NA

(vi) Has information on imports of Chemicals been provided to the concerned authority?

NA

(vii) Does the unit possess a policy under the PLI Act?

NA

---

45. Brief details of tree plantation/green belt development within applicant's premises (in hectors)

Open Space Availability	*Plantation Done On*	*Number of Trees Planted*
45165000 Square meter	16915000 Square meter(37 %)	520000

46.

Information of schemes for waste Minimization, resource recovery and recycling - implemented and to be implemented, separately.

WASTEWATER GENERATED DUE TO VEHICLE WASHING IS TREATED AT ETP AND AGAIN REUSED.

47.

(a) The applicant shall indicate whether Industry comes under Public Hearing, if so, the relevant documents such as EIA, EMP, Risk Analysis etc. shall be submitted, if so, the relevant documents enclosed shall be indicated accordingly.

PUBLIC HEARING CONDUCTED ON 16/03/2023

(b) Any other additional information that the applicants desires to give

NA

(c) Whether Environmental Statement submitted ? If submitted, give date of submission.

ENVIRONMENT STATEMENT SUBMITTED ON 25.09.2022

48.

I/We further declare that the information furnished above is correct to the best of my/our knowledge.

49.

I/We hereby submit that in case of any change from what is stated in this application in respect of raw materials, products, process of manufacture and treatment and/or disposal of effluent, emission, hazardous wastes etc. In quality and quantity; a fresh application for Consent/Authorization shall be made and until the grant of fresh Consent/Authorization no change shall be made.

50.

I/We undertake to furnish any other information within one month of its being called by the Board

Yours faithfully

Signature : SUB AREA MANAGER
Name : SUB AREA MANAGER
Designation : SUB AREA MANAGER

Additional Information

Air Pollution

Sr No.	*Air Pollution Source*	*Pollutants*	*APCS Provided*	*Remark*
1	Coal Stock Yard, Coal transportation road, Crusher	PM10 PM2.5	RAINGUNS ARE PROVIDED AND WATER PSRINKLING IS REGULARLY ENSURED	NA

Separate EM Provided	No	***Other Emission Sources***	NA
Measures Proposed	NA	***Foul Smell Coming Out***	No
Air Sampling Facility Details	Every fortnight monitoring by CMPDIL RI-IV Nagpur		

D.G. Set Details

Description	*Capacity(KVA)*	*Remarks*
NA	0	NA

Hazardous Waste Generation

Hazardous Waste	*Quantity*	*UOM*	*Treatment*	*Disposal*	*Other Details*
5.1 Used or spent oil	40	KL/A	RECYCLER	RECYCLER	-

5.2 Wastes or residues containing oil	1	Ton/Y	CHWTSDF BUTIBORI	CHWSTDF BUTIBORI	-
35.3 Chemical sludge from waste water treatment	8	Ton/Y	CHWTSDF BUTIBORI	CHWSTDF BUTIBORI	NA

CHWTSDF Details

Member of CHWTSDF	*CHWTSDF Name*	*Remarks*

Cess Details

Cess Applicable	*Cess Paid*	*If Yes, UpTo*
No	Yes	Aug 31 2015 12:00:00:000AM

Legal Actions

Legal Action Taken	*Legal Record Of Company*	*Legal Action Details*	*Remarks*
No			

Bank Guarantee Applicable: No

Annexure

Environment Clearance

Date	*Project Details*	*Capital Investment(Crs.)*	*Total Plot area(sq. mtrs.)*	*Total Built up area(sq. mtrs.)*	*Amendment/Extension*
Jan 1, 1970		0	0	0	

Environment clearance/Consent Before 2008

Date	*Capital Investment(Crs.)*	*Amendment/Extension/Transfer*
Jan 1, 1970	0.00	

Products	*Quantity(MT/A)*
	0

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

ENVIRONMENTAL MONITORING REPORT

SASTI OC

BALLARPUR AREA

WESTERN COALFIELDS LTD.

JOB NO. 4094423068

JANUARY 2025

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	TC-7102

TEST REPORT NO.	RIN/TR/JAN-25/48		DATE OF ISSUE	25-02-2025
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:			16-01-25 TO 15-02-25

SAM OFFICE-SASTI OC		BSOA1					
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	
03-01-2025	04-01-2025	264	154	52	21	12	clear sky / light breeze
17-01-2025	18-01-2025	286	167	60	20	14	clear sky / light breeze
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

AREA STORE		BSOA2					
`		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	
03-01-2025	04-01-2025	245	132	44	15	BDL	clear sky / light breeze
17-01-2025	18-01-2025	260	143	53	19	11	clear sky / light breeze
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

GOURI COLONY FILTER PLANT		BSOA3				
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	
06-01-2025	07-01-2025	76	32	13	BDL	clear sky / light breeze
07-01-2025	08-01-2025	67	36	12	BDL	clear sky / light breeze
13-01-2025	14-01-2025	79	40	12	BDL	clear sky / light breeze
14-01-2025	15-01-2025	70	28	13	BDL	clear sky / light breeze
20-01-2025	21-01-2025	83	30	13	BDL	clear sky / light breeze
21-01-2025	22-01-2025	84	32	10	BDL	clear sky / light breeze
27-01-2025	28-01-2025	88	34	12	BDL	clear sky / light breeze
28-01-2025	29-01-2025	70	30	11	BDL	clear sky / light breeze
NAAQS, 2009		**100**	**60**	**80**	**80**	

SASTI VILLAGE		BSUA4				
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	
06-01-2025	07-01-2025	65	34	10	BDL	clear sky / light breeze
07-01-2025	08-01-2025	72	30	12	BDL	clear sky / light breeze
13-01-2025	14-01-2025	68	42	12	BDL	clear sky / light breeze
14-01-2025	15-01-2025	66	31	13	BDL	clear sky / light breeze
20-01-2025	21-01-2025	70	40	10	BDL	clear sky / light breeze
21-01-2025	22-01-2025	63	22	11	BDL	clear sky / light breeze
27-01-2025	28-01-2025	66	32	14	BDL	clear sky / light breeze
28-01-2025	29-01-2025	78	35	15	BDL	clear sky / light breeze
NAAQS, 2009		**100**	**60**	**80**	**80**	

Analysed by

Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	TC-7102

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 : 16-01-25 TO 15-02-25

MINE WATER DISCHARGE:	BSOW1			
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
03-01-2025	7.74	20	40	BDL
17-01-2025	7.65	28	44	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

ETP DISCHARGE:	BSOW2			
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
03-01-2025	7.77	24	36	BDL
17-01-2025	7.61	22	32	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

STP(DOMESTIC EFFLUENT)TREATED:	BSOW3	
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS	
	TSS (in mg/l)	BOD(in mg/l)
DETECTION LIMIT	10	2
03-01-2025	28	10.2
17-01-2025	32	10.6
GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENT POLLUTANTS GSR 801E EPA 1993	100	30

Analysed by

Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	TC-7102

NOISE LEVEL MONITORING DATA

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

CHP:		BSON1	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
JAN'25	11-01-2025	68.7	66.9
JAN'25	25-01-2025	68.9	66.7
NOISE POLLUTION (REGULATION AND CONTROL) RULES,2000		**75**	**70**

GOURI COLONY:		BSON2	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
JAN'25	11-01-2025	44.1	42.3
JAN'25	25-01-2025	44.3	42.7
NOISE POLLUTION (REGULATION AND CONTROL) RULES,2000		**55**	**45**

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ENVIRONMENTAL MONITORING REPORT

SASTI OC

BALLARPUR AREA

WESTERN COALFIELDS LTD.

JOB NO. 4094423068

FEBRUARY 2025

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	TC-7102

TEST REPORT NO.		RIN/TR/FEB-25/48		DATE OF ISSUE	25-03-2025
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:			16-02-25 TO 15-03-25

SAM OFFICE-SASTI OC		BSOA1					
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	
02-02-2025	03-02-2025	270	165	50	20	12	clear sky / light breeze
16-02-2025	17-02-2025	264	168	58	21	11	clear sky / light breeze
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

AREA STORE		BSOA2					
`		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	
02-02-2025	03-02-2025	288	162	48	19	12	clear sky / light breeze
16-02-2025	17-02-2025	275	156	50	14	BDL	clear sky / light breeze
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

GOURI COLONY FILTER PLANT		BSOA3				
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	
05-02-2025	06-02-2025	77	39	12	BDL	clear sky / light breeze
06-02-2025	07-02-2025	82	33	11	BDL	clear sky / light breeze
12-02-2025	13-02-2025	78	38	10	BDL	clear sky / light breeze
13-02-2025	14-02-2025	89	33	12	BDL	clear sky / light breeze
19-02-2025	20-02-2025	91	44	11	BDL	clear sky / light breeze
20-02-2025	21-02-2025	76	38	13	BDL	clear sky / light breeze
26-02-2025	27-02-2025	70	40	12	BDL	clear sky / light breeze
27-02-2025	28-02-2025	85	36	10	BDL	clear sky / light breeze
NAAQS, 2009		**100**	**60**	**80**	**80**	

SASTI VILLAGE		BSUA4				
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	
05-02-2025	06-02-2025	74	33	11	BDL	clear sky / light breeze
06-02-2025	07-02-2025	80	42	10	BDL	clear sky / light breeze
12-02-2025	13-02-2025	76	39	11	BDL	clear sky / light breeze
13-02-2025	14-02-2025	70	35	12	BDL	clear sky / light breeze
19-02-2025	20-02-2025	73	42	12	BDL	clear sky / light breeze
20-02-2025	21-02-2025	67	26	14	BDL	clear sky / light breeze
26-02-2025	27-02-2025	69	33	12	BDL	clear sky / light breeze
27-02-2025	28-02-2025	80	40	12	BDL	clear sky / light breeze
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 : 16-02-25 TO 15-03-25

MINE WATER DISCHARGE:	BSOW1			
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
02-02-2025	7.76	28	36	BDL
16-02-2025	7.65	24	40	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

ETP DISCHARGE:	BSOW2			
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
02-02-2025	7.45	20	44	BDL
16-02-2025	7.68	22	36	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

STP(DOMESTIC EFFLUENT)TREATED:	BSOW3	
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS	
	TSS (in mg/l)	BOD(in mg/l)
DETECTION LIMIT	10	2
02-02-2025	24	10.4
16-02-2025	32	12.6
GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENT POLLUTANTS GSR 801E EPA 1993	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

CHP:		BSON1	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
FEB'25	10-02-2025	67.8	66.6
FEB'25	25-02-2025	69.2	66.4
NOISE POLLUTION (REGULATION AND CONTROL) RULES,2000		**75**	**70**

GOURI COLONY:		BSON2	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
FEB'25	10-02-2025	48.6	43.5
FEB'25	25-02-2025	43.8	42.6
NOISE POLLUTION (REGULATION AND CONTROL) RULES,2000		**55**	**45**

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ENVIRONMENTAL MONITORING REPORT

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MARCH 2025

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Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

TEST REPORT NO.	RIN/TR/MAR-25/48		DATE OF ISSUE	15-04-2025
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:			16-03-25 TO 15-04-25

SAM OFFICE-SASTI OC BSOA1

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	
01-03-2025	02-03-2025	255	168	48	16	10	clear sky / light breeze
16-03-2025	17-03-2025	246	152	52	18	12	clear sky / light breeze
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

AREA STORE BSOA2

		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	
01-03-2025	02-03-2025	285	174	52	12	BDL	clear sky / light breeze
16-03-2025	17-03-2025	296	180	60	16	11	clear sky / light breeze
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

GOURI COLONY FILTER PLANT BSOA3

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	
04-03-2025	05-03-2025	87	30	10	BDL	clear sky / light breeze
05-03-2025	06-03-2025	95	47	12	BDL	clear sky / light breeze
11-03-2025	12-03-2025	88	40	11	BDL	clear sky / light breeze
12-03-2025	13-03-2025	75	30	9	BDL	clear sky / light breeze
20-03-2025	21-03-2025	90	46	10	BDL	clear sky / light breeze
21-03-2025	22-03-2025	84	42	8	BDL	clear sky / light breeze
27-03-2025	28-03-2025	77	36	10	BDL	clear sky / light breeze
28-03-2025	29-03-2025	80	40	11	BDL	clear sky / light breeze
29-03-2025	30-03-2025	76	32	10	BDL	clear sky / light breeze
NAAQS, 2009		**100**	**60**	**80**	**80**	

SASTI VILLAGE BSUA4

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	
02-03-2025	03-03-2025	70	39	10	BDL	clear sky / light breeze
03-03-2025	04-03-2025	74	36	9	BDL	clear sky / light breeze
09-03-2025	10-03-2025	66	31	12	BDL	clear sky / light breeze
10-03-2025	11-03-2025	79	40	8	BDL	clear sky / light breeze
18-03-2025	19-03-2025	69	33	10	BDL	clear sky / light breeze
19-03-2025	20-03-2025	77	35	9	BDL	clear sky / light breeze
24-03-2025	25-03-2025	84	41	11	BDL	clear sky / light breeze
25-03-2025	26-03-2025	73	28	11	BDL	clear sky / light breeze
28-03-2025	29-03-2025	65	30	12	BDL	clear sky / light breeze
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 document		
SAMPLE DESCRIPTION	Air sample(Fugitive)		
SAMPLING METHOD : LSOP 4		PERIOD OF PERFORMANCE OF LAB ACTIVITIES:	16-03-25 TO 15-04-25

WEIGH BRIDGE		BSOF1		
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	
25.3.2025	26.3.2025	487	382	Cloudy Sky / Light Breeze
MAIN CHP		**BSOF2**		
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	
25.3.2025	26.3.2025	598	410	Cloudy Sky / Light Breeze

Analysed by

Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	TC-7102

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 : 16-03-25 TO 15-04-25

MINE WATER DISCHARGE:	BSOW1			
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
02-03-2025	7.82	28	52	BDL
17-03-2025	7.8	24	44	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

ETP DISCHARGE:	BSOW2			
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
02-03-2025	7.9	22	36	BDL
17-03-2025	7.85	26	44	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

STP(DOMESTIC EFFLUENT)TREATED:	BSOW3	
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS	
	TSS (in mg/l)	BOD(in mg/l)
DETECTION LIMIT	10	2
01-03-2025	28	10.8
16-03-2025	24	10.6
GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENT POLLUTANTS GSR 801E EPA 1993	100	30

Analysed by

Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

NOISE LEVEL MONITORING DATA

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

CHP:		BSON1	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
MAR'25	12-03-2025	68.9	67.3
MAR'25	24-03-2025	68.1	66.2
NOISE POLLUTION (REGULATION AND CONTROL) RULES,2000		**75**	**70**

GOURI COLONY:		BSON2	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
MAR'25	12-03-2025	43.4	41.2
MAR'25	24-03-2025	44.7	42.6
NOISE POLLUTION (REGULATION AND CONTROL) RULES,2000		**55**	**45**

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APRIL 2025

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Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	TC-7102

TEST REPORT NO.	RIN/TR/APRIL-25/48		DATE OF ISSUE	25-05-2025
NAME OF CUSTOMER	GM(ENV.), WCL(HQ), NAGPUR			
TEST REQUIRED	SPM: IS 5182 (Part-4), PM-10: IS-5182 (Part 23), PM2.5: IS 5182 (Part 24), NO2: IS 5182 (Part-06), SO2:IS 5182 (Part-2)			
SAMPLE DESCRIPTION	AIR SAMPLE		SAMPLING PLAN :	LQR 47
SAMPLING METHOD : LSOP 4	PERIOD OF PERFORMANCE OF LAB ACTIVITIES:			16-04-25 TO 15-05-25

SAM OFFICE-SASTI OC BSOA1

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	
06-04-2025	07-04-2025	246	164	50	15	10	clear sky / light breeze
20-04-2025	21-04-2025	298	192	60	24	12	clear sky / light breeze
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

AREA STORE BSOA2

		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	
06-04-2025	07-04-2025	302	187	48	15	10	clear sky / light breeze
20-04-2025	21-04-2025	275	168	52	19	11	clear sky / light breeze
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

GOURI COLONY FILTER PLANT BSOA3

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	
04-04-2025	05-04-2025	94	30	8	BDL	clear sky / light breeze
05-04-2025	06-04-2025	84	34	12	BDL	clear sky / light breeze
11-04-2025	12-04-2025	78	37	10	BDL	clear sky / light breeze
12-04-2025	13-04-2025	92	42	7	BDL	clear sky / light breeze
18-04-2025	19-04-2025	80	33	9	BDL	clear sky / light breeze
19-04-2025	20-04-2025	70	36	8	BDL	clear sky / light breeze
25-04-2025	26-04-2025	84	39	10	BDL	clear sky / light breeze
26-04-2025	27-04-2025	78	40	9	BDL	clear sky / light breeze
NAAQS, 2009		**100**	**60**	**80**	**80**	

SASTI VILLAGE BSUA4

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	
04-04-2025	05-04-2025	65	26	9	BDL	clear sky / light breeze
05-04-2025	06-04-2025	75	30	10	BDL	clear sky / light breeze
11-04-2025	12-04-2025	62	33	10	BDL	clear sky / light breeze
12-04-2025	13-04-2025	88	30	11	BDL	clear sky / light breeze
18-04-2025	19-04-2025	60	22	8	BDL	clear sky / light breeze
19-04-2025	20-04-2025	70	33	9	BDL	clear sky / light breeze
25-04-2025	26-04-2025	78	36	10	BDL	clear sky / light breeze
26-04-2025	27-04-2025	70	34	7	BDL	clear sky / light breeze
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), PM-10: IS-5182 (Part 23), PM2.5: IS 5182 (Part 24)		
SAMPLE DESCRIPTION	Air sample(Fugitive)		
SAMPLING METHOD : LSOP 4		PERIOD OF PERFORMANCE OF LAB ACTIVITIES:	16-04-25 TO 15-05-25

WEIGH BRIDGE	BSOF1			
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	
25-04-2025	26-04-2025	496	398	Cloudy Sky / Light Breeze
MAIN CHP	**BSOF2**			
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	
25-04-2025	26-04-2025	542	425	Cloudy Sky / Light Breeze

Analysed by

Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

SAMPLE DESCRIPTION	Water sample	
Test Required	pH: IS 3025 -Part 11, TSS: IS 3025-Part 17, COD: APHA (24th Edition) 5220 C ,O&G: IS 3025-Part 39 & BOD: IS 3025 (Part 44)	
SAMPLING METHOD	LSOP 5	PERIOD OF PERFORMANCE OF LAB ACTIVITIES : 16-04-25 TO 15-05-25

MINE WATER DISCHARGE:	BSOW1			
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
06-04-2025	7.58	20	32	BDL
27-04-2025	7.68	32	60	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

ETP DISCHARGE:	BSOW2			
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
06-04-2025	7.58	20	32	BDL
27-04-2025	7.94	22	40	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

STP(DOMESTIC EFFLUENT)TREATED:	BSOW3	
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS	
	TSS (in mg/l)	BOD(in mg/l)
DETECTION LIMIT	10	2
06-04-2025	24	12.2
27-04-2025	26	12.8
GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENT POLLUTANTS GSR 801E EPA 1993	100	30

Analysed by

Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	TC-7102

NOISE LEVEL MONITORING DATA

SAMPLE DESCRIPTION	NOISE SAMPLE
Test Required	CPCB PROTOCOL FOR AMBIENT NOISE MEASUREMENT
SAMPLING METHOD	LSOP 6

CHP:		BSON1	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
APRIL'25	11-04-2025	70.2	68.9
APRIL'25	25-04-2025	66.8	61.4
NOISE POLLUTION (REGULATION AND CONTROL) RULES,2000		**75**	**70**

GOURI COLONY:		BSON2	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
APRIL'25	11-04-2025	43.2	41.1
APRIL'25	25-04-2025	46.5	41.7
NOISE POLLUTION (REGULATION AND CONTROL) RULES,2000		**55**	**45**

Yogesh Pidurkar
Reviewed by

Amol Kamble
Authoriesed by

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ENVIRONMENTAL MONITORING REPORT

SASTI OC

BALLARPUR AREA

WESTERN COALFIELDS LTD.

JOB NO. 4094423068

MAY 2025

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	TC-7102

TEST REPORT NO.	RIN/TR/MAY-25/48		DATE OF ISSUE	25-06-2025
NAME OF CUSTOMER	GM(ENV.), WCL(HQ), NAGPUR			
TEST REQUIRED	SPM: IS 5182 (Part-4), PM-10: IS-5182 (Part 23), PM2.5: IS 5182 (Part 24), NO2: IS 5182 (Part-06), SO2:IS 5182 (Part-2)			
SAMPLE DESCRIPTION	AIR SAMPLE		SAMPLING PLAN :	LQR 47
SAMPLING METHOD : LSOP 4	PERIOD OF PERFORMANCE OF LAB ACTIVITIES:			16-05-25 TO 15-06-25

SAM OFFICE-SASTI OC		BSOA1					
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	
06-05-2025	07-05-2025	297	195	63	19	14	Clear sky /light breeze
20-05-2025	21-05-2025	302	184	61	22	16	Sunny / light breeze
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

AREA STORE		BSOA2					
`		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	
06-05-2025	07-05-2025	310	205	66	18	12	Clear sky /light breeze
20-05-2025	21-05-2025	342	220	63	22	16	Sunny / light breeze
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

GOURI COLONY FILTER PLANT		BSOA3				
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	
04-05-2025	05-05-2025	87	42	11	BDL	Sunny / light breeze
05-05-2025	06-05-2025	90	46	14	BDL	Sunny / light breeze
11-05-2025	12-05-2025	86	40	12	BDL	Sunny / light breeze
12-05-2025	13-05-2025	72	35	10	BDL	Sunny / light breeze
18-05-2025	19-05-2025	88	48	11	BDL	Sunny / light breeze
19-05-2025	20-05-2025	89	44	14	BDL	Sunny / light breeze
25-05-2025	26-05-2025	79	40	9	BDL	Sunny / light breeze
26-05-2025	27-05-2025	93	49	11	BDL	Sunny / light breeze
30-05-2025	31-05-2025	90	42	12	BDL	Sunny / light breeze
31-05-2025	01-06-2025	82	40	10	BDL	Sunny / light breeze
NAAQS, 2009		**100**	**60**	**80**	**80**	

SASTI VILLAGE		BSUA4				
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	
04-05-2025	05-05-2025	60	28	14	BDL	Sunny / light breeze
05-05-2025	06-05-2025	66	32	10	BDL	Sunny / light breeze
11-05-2025	12-05-2025	70	36	9	BDL	Sunny / light breeze
12-05-2025	13-05-2025	68	34	12	BDL	Sunny / light breeze
18-05-2025	19-05-2025	62	38	14	BDL	Sunny / light breeze
19-05-2025	20-05-2025	69	42	13	BDL	Sunny / light breeze
25-05-2025	26-05-2025	76	39	12	BDL	Sunny / light breeze
26-05-2025	27-05-2025	70	45	11	BDL	Sunny / light breeze
30-05-2025	31-05-2025	68	40	10	BDL	Sunny / light breeze
31-05-2025	01-06-2025	81	48	14	BDL	Sunny / light 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), TSS: IS 3025-(Part 17), COD: APHA (24th Edition) 5220 C , O & G: IS 3025-(Part 39) & BOD: IS 3025 (Part 44)	
SAMPLING METHOD	LSOP 5	PERIOD OF PERFORMANCE OF LAB ACTIVITIES : 16-05-25 TO 15-06-25

MINE WATER DISCHARGE:	BSOW1			
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
06-05-2025	7.51	24	44	BDL
20-05-2025	7.66	20	52	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

ETP DISCHARGE:	BSOW2			
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
06-05-2025	7.41	26	40	BDL
20-05-2025	7.89	30	56	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

STP(DOMESTIC EFFLUENT)TREATED:	BSOW3	
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS	
	TSS (in mg/l)	BOD(in mg/l)
DETECTION LIMIT	10	2
06-05-2025	24	12.4
20-05-2025	30	14.6
GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENT POLLUTANTS GSR 801E EPA 1993	100	30

Analysed by

Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	TC-7102

NOISE LEVEL MONITORING DATA

SAMPLE DESCRIPTION	NOISE SAMPLE
Test Required	CPCB PROTOCOL FOR AMBIENT NOISE MEASUREMENT
SAMPLING METHOD	LSOP 6

CHP:		BSON1	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
MAY'25	11-05-2025	68.9	62.6
MAY'25	28-05-2025	69.4	63.5
NOISE POLLUTION (REGULATION AND CONTROL) RULES,2000		**75**	**70**

GOURI COLONY:		BSON2	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
MAY'25	11-05-2025	45.5	40.9
MAY'25	28-05-2025	46.5	41.6
NOISE POLLUTION (REGULATION AND CONTROL) RULES,2000		**55**	**45**

Yogesh Pidurkar
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ENVIRONMENTAL MONITORING REPORT

SASTI OC

BALLARPUR AREA

WESTERN COALFIELDS LTD.

JOB NO. 4094423068

JUNE 2025

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	

TEST REPORT NO.	RIN/TR/JUNE-25/48		DATE OF ISSUE	7/25/2025
NAME OF CUSTOMER	GM(ENV.), WCL(HQ), NAGPUR			
TEST REQUIRED	SPM: IS 5182 (Part-4), PM-10: IS-5182 (Part 23), PM2.5: IS 5182 (Part 24), NO2: IS 5182 (Part-06), SO2:IS 5182 (Part-2)			
SAMPLE DESCRIPTION	AIR SAMPLE		SAMPLING PLAN :	LQR 47
SAMPLING METHOD : LSOP 4	PERIOD OF PERFORMANCE OF LAB ACTIVITIES:			16-06-25 TO 15-07-25

SAM OFFICE-SASTI OC		BSOA1					
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	
6/6/2025	6/7/2025	271	199	48	14	11	CLEAR/LIGHT BREEZE
6/20/2025	6/21/2025	234	147	40	12	10	CLOUDY/CALM
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

AREA STORE		BSOA2					
`		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	
6/6/2025	6/7/2025	237	155	37	13	10	CLEAR/LIGHT BREEZE
6/20/2025	6/21/2025	199	121	31	10	BDL	CLOUDY/CALM
STANDARDS FOR COAL MINE, GSR 742(E), dt. 25TH September 2000		**600**	**300**	**-**	**120**	**120**	

GOURI COLONY FILTER PLANT		BSOA3				
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	
6/4/2025	6/5/2025	81	31	10	BDL	CLEAR/LIGHT BREEZE
6/5/2025	6/6/2025	73	26	9	BDL	CLEAR/LIGHT BREEZE
6/11/2025	6/12/2025	86	33	10	BDL	CLEAR/LIGHT BREEZE
6/12/2025	6/13/2025	70	21	8	BDL	CLEAR/LIGHT BREEZE
6/18/2025	6/19/2025	76	23	9	BDL	CLOUDY/CALM
6/19/2025	6/20/2025	61	17	7	BDL	CLOUDY/CALM
6/25/2025	6/26/2025	70	20	8	BDL	CLOUDY/CALM
6/26/2025	6/27/2025	77	24	8	BDL	RAINY/CALM
NAAQS, 2009		**100**	**60**	**80**	**80**	

SASTI VILLAGE		BSUA4				
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	
6/4/2025	6/5/2025	63	17	8	BDL	CLEAR/LIGHT BREEZE
6/5/2025	6/6/2025	81	27	9	BDL	CLEAR/LIGHT BREEZE
6/11/2025	6/12/2025	74	22	8	BDL	CLEAR/LIGHT BREEZE
6/12/2025	6/13/2025	89	26	10	BDL	CLEAR/LIGHT BREEZE
6/18/2025	6/19/2025	76	26	9	BDL	CLOUDY/CALM
6/19/2025	6/20/2025	70	22	8	BDL	CLOUDY/CALM
6/25/2025	6/26/2025	79	27	8	BDL	CLOUDY/CALM
6/26/2025	6/27/2025	61	18	7	BDL	RAINY/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), TSS: IS 3025-(Part 17), COD: APHA (24th Edition) 5220 C , O & G: IS 3025-(Part 39) & BOD: IS 3025 (Part 44)	
SAMPLING METHOD	LSOP 5	PERIOD OF PERFORMANCE OF LAB ACTIVITIES : 16-06-25 TO 15-07-25

MINE WATER DISCHARGE:	BSOW1			
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
6/15/2025	7.84	24	36	BDL
6/29/2025	7.95	36	40	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

ETP DISCHARGE:	BSOW2			
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
6/15/2025	7.86	38	44	BDL
6/29/2025	7.98	40	48	BDL
STANDARDS FOR COAL MINE, GSR 742E, dt. 25/09/2000	5.5 - 9.0	100	250	10

STP(DOMESTIC EFFLUENT)TREATED:	BSOW3	
DATE OF SAMPLE COLLECTION	ANALYSIS RESULTS	
	TSS (in mg/l)	BOD(in mg/l)
DETECTION LIMIT	10	2
6/15/2025	38	14
6/29/2025	36	12
GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENT POLLUTANTS GSR 801E EPA 1993	100	30

Analysed by

Environment Laboratory CMPDI RI-IV, NAGPUR	Test Report	

NOISE LEVEL MONITORING DATA

SAMPLE DESCRIPTION	NOISE SAMPLE
Test Required	CPCB PROTOCOL FOR AMBIENT NOISE MEASUREMENT
SAMPLING METHOD	LSOP 6

CHP:		BSON1	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
JUNE'25	6/11/2025	67.9	63.6
JUNE'25	6/25/2025	68.7	63.8
NOISE POLLUTION (REGULATION AND CONTROL) RULES,2000		**75**	**70**

GOURI COLONY:		BSON2	
MONTH	DATE OF SAMPLE COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
	DETECTION LIMIT	20	20
JUNE'25	6/11/2025	46.5	41.6
JUNE'25	6/25/2025	47.8	42.6
NOISE POLLUTION (REGULATION AND CONTROL) RULES,2000		**55**	**45**

Yogesh Pidurkar
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Annexure – 17

Photos of ETP, Sasti OC Mine

वेस्टर्न कोलफील्ड्स लिमिटेड
WESTERN COALFIELDS LIMITED
(मिनीरत्न कंपनी) (A Miniratna Company)
(कोल इंडिया लि. की अनुषंगी कंपनी)
(A Subsidiary of Coal India Limited)
Regd. Off. : Coal Estate, Civil Lines,
Nagpur(MS) – 440001

CIVIL DEPARTMENT,
WCL HQ, NAGPUR
PHONE /FAX: 0712 – 2510531
email- gmcivil.wcl@coalindia.in
CIN – U10100MH1975GOI018626

Ref. No.: नाग/वेकोलि/सिविल/ 157 दिनांक/Date: 24/05/25

प्रति/To, e-mail – mktg@hamtekindia.com

M/s HAMTEK TECHNOLOGIES INDIA PRIVATE LIMITED
H.NO.8-2-293/82/F/B-23, Road No. 8,
Film Nagar, Jubilee Hills, Hyderabad,
Telangana – 500096, India

Subject: Work of, "Planning, Design, Engineering, Construction, Fabrication, Erection, Supply, Installation, Testing, Trial Run and Commissioning of " One number RCC Silo of 4,000 te capacity with Rapid Loading System, Two Sets of Truck Receiving Stations, RCC overhead Bunker of 12,000 te with Plough Feeders and associated belt conveyors for reclamation of coal from the Truck receiving stations and feeding it to Bunkers and then to the RCC Silo with RLS" (inclusive of all Civil & Structural and Electrical & Mechanical works and allied auxiliary facilities such as Dust Suppression System, Fire Fighting System, Plant Cleaning System, Sampling System, Condition Monitoring System, Drinking Water Supply System, Service Road, General Development, Drainage etc.) on Turnkey Basis for loading of Raw Coal into Rail Wagons at Sasti OCP (10.0 MTY) Project" (Tender ID: 2024_WCL_317167_1) (e06 of 2024-25)

Ref: i) Letter of Acceptance No: नाग/वेकोलि/सिविल/कार्यादेश/2025/113 dated 15.05.2025

Dear Sir,

The subject work was awarded on 15.05.2025 vide above referred Letter of Acceptance (LOA). Your attention is being drawn towards the relevant clauses of LOA. Till now, 'Performance Security' (PS), 'Non-Judicial Stamp paper' and other requisite documents required for execution of Agreement have not been submitted.

It is to remind you that, you have to submit the 'Performance Security' (PS) within 21 days of date of issue of LOA failing which action may be taken as per the conditions of the tender which had been accepted unconditionally during submission of bid.

In terms with the conditions of LOA/ tender, you have to submit following documents which are required for execution of Agreement, within 30 days of issue of LOA:

1) Total Performance Security (PS) for an amount of Rs. 16,07,89,455.00 or Balance Performance Security (PS) for an amount of Rs. 15,57,89,455.00 (if EMD is adjusted against the Performance Security) valid for a period as per relevant clause) of General Terms and Conditions of the NIT.

Contd. p2

वेस्टर्न कोलफील्ड्स लिमिटेड
WESTERN COALFIELDS LIMITED
(मिनीरत्न कंपनी) (A Miniratna Company)
(कोल इंडिया लि. की अनुषंगी कंपनी)
(A Subsidiary of Coal India Limited)
Regd. Off. : Coal Estate, Civil Lines,
Nagpur(MS) – 440001

CIVIL DEPARTMENT,
WCL HQ, NAGPUR
PHONE /FAX: 0712 – 2510531
email- gmcivil.wcl@coalindia.in
CIN – U10100MH1975GOI018626

Azadi Ka Amrit Mahotsav

G20

2) Non-Judicial Stamp Paper of Rs 1000/- (2 Nos. of Rs. 500 each) issued from Maharashtra State.

3) Site handed over and taken over document, jointly signed by Engineer I/c, Ballarpur Area and Contractor, in original.

4) Labour License in the name of firm for the total labours to be employed for the work, duly certified and accepted by Engineer I/c, Ballarpur Area, in original.

5) Contractor's All Risk insurance policy in the joint name of WCL and your firm as per tender conditions and duly accepted by Engineer I/c, Ballarpur Area, in original.

6) Employee compensation insurance policy pledged in the name of WCL and for full contract period as per tender conditions and duly accepted by Engineer I/c, Ballarpur Area, in original.

7) Detailed Time and Progress Chart, jointly signed by Engineer I/c, Ballarpur Area and Contractor as per tender conditions, in original.

8) Copy of finalized Billing Breakup Schedule. The Billing Breakup Schedule (Payment Schedule) should be finalized in consultation with Engineer I/c and forwarded to WCL HQ by Engineer I/c for obtaining approval of Competent Authority.

9) List of Technical staff on letter head of your firm along with copies of their qualification certificate.

10) Valid H.T. Electrical Contractor's license

11) Code of Integrity for Public Procurement (CIPP) as per format given in bid document.

12) Pre-Contract Integrity Pact as per format given in bid document.

13) CMPF / EPF Registration certificate.

14) Certificate on letter head of your Firm that there is no change in constitution of the contracting agency (your Firm), in original.

15) GST Registration in the name of your Firm.

16) Quality Assurance Programme.

17) Bank account in the name of your Firm for Electronic Fund Transfer.

18) PAN card in the name of your Firm.

Contd..p/3

वेस्टर्न कोलफील्ड्स लिमिटेड
WESTERN COALFIELDS LIMITED
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CIVIL DEPARTMENT,
WCL HQ, NAGPUR
PHONE /FAX: 0712 – 2510531
email- gmcivil.wcl@coalindia.in
CIN – U10100MH1975GOI018626

It is requested to comply with the tender/LOA terms and conditions and submit the above-mentioned Performance Security and other documents accordingly in time to avoid any complication for execution of Agreement at the earliest.

भवदीय,

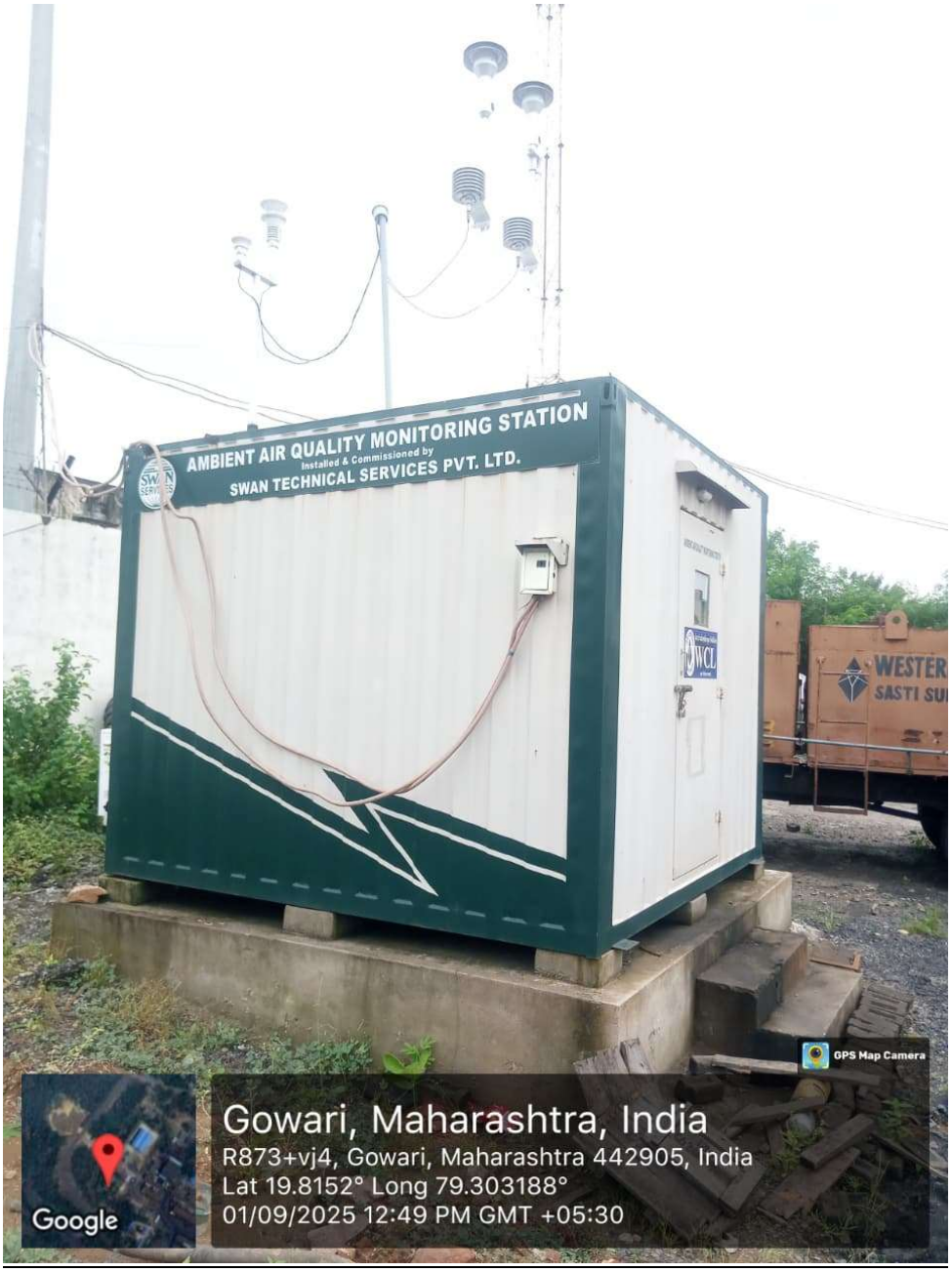
24/05/25

वरिष्ठ प्रबंधक (सिविल)/TC, वेकोलि, नागपूर

Copy to:
1. G.M (Civil)/HOD
2. AGM, Ballarpur Area
3. The Staff Officer (Civil), Ballarpur Area
4. Manager (Civil)/TC

Annexure – 29

Photos of CAAQMS, Sasti OC Mine



वेस्टर्न कोलफील्ड्स लिमिटेड
WESTERN COALFIELDS LIMITED

(कोल इंडिया लि. की अनुषंगी कंपनी)
(A Subsidiary of Coal India Limited)

(मिनीरत्न कंपनी)
(A Miniratna Company)

CAPITAL BUDGET
B.E. 2025-26

वेस्टर्न कोलफील्ड्स लिमिटेड
मिनीरत्ना कंपनी
कोलइंडिया लि. की अनुषंगी कंपनी
योजाना व परियोजना विभाग

WESTERN COALFIELDS LIMITED
A Mininratna Company
A Subsidiary of Coal India Limited
Department of Project & Planning

Email – gmprojects.wcl@coalindia.in
CIN - U10100MH1975GOI08626

☎/FAX: 0712 – 2512350
www.westerncoal.in

पंजी.का: कोयला विहार, सिविल लाइन्स, नागपुर (महाराष्ट्र) - ४४०००१
Regd. Off.: Coal Estate, Civil Lines, Nagpur (MS) - 440001

संदर्भ: NGP/WCL/P&P/2025/Capital Budget/ 70 दिनांक: 08.05.2025

सेवा मे,

The Area General Managers
Ballarpur / Chandrapur / Majri / Wani / Wani North /
Nagpur / Umrer / Pench / Kanhan / PathakheraAreas,CentralWorkshop,Tadali, WCL

विषय:- Capital Budget B.E. 2025-26

महोदय,

WCL Board, in its 375th meeting held on 24th April 2025 has approved B.E 2025-26.

Operational Guidelines for Capital Budget 2025-26:

The following operational guidelines are proposed for adopting B E 2025-26

1. Budget provision indicated against any work does not mean that it is administratively approved. Hence competent approval, wherever necessary, shall have to be obtained with strict adherence to DOP in vogue.

2. Budget provisions may have been shown against projects awaiting sanction. However, expenditure shall be incurred only after the project is approved by competent authority.

3. No budget certification for capital expenditure is to be made against any ongoing cost over-run project. Progressive capital expenditure for each project should be added with capital commitment and only in cases where the sum total is within the sanctioned cost, further capital expenditure may be allowed.

4. Re-appropriation of the budget shall require the approval of competent authority as per DoP in vogue.

5. No fresh commitment / certification is to be made against completed project unless the proposal is approved from WCL HQ.

6. For additional budget requirements, prior approval of competent authority shall be obtained from WCL HQ before providing Budget Certification (BC) and issuing LOI / Work Order. If budget provision available against any spillover item of work is inadequate, budget provided for new works, still remaining

unutilized, can be availed. In such case, necessary approval for re-appropriation is to be obtained.

7. Areas and all departments of WCL HQ shall ensure that BC for Capital Expenditure is obtained only for the expenditure that is proposed to be incurred in the current financial year to avoid unnecessary blockage of budget. If the proposal entails expenditure to be made in the subsequent financial year, the same may be included as Spill-over in the Capital Budget of the relevant financial year and BC provided accordingly after due approval.

8. Capitalization of revenue nature of expenditure in development mines should be cautiously done keeping in view the PR provision and actual deployment of inputs such as manpower, stores, power etc. No attempt should be made to reduce the loss of revenue from mines by transferring the cost to development mines.

9. Areas may submit duly approved proposals seeking Capital Budget Certification to Finance Dept, WCL (HQ) through concerned HoD and GM (P&P).

10. The centralized budget kept under respective head will be provided to Areas on need basis (within the same head) on recommendation of concerned HoD, GM (P&P) and approval of D (T) P&P. Further, the budget kept under Contingency fund will be provided to other Heads on need basis on recommendation of GM (P&P) and approval of D (T) P&P.

11. The Reporting of Head-wise, Project-wise, scheme-wise Capital Expenditure on an accrual basis (including advance or deposit on capital account) duly reconciled with quarterly/annual accounts shall be done by Areas on a monthly basis to Finance Dept, WCL HQ.

Encl.: - A.A.

भवदीय,

8/5/25

महाप्रबंधक (यो/परि/)

Copy for kind information to: -

1. D (P), WCL
2. D (F), WCL
3. DT (OP), WCL
4. DT (P&P), WCL
5. GMs(P&P)/(FIN)/(E&M)/(S&C)/(Excv)/(Env)/(BD)/(Civil)/(L&R)/(Welfare)/(Rescue)/(Admin)/(System), WCL
6. CMS, WCL
7. Mgr. (E&M) P&P / Mgr.(F)P&P, WCL
8. Ch. Mgr.(F) C&B, WCL

CAPITAL BUDGET (BE) (2025-26) ENVIRONMENT HEAD WESTERN COALFIELDS LIMITED
(Rs. in Lakhs)

Note: Budget provided as whole

Sl. No	Name of Mine/Unit	Activity	BE 25-26	spillover	Status	Remarks	Capital Budget 2025-26
		BALLARPUR AREA					
1	Sasti Expansion OC	Construction of STP for colony	0.5		Estimate under preparation	fresh activity to be taken up in FY 25-26	
2	Sasti Expansion OC	Construction of Sedimentation Tank	0.5		Estimate under preparation	fresh activity to be taken up in FY 25-26	
3	Sasti Expansion OC	01 no CAAQMS Complete in all respect		5	Centralised procurement at HQ	Work completed, final payment pending	
4	Sasti Expansion OC	Fixed type sprinklers on haul roads, transportation of coal route, CHP loading & unloading points and other dust generation sources etc.	2		Estimate under preparation	fresh activity to be taken up in FY 25-26	
5	Sasti Expansion OC	6 no of Mist fogger allied activities including electrical works		25.8	centralised procurement from HQ	supply order issued item not delivered	
6	Sasti Expansion OC	Modular STP	0.5		Estimate under preparation	fresh activity to be taken up in FY 25-26	
7	Sasti Expansion OC	Tyre Wash System			Work completed RE under finalisation	Spill over activity	
8	Sasti Expansion OC	Construction of Piezometer & Procurement of DWLR with & with out Telemetry		2	work awarded fro Rs. 15.26 Lakhs, spill over activity	Spill over activity	
9	Sasti Expansion OC	Procrement of lifting Mud pump for DETP STP at colony of 10 HP- 4 nos.	0.5		Estimate under preparation	fresh activity to be taken up in FY 25-26	
10	Sasti Expansion OC	ETP at Sasti OC Mine	0.5		Estimate under preparation	fresh activity to be taken up in FY 25-26	
11	Dhuptala OC	CAAQMS Complete in all respect	51.9		Estimate under preparation, proposal yet to be initiated	Centralised procurement at HQ Level	
12	Dhuptala OC	Tyre Wash System		2	Work completed RE under finalisation	Spill over activity	
13	Dhuptala OC	Construction of Piezometer & Procurement of DWLR with & with out Telemetry		11	Revised location confirmed design sent to Geology deptt	Award value is 16 Lakhs, spill over activity	

CAPITAL BUDGET (BE) (2025-26) ENVIRONMENT HEAD WESTERN COALFIELDS LIMITED
(Rs. in Lakhs)

Note: Budget provided as whole

Sl. No	Name of Mine/Unit	Activity	BE 25-26	spillover	Status	Remarks	Capital Budget 2025-26
14	Dhuptala OC	Modular STP	0.5		Estimate under preparation	fresh activity to be taken up in FY 25-26	
15	Dhuptala OC	RWH at sheds at Dhoptala OC	0.5		Estimate under preparation	fresh activity to be taken up in FY 25-26	
16	Gauri Pauni Expn. OC	Construction of Sedimentation Tank	0.5		Estimate under preparation	fresh activity to be taken up in FY 25-26	
17	Gauri Pauni Expn. OC	Construction of ETP	0.2		Estimate under preparation	fresh activity to be taken up in FY 25-26	
18	Gauri Pauni Expn. OC	Fixed type sprinklers on haul roads, transportation of coal route, CHP loading & unloading points and other dust generation	0.5		Estimate under preparation	fresh activity to be taken up in FY 25-26	
19	Gauri Pauni Expn. OC	Modular STP	0.5		Estimate under preparation	fresh activity to be taken up in FY 25-26	
20	Gauri Pauni Expn. OC	Tyre Wash System	0.5		Estimate under preparation	fresh activity to be taken up in FY 25-26	
21	Gauri Pauni Expn. OC	6 no of Mist fogger allied activities including electrical works		25.8	centralised procurement from HQ	supply order issued , spill over activity	
22	Gauri Pauni Expn. OC	Construction of Piezometer & Procurement of DWLR with & with out Telemetry	2		Estimate under preparation	fresh activity to be taken up in FY 25-26	
23	Gauri Pauni Expn. OC	Sewarage system for Gauri Colony	0.1		Estimate under preparation	fresh activity to be taken up in FY 25-26	
24	Gauri Pauni Expn. OC	Construction of STP for Gouri Colony	0.1		Estimate under preparation	fresh activity to be taken up in FY 25-26	
25	Gauri Pauni Expn. OC	Wind barrier system	0.5		Estimate under preparation	fresh activity to be taken up in FY 25-26	
26	Gauri Pauni Expn. OC	CAAQMS Complete in all respect	51.9		Estimate under preparation	Centralised procurement at HQ Level	
27	Gourideep OC	CAAQMS Complete in all respect			Work completed, commisioning issued	Liability	
28	Gourideep OC	Tyre Wash System	0.1		Estimate under preparation	fresh activity to be taken up in FY 25-26	
29	Gourideep OC	Construction of wind Barrier/Metal curtain along railway track			Work awarded for 175 Lakhs work completed RE under preparation	liability of Rs.10 Lakhs approx	
30	Gourideep OC	Providing rain-guns at dust suppression source	0.2		Estimate under preparation	fresh activity to be taken up in FY 25-26	

CAPITAL BUDGET (BE) (2025-26) ENVIRONMENT HEAD WESTERN COALFIELDS LIMITED
(Rs. in Lakhs)

Note: Budget provided as whole

Sl. No	Name of Mine/Unit	Activity	BE 25-26	spillover	Status	Remarks	Capital Budget 2025-26
31	Gourideep OC	6 no of Mist fogger allied activities including electrical works		25.8	centralised procurement from HQ	supply order issued, spill over activity	
32	Gourideep OC	Construction of Piezometer & Procurement of DWLR with & with out Telemetry		2	Work awarded for 11.54 Lakhs work yet to be completed	work awarded spill over to be taken up in 25-26	
33	Pauni II Expn OC	Construction of rrom with electrical fitting for CAAQMS			Wrok award value 3.09 lakhs, work completed	RE under approval, liability.	
34	Pauni II Expn OC	5 no of Mist fogger allied activities including electrical works		21.5	centralised procurement from HQ	supply order issued, spill over activity	
35	Pauni II Expn OC	Tyre Wash System		20	Work award value is Rs.39.8 lakhs	work yet to be completed, spill over activity.	
36	Pauni II Expn OC	Fixed sprinklers around coal stock yard no-4	0.5		Estimate under preparation	fresh activity to be taken up in FY 25-26	
37	Pauni II Expn OC	Modular STP	0.5		Estimate under preparation	fresh activity to be taken up in FY 25-26	
38	Ballarpur OC	Construction of Piezometer & Procurement of DWLR with & with out Telemetry		2	Work award value Rs.8.34 Lakhs, work still under progress	spill over activity.	
39	Ballarpur OC	CAAQMS Complete in all respect	51.9		Estimate under preparation	Centralised procurement at HQ Level	
40	Ballarpur OC	Tyre Wash System	0.3		Estimate under preparation	fresh activity to be taken up in FY 25-26	
41	Ballarpur OC	Modular STP	0.5		Estimate under preparation	fresh activity to be taken up in FY 25-26	
42	Ballarpur UG	CAAQMS in all respect	50		Estimate under preparation	Centralised procurement at HQ Level	
43	Ballarpur UG	Construction of Piezometer & Procurement of DWLR with & with out Telemetry	0.3		Tender failed in FY 2024-25	fresh activity to be taken up in FY 25-26	
44	AHQ	Procurement of flowmeters at Ballarpur Area	0.1		Estimate under preparation	fresh activity to be taken up in FY 25-26	
45	AHQ	Procurement and installation of piezometers at Ballarpur Area	0.1		Estimate under preparation	fresh activity to be taken up in FY 25-26	
46	Misc	Misc. Activities(Piezometer/DWFM/activities in compliance of statutory conditions of CTO/EC/Directives of Regulatry authority in Mines/Units of Area required.)etc	0.1				
			218.8	142.9			
BALLARPUR AREA Total			381.53				

ANNEXURE 5

ROLES , RESPONSIBLITIES & AUTHORITIES SPECIFIC TO THIS IMS

Sl No	Responsible Functionary	Roles , responsibilities and authorities relevant to this Management System
1	**CMD & Directors**	• Establishing the Management policy and objectives. • Approving the initial IMS documents as well as any changes to it. • Providing resources for the implementation of the IMS. • Demonstrating their commitment towards this IMS. • Reviewing the performance of the IMS periodically. • Assigning & communicating the relevant roles & responsibilities to all. • Ensuring specified communication with government bodies & WCL Projects.
2	**GM/HOD of Units & Departments**	• Identifying and arranging resources (financial, material, manpower) for the effective implementation of IMS. • Deciding and ensuring documentation of departmental Work Instruction manual &operational process-flow of their work. • Approving the departmental work instruction manual as well as any changes to it. • Providing technical and administrative assistance to all within the Department. • Deciding the need for outsourcing of any process and exercising necessary controls on outsourced process. • Ensuring that IMS is understood and implemented within own functional domain. • Receiving customer complaints and forwarding to concerned persons. • Communicate with FDs/GM/TS/Nodal Officer (IMS)/HODs and all concerned in matters related to IMS. • Continuously monitor the effectiveness of all declared controls within their functional domains. • For the respective field unit, arranging the environmental/OH&S review for all processes/facilities and propose the management objectives for the financial year as declared in the system. • GM/Head of the Project/Unit or the HOD (Dept.) will provide access to their premises and all information to the system auditors, whether internal or external, whenever required. • Identifying, reviewing, determining the causes and deciding upon the correction, corrective & preventive actions for non-conformities of the internal audits. Reviewing the compliance and effectiveness of such actions. • Any other roles and responsibilities as proposed in this IMS Manual.

3	**Apex Coordinator (IMS) / Nodal Officer(IMS), WCL, HQ**	• Distribution of IMS manuals after approval by CMD. • Review, update, change of IMS documents, when necessary, and arranging re-approval. • Ensuring that integrity of the established IMS is maintained during all changes. • Ensuring that the processes of IMS are established implemented and maintained in WCL. • Ensuring that the IMS conform to the requirements of ISO 9001:2015, ISO 14001:2015, and ISO 45001:2018. • Reporting to CMD and all concerned the performance of IMS and any need for its improvement through proper channel. • Arranging to conduct internal audit and its reporting periodically. • Reviewing the compliance and effectiveness of correction, corrective & preventive actions for non-conformities of the internal audits. • Selection of external Certification Body and constant liaison with them. • Ensuring that the Management Review Meetings are conducted, documented, recorded and communicated for taking decided actions in time. • Communicating directly with all in matters related to IMS. • Conducting the environmental / OH&S review for all processes/facilities of WCL HQ and propose the management objectives for the financial year as declared in the system • Any other roles and responsibilities as proposed in this IMS Manual.
4	**Nodal Officer(IMS) for field units**	• Providing assistance on defined controls of IMS. • Conducting Environmental / OH&S review for its unit and maintain the review & performance record. • Arranging to conduct internal audit periodically. • Recording, classifying, deciding and arranging responses on all received communications on IMS. • Liaison with CMPDIL, Certification Body, & Nodal Officer (IMS), WCLHQ. • Framing Management Objectives, Targets& Action Plans for the unit on the basis of initial environmental & OH&S review record. • Any other roles and responsibilities as proposed in this IMS Manual.
5	**All employees of WCL**	• Ensuring proper storage and protection of all office records. • Awareness of the requirements of the standards and the documented arrangement of this IMS. • Understanding the benefits of improved IMS performance. • Committing to safeguard the company's facilities. • Utilizing the provided resources optimally.
6	**Health & Safety Committee**	• Conduct periodic/annual OH&S risk assessment including identification and analysis and prioritization. • Recommend mitigative action to GM/Head (TS), HQ on the prioritized hazards. • Reviewing the actions taken to mitigate the hazards. • For continually improving the health and safety conditions at the workplace. • Any other roles and responsibilities as proposed in this IMS Manual.
7	**Internal Auditors**	• Apart from designated responsibilities, providing assistance on defined controls of IMS. • Conduct internal audit periodically as per the audit plan circulated by Nodal Officer (IMS), WCL HQ. • Assisting the auditee to surface improvement opportunities through the implementation of the IMS in the company • Making himself/herself aware about the requirements of the international standards and also to act as key agents for the implementation of the system • Any other roles and responsibilities as proposed in this IMS Manual.

8	**AEO (Area Environment Officer)**	1. In charge of all environmental activities in the Project/s of his area. 2. Ensuring compliance of EMP provisions approved by MOEF and procuring periodical reports from the Projects as required; 3. Responsibility for preparation and implementation of Project/Mine wise Environmental Action Plan (EAP) in the area considering all aspects of environment; 4. Arranging for Aspect/Impact analysis for the units in the Area under the jurisdiction for setting Objectives & Targets; 5. Arranging periodical management review of implementation of Objectives and Targets, budget, compliance of legal requirements etc related to the Area; 6. Maintaining a Documentation Cell, books & journals, Laws & Rules applicable, Codes, Manuals etc; 7. Ensuring organizational development by providing sufficient manpower and training for effective performance of the units in his Area; 8. Ensuring proper monitoring system; 9. Any other job assigned by the controlling officer from time to time.
9	**PEO**	1. Responsible for implementation of all environment related works under his jurisdiction in close coordination with the concerned Project Officer and environment Discipline Head; preparing environmental budget (Capital & Revenue), annual expenditure statement, cost code for project. 2. Reporting and submitting status report of Environment Management Programme to the Environment Dept Head/Controlling Officer. 3. Responsibility for data collection and preparing EMP for obtaining approval of MOEF. Responsibility for implementation of the EMP conditions / stipulations imposed by MOEF. Under the framework of EMP responsibility for preparation of annual EAP and implementation thereof. 4. Monitoring Environmental Quality for emissions, discharges, noise, blasting vibration, etc. as may be needed by Law and preparing Environmental statement and ensuring timely payment of Cess. 5. Responsibility for obtaining consent letters for emission and discharges and ensuring implementation of general and special conditions imposed by State Pollution Control Board (SPCB) or any other legal authority. 6. Responsibility for operation of ETP, STP and other facilities provided for environmental mitigation and ensuring proper handling & disposal of solids waste, hazardous waste, maximum recovery of waste oil and its storage & disposal; 7. Ensuring effective water spraying and sprinkling for dust suppression and overall good House-keeping; 8. Taking all care for conservation of natural resources like topsoil, water, POL etc; 9. Any other job assigned by the controlling officer from time to time.

...posed of till date, Pandey submitted.

...19...

...page 1)

...aid that five persons against whom the police had ...offences were also acquitted in the case.

...esignated court while acquitted five persons in the ...ed by the state police, convicted them under the case ...y CBI under section 302 and 193 of IPC and sentenced ...five years imprisonment and Rs 1,000 fine. The accused, ...o were given lifer, are Chiman Singh, Yahiya Dhebar, ...bhay Goel, Shivendra Singh Parihar, Firoz Siddiqui, Vikram ...harma, Vinod Singh Rathor, Rakesh Kumar Sharma, Ashok Kumar Bhaduria, Sanjay Singh Kushwaha, Raju Bhaduria, Ravi Singh Kushwaha, Narsi Sharma, Satyendra Singh Tomar, Vivek Bhaduria, Lala Bhaduria, Sunil Gupta, Anil Pachauri and Harish Chader. All of them except Shivendra Singh Parihar were convicted under sections 302 and 120-B of Indian Penal Code. Shivendra was handed over a life sentence under Section 302. The policemen, who have been sentenced to five years ...ail and Rs 1000 fine, are the then DSP Amrik Singh Gill, R ...Trivedi and the then Maudahpara SHO V K Pandey under ...Sections 193, 218 and 120-B. Upon non payment of the fine, ...hey will serve another three months in jail.

The five persons who were acquitted in the police case but ...convicted to five years imprisonment and Rs 1000 fine in the ...case filed by CBI are Lallan Singh alias Avinash Singh, Jamvant ...Kashyap, Shyam Sunder, Vinod Singh and Vishwanath Rajbhar ...nder section 302 and 193. Besides, Suryakant Tiwari was ...lso sentenced to five years imprisonment and Rs 1,000 fine ...nder section 193 and 120 (B). In case of non payment of the ...ine, these convicts will have to stay in jail for another three ...months. Two of the accused, Suresh Singh and Bulti Pathak, ...ad already turned approvers in the case.

Soon after the verdict, Amit and Chiman Singh were tak...n to the Raipur Central Jail. The court also directed the police ...o release Amit. The Central Bureau of Investigation (CBI), ...which was handed over the investigation in January 2004, after ...he Bharatiya Janata Party came to power in December 2003, ...ad framed charges against Amit and 30 others in April 2004 ...nder sections 302, 120-B, 427, 193, 218 and 34 of the Indian ...Penal Code. Tight security arrangements were made in the ...ourt premises on Thursday and the people entering the court ...ere frisked thoroughly. Jaggi was murdered on June 4, 2003 ...round 11.30 pm near the Maudahpara Police Station here and ...wo separate cases were registered with the Maudahpara Police ...station in the same year by the then SHO V K Pandey and ...Jaggi's son Satish Jaggi respectively.

After the CBI was handed over the case, Special Investigating Officer U K Goswami started the investigation and later Deputy Superintendent of Police (CBI) ... Kaul took over the investigation in April, 2004.

The fixed tenure would not be applicable to such officers who are to retire, go on promotion, training or leave, the sources said.

The decision was conveyed to the states during a high-level meeting here chaired by Department of Personnel and Training Secy Satyananda Mishra and attended by Chief Secretaries and senior officials from states.

The meeting was called here by the DoPT to discuss the fixed tenure for IAS officers to save honest officers from mass transfer of officials that often come with change of guard in states and constitute committees for appointments of Chief Secretary, Director General of Police and while others favoured inclusion of certain safeguards to ensure that the states' inherent powers to transfer are not infringed on. Principal Secretary of Jammu and Kashmir Khursheed Ganai informed the meeting that state was in principle in agreement with a two-year tenure for an IAS officer but subject to conditions.

"We have given our opinion to the Department of Personnel and Training that the state was not averse for a two-year tenure of an IAS officer subject to some conditions like the state government is free to transfer any officer, holding any post, even before completion of the tenure as per the decision of the Chief Minister.

Satish Jaggi may move SC

SOON after the court pronounced the verdict, Satish Jaggi, son of NCP leader Ramavtar Jaggi, said that he respected the judgement and said that Amit Jogi was given the benefit of doubt. The cancellation of Amit's bail by the Supreme Court enhanced the Jaggi family's faith in the judiciary.

Satish made it clear that they would fight the case up to the Supreme Court and the later course of action in this regard would be decided after the fourth death anniversary of his father. He further said that the court proved that the police case in the case was fake.

Western Coalfields Ltd.
(A Subsidiary of Coal India Ltd.)

NOTICE

Sub : Ambara Underground Coal Mine Project of Western Coalfields Limited located in village Ambara Tah : Juunnardeo, Dist Chhindwara (MP). Environmental clearance has been accorded for the Ambara Underground Coal Mine of Western Coalfields Limited, Kanhan Area for **0.20 million tones per annum (MTPA) of coal production** and a copy of the clearance letter is available with the Madhya Pradesh Pollution Control Board and may also be seen at website of the Ministry of Environment and Forests (MOEF) at http ://envfor.nic.in

Sub : Expansion of Mahadeopuri Underground Coal Mine Project of Western Coalfields Limited located in Village Khamra Tah : Parasia Dist : Chhindwara (MP).Environmental clearance has been accorded for the Expansion of Mahadeopuri Underground Coal Mine of Western Coalfields Limited, Pench Area for **0.25 million tones per annum (MTPA)** of coal **production** and a copy of the clearance letter is available with the Madhya Pradesh Pollution Control Board and may also be seen at website of the Ministry of Environment and Forests (MOEF) at http ://envfor.nic.in

Sub : Singhori Open Cast Coal Mine Project of Western Coalfields Limited located near Village Singhori, Tah : Parseoni, Dist : Nagpur (Maharashtra). Environmental clearance has been accorded for the Singhori Open Cast Coal Mine of Western Coalfields Limited, Nagpur Area for **0.80 million tones per annum (MTPA) of coal production** and a copy of the clearance letter is available with the Maharashtra Pollution Control Board and may also be seen at website of the Ministry of Environment and Forests (MOEF) at http ://envfor.nic.in

Sub : Sasti Expansion Open Cast Coal Mine Project (production from 1.60 MTPA to 2.50 MTPA and lease from 714.09 ha to 919.69 ha) of Western Coalfields Limited located near Village Sasti Tah : Rajura, Dist : Nagpur (Maharashtra). Environmental clearance has been accorded for the Expansion of Sasti Open Cast Coal Mine of Western Coalfields Limited, Ballarpur Area for **1.60 million tones per annum (MTPA) to 2.50 MTPA of coal production** and Lease area from 714.09 ha to 919.69 ha. a copy of the clearance letter is available with the Maharashtra Pollution Control Board and may also be seen at website of the Ministry of Environment and Forests (MOEF) at http ://envfor.nic.in

Sub : Dhorwasa Expansion Open Cast Coal Mine Project (production from 0.55 MTPA to 1.40 MTPA and lease area from 207.31 ha to 229.56 ha) of Western Coalfields Limited located in Village Dhorwasa Tah : Bhadrawati Dist : Chandrapur (Maharashtra). Environmental clearance has been accorded for the Dhorwasa Expansion Open Cast Coal Mine of Western Coalfields Limited, Majri Area for **0.55 million tones per annum (MTPA) to 1.40 MTPA of coal production** and lease area from 207.31 ha to 229.56 ha and a copy of the clearance letter is available with the Maharashtra Pollution Control Board and may also be seen at website of the Ministry of Environment and Forests (MOEF) at http ://envfor.nic.in

Sub : Rajur Underground Coal Mine Project of Western Coalfields Limited located in Village Rajur, Tah : Wani, Dist : Yavatmal (Maharashtra). Environmental clearance has been accorded for the Rajur Underground Coal Mine of Western Coalfields Limited, Wani North Area for **0.21 million tones per annum (MTPA) of coal production** and a copy of the clearance letter is available with the Maharashtra Pollution Control Board and may also be seen at website of the Ministry of Environment and Forests (MOEF) at http ://envfor.nic.in

Nitawada 1st/06/07

(4) Mahavidarbha Chandrapur 1/6/07

तणसाला आग लागल्याने लाखाचे नुकसान

चंद्रपूर (का.प्र.)-सिंदेवाही तालुक्यातील नवरगाव परिसरात शेतात बैलांच्या वैरणीकरीता काढून ठेवलेल्या तणसाच्या ढिगाला आग लागल्याने संबंधीत शेतकऱ्यांचे लाखो रूपयाचे नुकसान झाले आहे.

नवरगाव परिसरातील फुटका तलाव भागात शेतकऱ्यानी पुढील वैरणीकरीता तणसाचे ढिगारे जमा करून ठेवले होते. मात्र या परिसरात सध्या रोहयो अंतर्गत तलावाच्या खोलीकरणाचे काम सुरू असून कामावर असलेल्या मजुरांनी येथे कचरा जाळण्याकरीता आग लावली. मात्र ती हवेमुळे पसरत जाऊन जवळच असलेल्या तब्बल १० तणसाच्या ढिगाना आग लागली व सारे तणीस आगिच्या भक्ष्मस्थानी पडले. या वर्षी आधीच कमी उत्पन्न झाल्याने वैरणही कमी निघाले. त्यातच उरलेले सारेच वैरण आगीच जळाल्याने जनावरांच्या चांऱ्याचा मोठा प्रश्न शेतकऱ्यांसमोर निर्माण झाला असून संबंधीत शेतकऱ्यांना शासनाने तोत्काळ नुकसान भरपाई देण्याची मागणी करण्यात येत आहे.

मच्छीनाला प्रदूषणाच्या विळख्यात

चंद्रपूर (का.प्र.)-

मच्छीनाल्यात गेल्या काही दिवसांपासून प्रदूषणाचे केंद्र बनत चालली असून यामध्ये प्लॅस्टिक पिशव्या मोठ्या प्रमाणावर टाकल्या जात आहेत. इतकेच नाहीतर सडले कुजलेले अन्न व फळे सुध्दा टाकण्यात येतात. यामुळे परिसरातील नागरिकांच्या आरोग्यावर परिणाम घेऊ लागला आहे. नुकतेच पर्यावरण मंत्र्यांनी जिल्ह्याला भेट दिली. पर्यावरण विभागाने याकडे लक्ष देण्याची मागणी जोर धरू लागली आहे.(पि)

वेस्टर्न कोलफिल्डस लि.

(कोल इण्डिया लिमिटेड की उपकंपनी)

सूचना

विषय: वेस्टर्न कोलफिल्डस लिमिटेड ची सास्ती विस्तारीत खुली खाण मु.पो. सास्ती, ता. चांदुर, जि. चंद्रपुर (महाराष्ट्र) साठी पर्यावरण स्वीकृती.

वेस्टर्न कोलफिल्डस लिमिटेड अंतर्गत बल्लारपुर क्षेत्रामधील सास्ती विस्तारीत खुल्या खाणीस 1.60 मिलियन टन प्रतिवर्ष पासुन 2.50 मिलियन टन प्रतिवर्ष पर्यंत कोळसा उत्पादनासाठी व लीज क्षेत्र 714.09 हेक्टर पासुन 919.69 हेक्टर पर्यंत वाढविण्यास वन आणि पर्यावरण मंत्रालया द्वारे पर्यावरण स्वीकृती विलेली आहे. पर्यावरण स्वीकृतीच्या पत्राची प्रत महाराष्ट्र प्रदुषण नियंत्रण मंडळ यांच्याकडे उपलब्ध आहे आणि वन आणि पर्यावरण मंत्रालयाच्या खाली दिलेल्या वेबसाइट वरती सुद्दा पाहु शकता. http://envfor.nic.in

विषय: वेस्टर्न कोलफिल्डस लिमिटेड ची ढोरवासा विस्तारीत खुली खाण, मु.पो. ढोरवासा, ता. भद्रावती, जि. चंद्रपुर (महाराष्ट्र) साठी पर्यावरण स्वीकृती.

वेस्टर्न कोलफिल्डस लिमिटेड अंतर्गत चंद्रपुर क्षेत्रामधील ढोरवाशा विस्तारीत खुल्या खाणीस 0.55 मिलियन टन प्रतिवर्ष पासुन 1.40 मिलियन टन प्रतिवर्ष पर्यंत कोळसा उत्पादनासाठी व लीज क्षेत्र 207.31 हेक्टर पासुन 229.56 हेक्टर पर्यंत वाढविण्यास वन आणि पर्यावरण मंत्रालया द्वारे पर्यावरण स्वीकृती दिलेली आहे. पर्यावरण स्वीकृतीच्या पत्राची प्रत महाराष्ट्र प्रदुषण नियंत्रण मंडळ यांच्याकडे उपलब्ध आहे आणि वन आणि पर्यावरण मंत्रालयाच्या खाली दिलेल्या वेबसाइट वरती सुद्दा पाहु शकता. http://envfor.nic.in

पाहिजेत

राष्ट्रीय अपंग पुनर्वास योजनेअंतर्गत चंद्रपूर, चंद्रपूर

राष्ट्रीय अपंग पुनर्वास योजनेअंतर्गत चंद्रपूर जिल्ह्यातील तालुका पातळीवर काम करण्यासाठी एम.आर. डब्ल्यू. (बहुउद्देशीय पुनर्वसन कार्यकर्ता) या पदाकरीता निवड करण्यासाठी खालील पात्रताधारक व इच्छूक उमेदवारांनी १५ जून २००७ रोजी सकाळी ११.०० वाजता शैक्षणिक पात्रता प्रमाणपत्रासह व रहीवाशी दाखल्यासह मुलाखतीस स्वखर्चाने जिल्हाधिकारी, चंद्रपूर यांचे कार्यालयात उपस्थित राहावे. स्थानिक उमेदवारांना प्राधान्य देण्यात येईल.

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समाज कल्याण अधिकारी (गट -अ) प्राचार्य जिल्हाधिकारी

स्वा. सावरकरांना भारतरत्न मागणीसाठी खा. अहीर यां

चंद्रपूर (का.प्र.) : स्वातंत्र्यपूर्व काळात क्रांतीच्या माध्यमातून भारताला स्वतंत्र करण्यांत ज्यां क्रांतीकारकांनी सहभाग घेतला त्यातील मुकूटमणी असणारे स्वातंत्र्यवीर सावरकर यांना मरणोत्तर भारतरत्न देण्याच्या मागणीचे निवेदन वीर सावरकर फ्रंट तर्फे देण्यांत आले. स्वा. सावरकरांचे जन्मदिनाचे औचित्य साधून वीर सारकर फ्रंटचे अध्यक्ष गिरीश अंबाडे यांच्या मेतृतवात जिल्हाधिकारी, चंद्रपूर यांच्यासह चंद्रपूरचे लोकप्रिय खासदार हंसराज अहीर यांना सुद्धा मागणीचे निवेदन देवून केंद्र सरकार स्तरावर या मागणी पूर्तीसाठी पाठपुरावा करण्यी विनंती वीर सावरकर फ्रंटच्या शिष्ट मंडळाने त्यंची भेट घेवून केली.

स्वा. सावरकरांचे स्वातंत्र संग्रामातील अतुलनीय योगदान आणि त्यांचे उस्तुंग व्यक्तीमत्व पाहता केंद्र सरकारने त्यांची दखल घेवून थापूर्वीच त्यांना भारतत्न दिले पाहिजे होते असे सांगत खा. अहीर यांनी या वीरोत्तमाला भारतत्न सन्मान मिळवून देण्यासाठी संसदेच्या माध्यमाने प्रयत्न करणार असल्याचे व यासाठी संसदेच्या दोन्ही सभागृहातातील सदस्यांनाही याचा पाठपुरावा करण्यासाठी विनंती पत्रे पाठविणार असल्याची माहिती फ्रंटच्या शिष्टमंडळाला दिली. हे सर्व पहिल्या भारतीय स्वातंत्र्यसमराचे १५० वर्ष असल्याने देशातील शहिद व स्वातंत्र्य संग्रामात योगदान देणाऱ्यांचे स्मरण सार्वत्रिक होत आहे. १८५७ च्या स्वातंत्र्य समराचे महत्व स्वा. सावरकरांनीच भारतीयांना सांगितले, स्वातंत्र्य समराला सोनेरी पान संबोधून युवकांना प्रेरीत करणाऱ्या स्वातंत्र्यविरांचे हे अमुल्य

आर्थिक कपातीचा संघटनात्

चंद्रपूर (का.प्र.):

चंद्रपूर पंचायत समिती अंतर्गत कार्यरत असणाऱ्या नक्षलग्रस्त भत्ता कपातीच्या धोरणाचा निषेध व मासिक वेतनावर बहिष्कार घालणार असे संघटनात्मक निवेदनाद्वारे मुकाअ व मुख्य विलेखा जि.प. चंद्रपूर यांना दिले आहे.

नक्षलग्रस्त भत्ता लागू करण्यांत आला असून मागील वर्षापासून फक्त शिक्षकांना नक्षलग्रस्त भत्ता माहे मे व जून चा कपात करण्यांत आला. माहे मे ६ व जून ६ चा नक्षलग्रस्त १५ टक्के भत्ता माहे मे २००७ चा भत्ताही कपात करण्याची कार्यवाही सुरू आहे. शैक्षणिक सत्र १० महिने व २ महिने विद्यार्थ्यांना मानसशास्त्रीय आधारावर मानसिक स्वास्थ योग्य राहावे, म्हणून त्यांना शालेय बाबीपासून आराम मिळावा म्हणून सुट्ट्याचे धोरण अनेक वर्षांपासून राबविण्यांत येत आहे. परंतु शालेय व्यवस्थापन व शासन नियमावलीनुसार शिक्षकांचे दैनंदिन कामकाज, विविध शालेय कार्य, प्रशिक्षण वर्ग त्याप्रमाणे सदर कालावधीचे पूर्ण वेतन देयक सादर करून पगारास पात्र दिवसांना अनुसरून मासिक देयक काढण्यांत

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पर अनाथ स्कूल के विद्यार्थियों को स्कूली सामग्री एवं जीवनावश्यक वस्तुओं की किट उपस्थित मान्यवरों के हाथों वितरित की गई. लाभार्थियों को मुक्त यही सीख देते हैं कि जहां सेवा है वही ईश्वर होता है भाजपा की ओर से लोगों की सेवा के लिए प्रत्येक कार्यक्रम लिए जाते हैं. संचालन साजन गोहणे ने किया. सुनीता पाटील, चंद्रक शबाना शेख, सलमा शे पेंदोर, श्रीनिवास येरलाव लिहीतकर एवं बडी नागरिक उपस्थित थे.

गोमाता की रक्षा के लिए आगे आएं, सभी करें अच्छे प्रयास-फाये

कुरखेडा (प्रति)- अन्नदाता किसान अपने खेत में बैलों के साथ पसीना बहाता है. सालभर मेहनत करता है. लेकिन अनेक किसान बांधव बैल व गाय वृद्ध होने पर उन्हें कसाई को बेचने के मामले दिखाई देते हैं. यह गलत है, गोवंश का संवर्धन करने की आवश्यकता है. गोमाता की रक्षा के लिए किसानों को आगे आने की जरूरत है, ऐसा कथन विश्व हिंदू परिषद के जिलाध्यक्ष तथा कुरखेडा श्रीराम मंदिर के अध्यक्ष वामनराव फाये ने किया. कुरखेडा में श्रीराम उत्सव समिति की ओर से आयोजित भव्य सार्वजनिक तान्हा पोला महोत्सव में वे अध्यक्षीय मार्गदर्शन करते हुए बोल रहे थे. मंच पर शहर विचार मंच कुरखेडा के संयोजक माधवदास निरंकारी, पूर्व कृउबास संचालक दोषहर फाये, पूर्व नगराध्यक्ष व वर्तमान पार्षद रवींद्र गोटेफोडे, कांग्रेस के जिला उपाध्यक्ष जयंत हरडे, वनपरिक्षेत्र अधिकारी कैलास धोंडने, बैंक मैनेजर उल्हास महाजन, सभापति अतुल झोडे, पार्षद रामभाऊ वैद्ये, पार्षद सागर निरंकारी, पार्षद अल्का गिरडकर, डा. बाबुलाल कावले, कृषि उपज बाजार समिति के संचालक मोनेश मेश्राम, अशोक मेश्राम, शिवा वडीकर, टिकाराम डोंगरवार, राजू हरडे, पूर्व जिप सदस्य आशा कुमरे, सुधा नाकाडे आशा बानबले, गितेश्वर उईकेख, मनिष फाये, हुंडीराज फाये, सुधाकर वैरागडे, उल्हास देशमुख, रोशन कुंभलवार व कुरखेडा के प्रतिष्ठित नागरिक उपस्थित थे. इस समय श्रीराम मंदिर, श्रीराम नगर कुरखेडा में आयोजित तान्हा पोला महोत्सव के दौरान सैंकडों की संख्या में बच्चों ने सहभाग लिया. इस दौरान बच्चों ने वेशभूषा नंदीबैल सजावट स्पर्धा में सहभाग लेकर पुरस्कार प्राप्त किया. स्पर्धा में प्रथम गुट अ छत्रपती शिवाजी महाराज गुट प्रथम पुरस्कार १११११, दितीय पुरस्कार ७७७७, तृतीय ४४४४ व दूसरा गुट ब भारतरत्न डा. बाबासाहब आंबेडकर गुट प्रथम पुरस्कार ७७७७, द्वितीय ५५५५, तृतीय ३३३३ व दोनों गुट में प्रत्येकी ४ प्रोत्साहन पर ११११ पुरस्कार दिया गया. पंजीयन किए गए स्पर्धकों से ही लकी ड्रा निकाला गया. इस दौरान साइकिल, मिक्सर मशीन, टेबल पंखा, व विभिन्न उपयोगी साहित्य व बालगोपालों को प्रमाणपत्र, पुरस्कार दिया गया.

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Coal Estate, Civil Lines, Nagpur - 440001, Maharashtra, India. Website - www.westerncoal.in

NOTICE

Environmental Clearance has been accorded for Expansion of Sasti OCP of Ballarpur Area, WCL for increase in Mine Lease area from 919.69 ha to 1120.48 ha with production capacity of 2.50 MTPA by Ministry of Environment, Forests & Climate Change vide letter no. J-11015/435/2006-IA.II(M) dated 13/09/2023 and a copy of the clearance letter may also be seen at website of the Ministry of Environment, Forests & Climate Change (MoEF & CC) at
http://environmentclearance.nic.in

शिक्षिका जां

राजुरा (ता.प्र.)- ि
प्राथमिक स्कूल आर्वी
शिक्षिका करुणा गावंडे
को शिक्षक ध्येय संस्था
से शिक्षक दिन पर रा
कर्तव्य पुरस्कार से सम्म
गया. शिक्षक ध्येय के
राज्यस्तरीय उपक्रम
आयोजन किया गया. ि
काम को प्रोत्साहन देन
स्पर्धा का लक्ष्य था. इ
गावंडे ने अपनी स्कूल
विषय से संबंधित नवोप
नवोपक्रम का प्राथमि

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परेशानियों का सामना
रहा है. जिससे आल
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करने निधि उपलब्ध व
निर्माणकार्य पूर्ण करे,
पूर्व जिप अध्यक्ष
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हैं. किंतु उस जगह य
उचित सुविधा मिल रहे
इसका ध्यान रखना आव
लेकिन इस ओर अनदे
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का सामना करना पड र

Chandrapur Samachar Chandrapur
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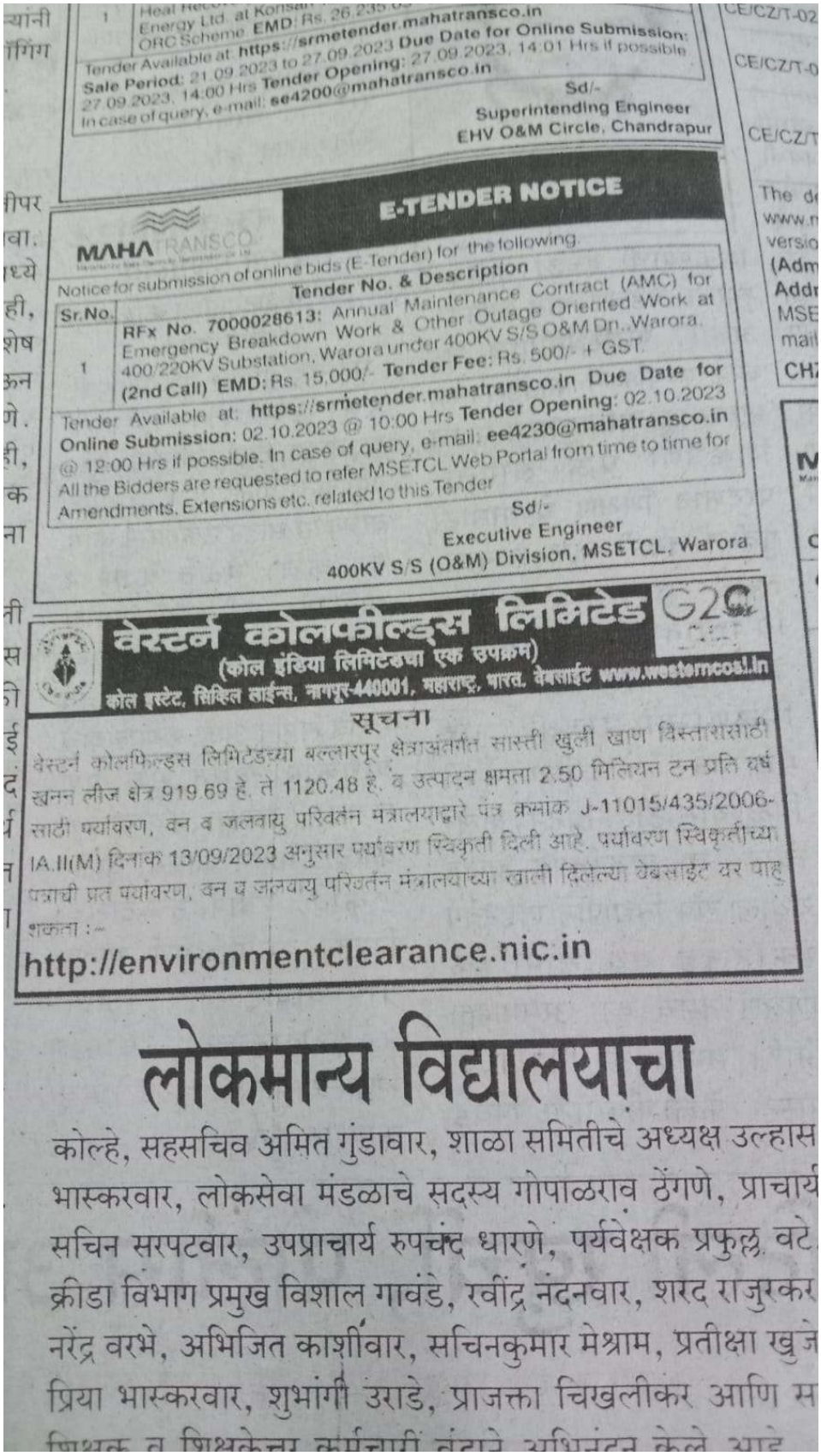

Energy Ltd. at Konsari
ORC Scheme. **EMD:** Rs. 26,235/-
Tender Available at **https://srmetender.mahatransco.in** **Due Date for Online Submission:**
Sale Period: 21.09.2023 to 27.09.2023 **Tender Opening:** 27.09.2023, 14:01 Hrs if possible
27.09.2023, 14:00 Hrs
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MAHA TRANSCO

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Sr.No.	Tender No. & Description
1	**RFx No. 7000028613:** Annual Maintenance Contract (AMC) for Emergency Breakdown Work & Other Outage Oriented Work at 400/220KV Substation, Warora under 400KV S/S O&M Dn., Warora. **(2nd Call) EMD:** Rs. 15,000/- **Tender Fee:** Rs. 500/- + GST

Tender Available at: **https://srmetender.mahatransco.in** **Due Date for Online Submission:** 02.10.2023 @ 10:00 Hrs **Tender Opening:** 02.10.2023 @ 12:00 Hrs if possible. In case of query, e-mail: **ee4230@mahatransco.in**
All the Bidders are requested to refer MSETCL Web Portal from time to time for Amendments, Extensions etc. related to this Tender

Sd/-
Executive Engineer
400KV S/S (O&M) Division, MSETCL, Warora

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सूचना

वेस्टर्न कोलफिल्ड्स लिमिटेडच्या बल्लारपूर क्षेत्राअंतर्गत सास्ती खुली खाण विस्तारासाठी खनन लीज क्षेत्र 919.69 हे. ते 1120.48 हे. व उत्पादन क्षमता 2.50 मिलियन टन प्रति वर्ष साठी पर्यावरण, वन व जलवायु परिवर्तन मंत्रालयाद्वारे पत्र क्रमांक J-11015/435/2006-IA.II(M) दिनांक 13/09/2023 अनुसार पर्यावरण स्विकृती दिली आहे. पर्यावरण स्विकृतीच्या प्रतीची प्रत पर्यावरण, वन व जलवायु परिवर्तन मंत्रालयाच्या खाली दिलेल्या वेबसाइट वर पाहु शकता :-

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लोकमान्य विद्यालयाचा

कोल्हे, सहसचिव अमित गुंडावार, शाळा समितीचे अध्यक्ष उल्हास भास्करवार, लोकसेवा मंडळाचे सदस्य गोपाळराव ठेंगणे, प्राचार्य सचिन सरपटवार, उपप्राचार्य रुपचंद धारणे, पर्यवेक्षक प्रफुल्ल वटे, क्रीडा विभाग प्रमुख विशाल गावंडे, रवींद्र नंदनवार, शरद राजुरकर, नरेंद्र वरभे, अभिजित काशीवार, सचिनकुमार मेश्राम, प्रतीक्षा खुजे, प्रिया भास्करवार, शुभांगी उराडे, प्राजक्ता चिखलीकर आणि स

Final Report

on

Comprehensive Hydraulic And Drainage Study of Catchment Area To Assess The Impact on The Wardha River As Per EC Condition Of Expansion of Sasti OCP Mine of Ballarpur Area, Western Coalfields Limited

Department of Civil Engineering

Indian Institute of Technology Kharagpur

Kharagpur-721302, India

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EXECUTIVE SUMMARY

The Ballarpur Sasti Mine, located in Maharashtra, operates within a hydrologically complex region, where numerous small streams or nallahs converge into the larger Wardha River system. These nallahs play a critical role in managing surface runoff and mitigating flood risks, particularly during monsoon seasons characterized by high rainfall. This study focuses on the diversion of two major nallahs—Gouri Nallah and Dhoptala Nallah—to ensure sustainable water management and protect mining operations and nearby communities. Advanced methodologies, including hydrologic and hydraulic modeling, were utilized to design these diversions and analyze their impact on flooding and the surrounding environment.

Hydrologic modeling played a crucial role in understanding the flow dynamics and calibrating the designs of the nallah diversions. The HEC-HMS model was employed in a distributed configuration, using a ModClark gridded transform method to simulate rainfall-runoff processes. Input data included daily rainfall and temperature records from the India Meteorological Department, along with Digital Elevation Models (DEM) derived from NASA's SRTM mission.

The modeling identified that approximately 89% of the annual precipitation occurred during the monsoon months (June to September), with peak rainfall contributing significantly to runoff in the catchment area. Simulations highlighted critical flow points at various outlets, including the Designed Discharge outlet and Gouri Nallah, ensuring that diversion designs could handle extreme weather events. By integrating distributed modeling with high-resolution DEMs, the analysis captured spatial variability across the basin, offering reliable predictions for flood management.

Flood frequency analysis was conducted using Gumbel's method to evaluate the probability of extreme flood events and determine the return periods for peak discharges in both Gouri and Dhoptala Nallahs. The analysis revealed that the 50-year return period flood for Gouri Nallah was 1400 m^3/s, aligning with its design capacity. Similarly, Dhoptala Nallah's design accounted for its 100-year return period flood of 550 m^3/s. This alignment between the design specifications and flood frequency estimates ensured that the diversions could safely manage discharges from extreme rainfall events without inundating surrounding areas.

The Gouri Nallah diversion was developed in two sections to handle varying discharges efficiently. The first section, extending from chainage 0 to 1800 m, was designed with a bottom

width of 60 m, a depth of 7 m, and a discharge capacity of 716 m^3/s. In contrast, the second section, covering chainage 1801 to 12000 m, was wider and deeper, with a bottom width of 80 m, a depth of 8.5 m, and a discharge capacity of 1400 m^3/s. Both sections were constructed with a side slope of 1:1.5 to ensure stability and minimize erosion. The design prioritized subcritical flow conditions, ensuring that floodwaters could be managed effectively without causing overflow near the Wardha River.

Similarly, the Dhoptala Nallah diversion was designed as a trapezoidal channel with a bottom width of 40 m, a depth of 5 m, and a top width of 55 m. The channel had a discharge capacity of 550 m^3/s, with a gentle slope of 1/2500 and a Manning's roughness coefficient of 0.02. This design ensured smooth and efficient water flow, preventing sediment accumulation and structural degradation.

The diversions of Gouri and Dhoptala Nallahs had a significant impact on the hydrology and flood dynamics of the region. The Gouri Nallah diversion successfully confined floodwaters to areas near the Wardha River, reducing flood risks for nearby villages such as Gouri. Observations post-diversion indicated no major inundation during peak monsoon discharges, demonstrating the efficacy of the design. Similarly, the Dhoptala Nallah diversion effectively managed the combined flow from Shivalan and Dhoptala Nallahs, preventing backwater effects and safeguarding downstream communities like Dhoptala village. However, with the designed sections of Gauri Nallha and Dhoptala Nallha were able to manage the carrying any advese discharge without causing the flood near the diversions.

The nallahs surrounding the proposed coal mine expansion support a rich diversity of flora and fauna, including various bird and mammal species. These watercourses are critical habitats for feeding, breeding, and roosting, as confirmed by surveys conducted during monsoon and post-monsoon periods. The planned diversions of the nallahs may cause temporary disruptions to wildlife, particularly migratory species, due to changes in water flow and availability. Short-term impacts include alterations to habitat quality and behaviors such as roosting and feeding, as well as potential challenges for herbivores relying on these water sources during dry seasons, however, no significant long-term effects are expected, although they should be taken into account (like roosting, breeding, and feeding behavior of birds).

Specifically, the Gouri Nallah diversion may affect agricultural productivity in areas that rely on nallah water for irrigation and cause temporary submergence during monsoons, though long-term effects on local ecosystems and bird behavior are expected to be minimal. Similarly, the Dhoptala Nallah diversion poses risks of submergence and potential changes in crop yields. While these diversions may lead to short-term ecological and agricultural disruptions, the affected ecosystems are likely to stabilize over time, minimizing long-term impacts on the region.

CHAPTER 1: INTRODUCTION

1.1 Introduction

The Sasti OC (Open Cast) mine is currently in operation under the management of Western Coalfield Limited. The site is situated in close proximity to Sasti village within the Rajura tehsil of the Chandrapur district in the state of Maharashtra. The mine began operating in the 1985-86 period, with coal production commencing in 1986-87. Following the enactment of the Environment (Protection) Act in 1986, clearance was obtained from the Ministry of Environment, Forest and Climate Change (MoEF&CC) for a production capacity of 1.0 million tonnes per annum (MTPA). This clearance was granted in a letter dated 3rd April, 1989, with reference number J11015/24/88-IA. The approval for expanding the production capacity from 1.0 million tonnes per annum (MTPA) to 1.60 MTPA was acquired in 2005 in accordance with the Environmental Impact Assessment (EIA) Notification of 1994. In 2007, the production capacity was increased from 1.60 million tonnes per annum (MTPA) to 2.50 MTPA, in accordance with the Environmental Impact Assessment (EIA) Notification of 2006. At present the mine is operating with the Environmental Clearance granted by MoEF&CC vide ref no. J-11015/435/2006-IA.II (M) in May, 2007 for 2.50 MTPA production capacity within land area of 919.69 ha.

The coal reserves are expected to be depleted in the current mine. In order to meet the country's coal demand, it is imperative to sustain production from the current mine, taking into account its techno-economic feasibility. The coal reserves are located in the lower side of the project. The expansion proposal determined that extracting coal up to a depth of 200 meters is both technologically and economically viable. One significant benefit of continuing production from the current mines is the presence of a previous mine void that can be used for dumping overburden. This greatly decreases the need for additional land to be used for external dumping. The backfilling in the project, for which environmental clearance was granted in 2007, was only 29.72%. However, in the current proposal, the careful and detailed project planning has resulted in a 93% completion of backfilling. Through the implementation of sequential planning, a total area of over 350 hectares of land is being preserved and protected from degradation caused by external overburden. Furthermore, this project is not hindered by any significant limitations, such as the need for forest land or the requirement for village rehabilitation.

With the recognition of human capital as the most crucial asset for the transformation of the company, WCL is now focused on achieving even greater success in the current fiscal year and

beyond, after achieving its highest ever coal production and dispatch in 2017-18. The mission of WCL.2.0 is to create a strong and sustainable system for both physical and financial stability through a collaborative effort of all employees. The objective is to determine the optimal alternative by engaging in collective deliberation and taking ownership of the decision-making process for its execution. The exercise has been comprehensive, encompassing all aspects ranging from productivity to quality of life to public perception of the organization.

Western Coalfields Limited (WCL) is expanding its mining operations, necessitating significant alterations to the local hydrology. This project involves a comprehensive hydraulic and drainage study of the catchment area, focusing on the diversion of several Nallahs—Shivlam Nallah, Dhoptala Nallah, Chincholi Nallah, Gouri Nallah, Sakhari Nallah, and Matra Nallah (as shown in Figure 1)—into an artificial canal (as shown in Figure 2). The objective is to assess the flood impact and develop a detailed design for the proposed diversions, ensuring effective flood management and minimal disruption to the local ecosystem. This study will utilize HEC-HMS for hydrologic modeling and HEC-RAS for hydraulic modeling to simulate flood scenarios and evaluate the effectiveness of the diversion strategies.

1.2 Background of the study

The Ballarpur Sasti Mine, located in Maharashtra, is a significant open-cast mining operation in the region. The site is situated at geographical coordinates 19°49'8.45"N and 79°18'56.43"E, near the town of Ballarpur. The mine's drainage system is primarily influenced by several small watercourses or *nallahs* that interact with the larger Wardha River, a key hydrological feature in this area. Figure 1.1 shows the natural drainage network of the OC Sasti mine. The primary nallahs involved in the drainage system near the Sasti Mine include: Detail map of study area is also given in Annexure 1.

1. **Sakhari Nallah**
2. **Pouni Nallah**
3. **Chincholi Nallah**
4. **Gouri Nallah**
5. **Dhoptala Nallah**

6. **Shivalan Nallah**
7. **Rajuara Nallah**

These nallahs collectively contribute to the hydrological complexity of the region, with their discharges influencing both local water management and the overall flow into the Wardha River. This study focuses on understanding the flood impact in this region, particularly in relation to two critical diversions that alter the natural course of these nallahs:

- **Diversion 1:** This diversion occurs near Gouri Nallah, where the flood discharges of Sakhari Nallah, Pouni Nallah, and Chincholi Nallah converge. The combined flow is directed into Gouri Nallah, which then channels this water to the Wardha River downstream at coordinates 19°49'50.58"N, 79°20'9.21"E.
- **Diversion 2:** Located near Dhoptala Nallah, this diversion merges the flows of Shivalan Nallah and Dhoptala Nallah near Dhoptala Village. The combined discharge is then directed into the Wardha River at coordinates 19°49'11.60"N, 79°21'10.71"E.

The objective of this study is to assess the impact of these natural and artificial watercourses on the flood dynamics within the area, especially during periods of heavy rainfall. The analysis will consider the potential for flooding, the effectiveness of the diversions, and the broader implications for the Wardha River's floodplain, which is crucial for the safety of both the mining operation and the surrounding communities.

1.3 Objectives of the Study

Comprehensive hydraulic and drainage study of catchment area to assess the impact on the Wardha river, Study Focuses on the following objectives.

1. To delineate catchment area of Ballarpur Area, WCL.
2. To demarcate existing river and Nallah in and around the project area.
3. To carry out detailed topographic survey by using Total station/ DGPS/ Drone along the existing and proposed nallah including taking L- Section and cross sections as per requirement.
4. To prepare the Nallah drawings i.e. plan and profile using Autocad of required scale showing all topographical features, basic information of the project and design details etc.
5. To collect and carry out analysis of data for nallah i.e. nallah details, topographic sheets, yearly rainfall data, H.F.L. Controlling levels etc., and preparation of hydrological report.

6. To carry out Geotechnical Investigation.
7. To analysis and access the impact on Wardha River due to diversion of nallahs at Ballarpur area.
8. To provide basic details regarding diversion of Nallah's in the mine expansion area viz Shivlam nallah, Dhoptala nallah, Chincholi nallah, Gouri nallah, Sakhari nallah and Matra nallah etc.
9. To assess the impact on aquatic flora and fauna in the near by area of Sasti OC project due to diversion of Wardha River.
10. Conclusion and Recommendations on proposed surface mining in Ballarpur area.

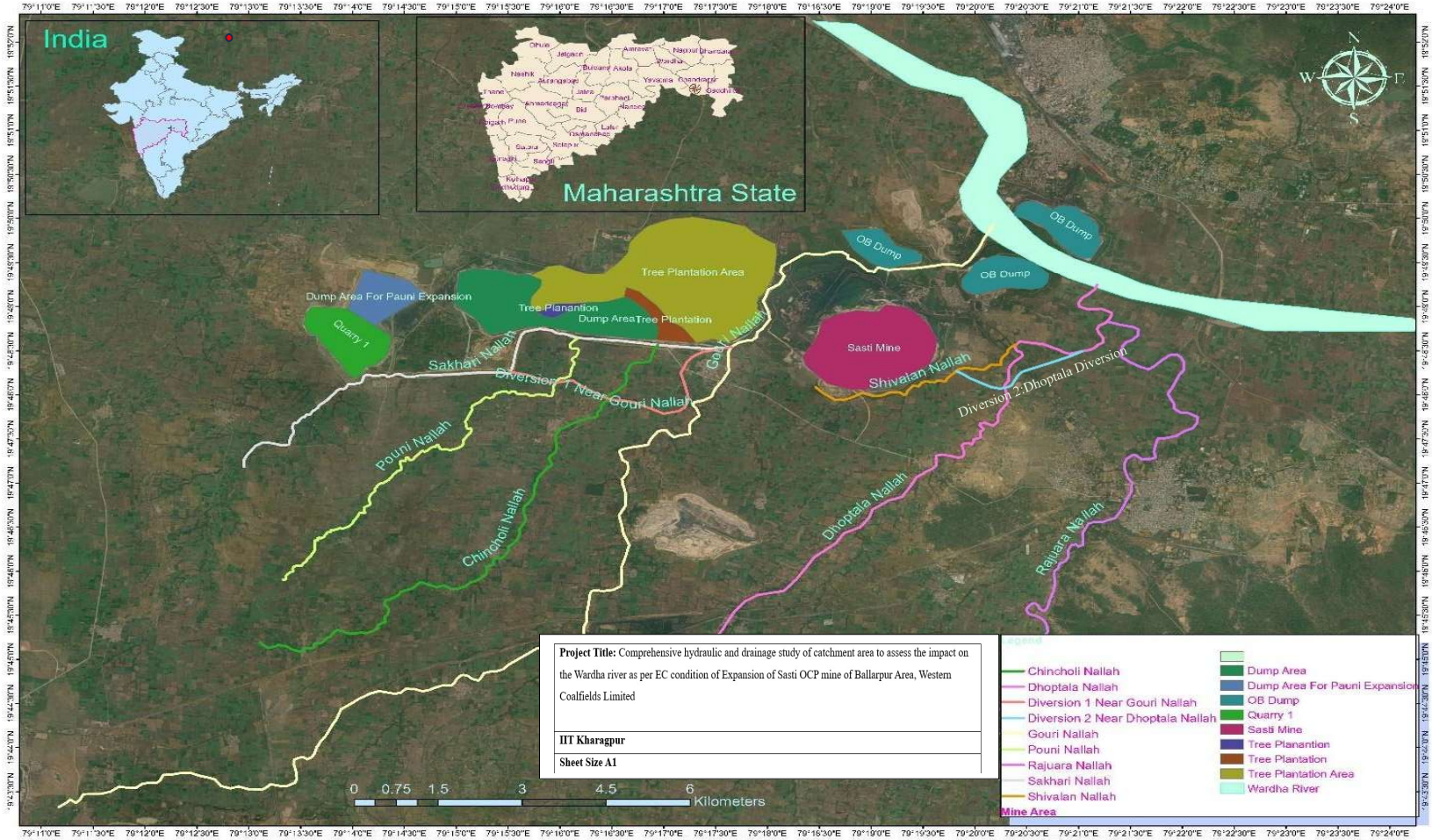


Figure 1. 1 Drainage network of OC Sasti mine

CHAPTER 2: STUDY AREA AND DATA COLLECTION

2.1 Description of Study Area

The study area is located in Chandrapur district of Maharashtra, with latitude ranging from 19°48'00" to 19°56'00" N, and longitude ranging from 79°14'00" to 79°23'00" E. The location can be identified on toposheet number 56 M/5 (Figure 2.1) and layout of the study area is as shown in Figure 2.2. The study area exhibits a flat topography, characterized by the presence of alluvial deposits on both banks of the Wardha River (Singh and Chandra 1983) . The presence of sub-dendritic drainage indicates the presence of sedimentary terrain (see figure 2.2). The study area is a sub-basin within the Godavari valley, which is part of the Gondwana basin. It is situated on the eastern side of an anticline that slopes towards the NNW direction [Sarate (2017)]. The Archean rocks consist primarily of quartzites, granite gneisses, and other similar types of rocks (Ganvir and Guhey (2020)). The Gondwana rocks in the Kamthi Formation commonly exhibit ferruginous red-brown sandstone and variegated shale. These are found below the Barakar Formation, which is characterized by the presence of grey to white sandstone (Ganvir and Guhey (2020)). The Wardha Valley contains a single primary coal seam, also referred to as the Principal coal seam. This seam is found within the Barakar Formation, which has a high ash content. The Talchir formation, consisting of various types of shale and sandstone, is the lowest layer in the sequence (Ganvir and Guhey (2020)).

2.2 Drainage Network of the Study Area Near Ballarpur Sasti Mine, Maharashtra

The drainage network in the area surrounding the Ballarpur Sasti Mine is a critical component of the region’s hydrological system, consisting of several key nallahs or small streams that collectively regulate surface water flow. These natural channels play a pivotal role in managing surface runoff, especially during the monsoon season when the region experiences heavy rainfall and an elevated risk of flooding. The network helps in reducing waterlogging, ensuring proper drainage, and supporting the ecological balance in the area. The region's drainage system exhibits a complex interplay between natural watercourses and human modifications. Natural streams have evolved over time to adapt to the area's topography and climatic conditions, shaping the landscape and influencing local ecosystems. Meanwhile, human interventions, such as mining activities, infrastructure development, and land-use changes, have altered certain sections of the drainage

network. These modifications may include redirected watercourses, embankments, and artificial channels designed to manage water flow more effectively in light of industrial activities.

2.2.1 Key Nallahs and Their Roles

1. **Sakhari Nallah:** This stream originates in the southwestern part of the study area and flows towards the northeast, where it converges with other streams near the first diversion point close to Gouri Nallah.
2. **Pouni Nallah:** Flowing parallel to Sakhari Nallah, Pouni Nallah also heads northeast and contributes to the drainage system by joining with Chincholi Nallah before their combined flow moves towards Gouri Nallah.
3. **Chincholi Nallah:** Situated further south, Chincholi Nallah follows a similar path towards the northeast and merges with Pouni Nallah, eventually joining Gouri Nallah near the first diversion.
4. **Gouri Nallah:** This stream serves as a crucial conduit for the combined discharges from Sakhari, Pouni, and Chincholi Nallahs. After the first diversion, Gouri Nallah carries these waters further northeast, ultimately discharging into the Wardha River at coordinates 19°49'50.58"N, 79°20'9.21"E.
5. **Dhoptala Nallah:** Flowing in the southeastern part of the study area, Dhoptala Nallah meets Shivalan Nallah near Dhoptala Village, where the second diversion occurs. This combined flow is then directed towards the Wardha River.
6. **Shivalan Nallah:** Originating close to the southeastern boundary of the study area, Shivalan Nallah merges with Dhoptala Nallah at the second diversion point. The combined stream continues towards the northeast, discharging into the Wardha River at coordinates 19°49'11.60"N, 79°21'10.71"E.
7. **Rajuara Nallah:** Positioned in the southeastern extremity, this nallah follows a meandering path towards the northeast and contributes to the overall drainage of the area by merging into the network closer to the Wardha River.
8. Wardha River is a significant tributary of the Godavari River as shown in Figure 2.3, flowing through the central Indian state of Maharashtra. It plays a crucial role in the region's agriculture, industry, and ecology. The Wardha River, flowing to the north and northeast of the study area, serves as the ultimate discharge point for the combined flows

from these nallahs. The river's proximity to the mine and associated drainage network is crucial for managing flood risks. Both diversions ensure that water from the various nallahs is channeled efficiently into the Wardha River, thereby mitigating the potential for flooding in the surrounding areas.

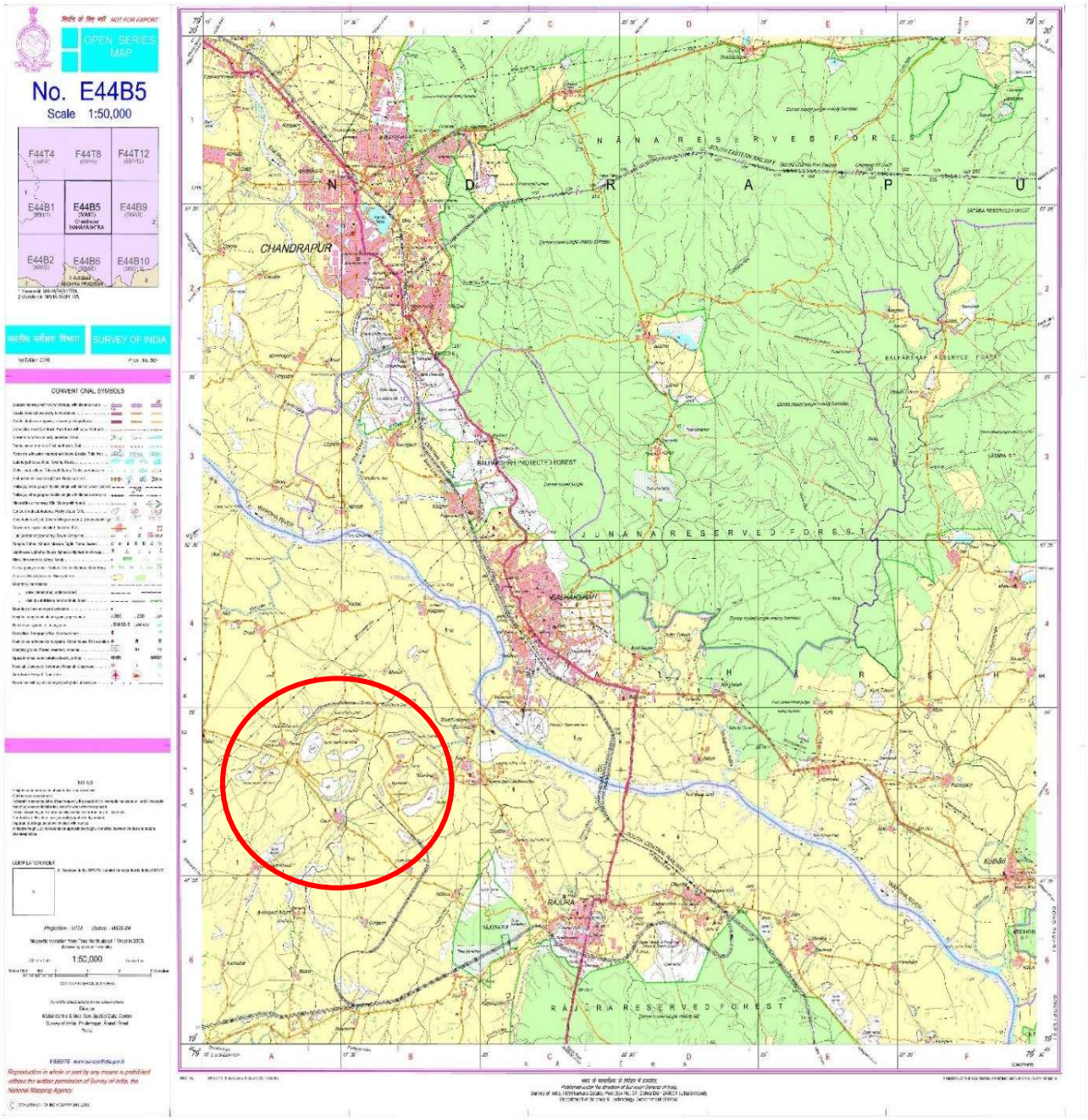


Figure 2. 1 Toposheet showing Sasti Mine Location as well as other important features (56M/5)

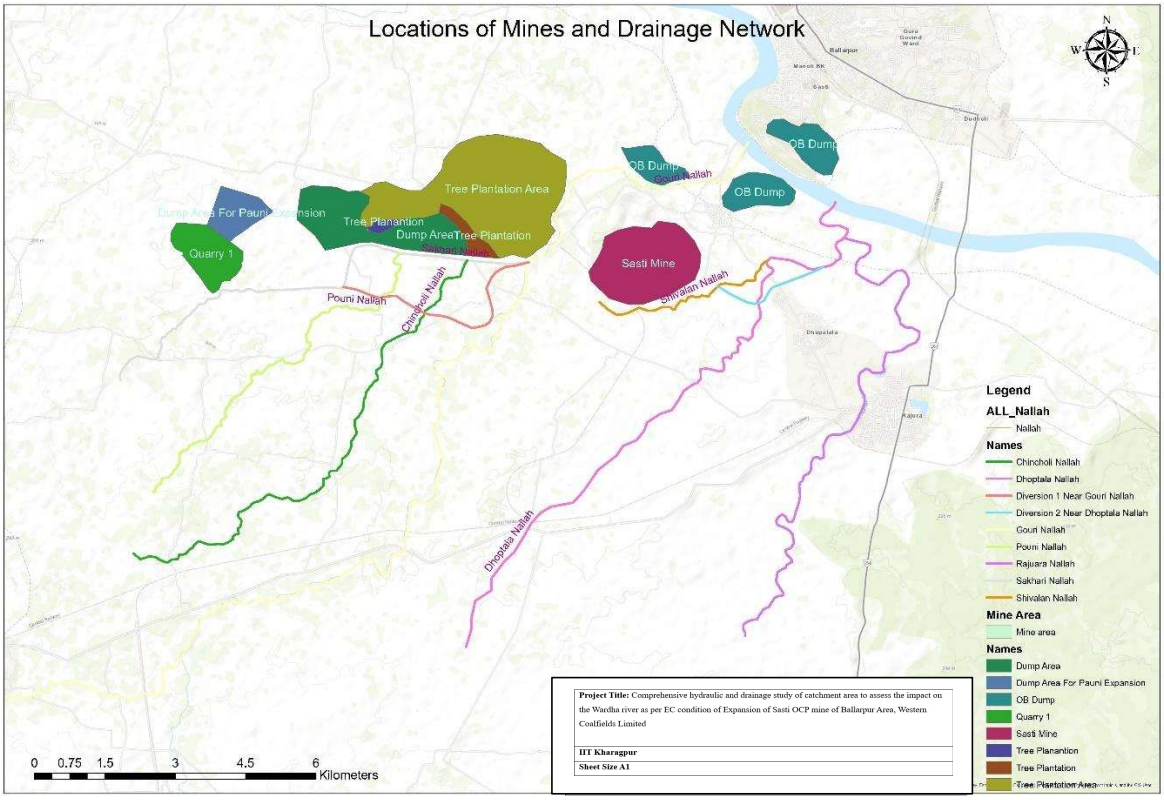


Figure 2. 2 Figure showing location of mine area and drainage network

2.3 Data Collection

To comprehensively assess the flood impact and hydrological dynamics of the Wardha River and its associated nallahs near the Ballarpur Sasti Mine, a variety of datasets were collected using different methodologies and sources. These datasets were crucial in understanding the topography, hydrology, land use, and rainfall patterns of the study area. Below Table 2.1 is a summary of the data collection efforts:

1. **Drone and DGPS Survey:** The survey was carried out to gather precise topographical data along the diversion areas near the Gouri Nallah and Dhoptala Nallah. This information is essential for understanding the exact levels and gradients, which are critical for predicting how water will flow through the diversions during flood events. The drone provides high-resolution aerial imagery, while DGPS ensures that the elevation data is accurate, which is key for designing flood mitigation structures.

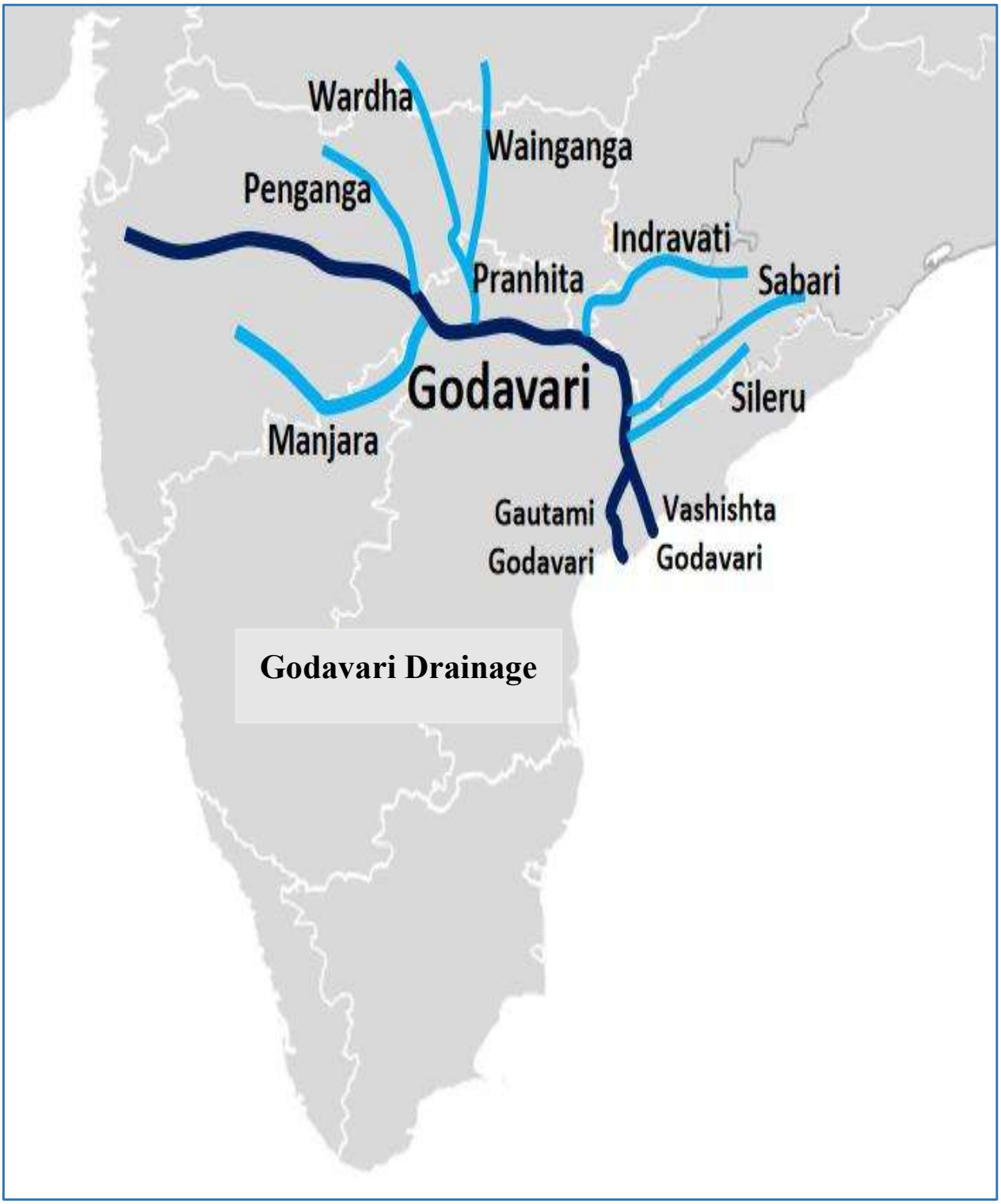


Figure 2. 3 Drainage Network of Godawari River including Wardha Tributary

Table 2. 1 Data Collection Source

Data Type	Source	Purpose
Drone and DGPS Survey	Field Survey	To obtain accurate elevation levels along the diversions.
Basin Delineation (DEM)	EarthExplorer, Cartosat DEM	For watershed and basin delineation, topographic analysis.
Rainfall Data	IMD (India Meteorological Department)	To assess rainfall patterns and its impact on flood risk.
LULC (Land Use/Land Cover)	Bhunidhi	To determine land use patterns and their impact on runoff.
Discharge Data	India-WRIS	To analyze river discharge patterns and flow dynamics.

2. **DEM:** Basin delineation is the process of defining the boundaries of a watershed or catchment area. The Cartosat DEM data was used to delineate the catchment area contributing to the Wardha River. This data allows for a detailed analysis of the terrain, helping to identify how water will flow through the landscape and where it will accumulate, which is crucial for flood risk assessment.

3. **Rainfall Data from IMD:** Rainfall is a primary driver of flooding. The rainfall data from IMD, with its fine 25-meter grid resolution, for 1950 to 2020 years data was collected. provides detailed spatial and temporal patterns of rainfall across the study area. This data is used to simulate how different rainfall events will impact the hydrology of the region, particularly in terms of runoff generation and peak flows in the river and nallahs. Yearly Rainfall Data is given in Annexure 2.

4. **DEM:** Basin delineation is the process of defining the boundaries of a watershed or catchment area. The Cartosat DEM data was used to delineate the catchment area contributing to the Wardha River. This data allows for a detailed analysis of the terrain, helping to identify how water will flow through the landscape and where it will accumulate, which is crucial for flood risk assessment.

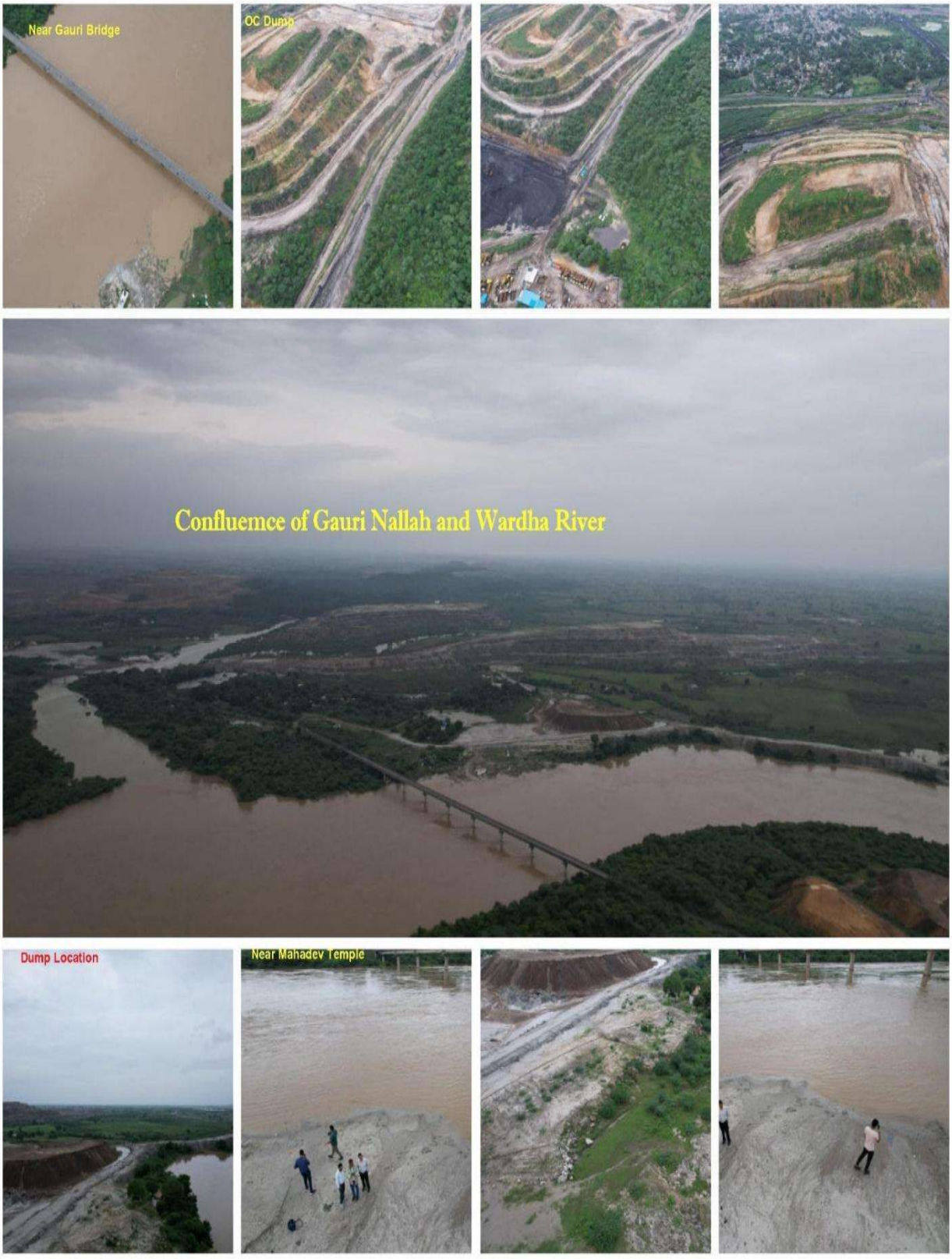


Figure 2. 4 Site Visit Photos Near Gauri Nallah

Figure 2. 5 Site Visit Photos Near Dhoptala Village

5. **Discharge Data from India-WRIS:** Discharge data provides historical records of how much water has flowed through the Wardha River and its tributaries over time. This data is essential for understanding the natural flow regimes, calibrating hydrological models, and validating the results of simulations. It also helps in assessing the potential impact of future flood events based on past discharge records. Yearly Average discharge data is given in Annexure 3.

6. **LULC Data from Bhunidhi:** The land use and land cover data provide insights into how the land is being used in the study area. Different land covers, such as forests, agricultural fields, urban areas, and mining zones, have different impacts on how water is absorbed or runs off the surface. This data helps in assessing the current state of the landscape and in predicting how changes in land use might influence flood risk. Detail map of LULC is given in Annexure 4.

CHAPTER 3: METHEDOLOGY

3.1 Background

The methodology outlined in this report is meticulously designed to address the hydrological and environmental challenges posed by the drainage system near the Ballarpur Sasti Mine, Maharashtra. The study area, characterized by a network of nallahs—Sakhari Nallah, Pouni Nallah, Chincholi Nallah, Gouri Nallah, Dhoptala Nallah, Shivalan Nallah, and Rajuara Nallah—along with two key diversions near Gouri and Dhoptala Nallahs, plays a critical role in managing surface water flow into the Wardha River. Given the complex interaction between these nallahs and the surrounding topography, this study employs a comprehensive methodology that integrates advanced data collection techniques, including topographic surveys and GIS-based analysis, with sophisticated hydrologic and hydraulic modeling. The primary objective is to accurately delineate the catchment areas, assess the flow dynamics within the nallahs, and design effective diversion structures that mitigate flood risks while ensuring the sustainable management of water resources in the region.

By adopting state-of-the-art tools such as HEC-HMS for hydrologic modeling and HEC-RAS for hydraulic analysis, the methodology facilitates a thorough understanding of the catchment's behavior under varying hydrological conditions. This approach not only aids in the identification of potential flood zones and the impact of existing diversions but also informs the design of new diversion structures that are both efficient and environmentally sound. The ensuing sections of the report detail the specific steps undertaken in this methodology, underscoring the rigorous and systematic approach adopted to address the hydrological complexities of the study area.

3.2 Methods and Materials

The methodology as shown in Figure 3.2 for studying and designing nallah diversions near the Ballarpur Sasti Mine begins with data collection, which serves as the foundation for the entire project. This involves gathering a variety of data, including topographic surveys, GIS and remote sensing data, soil samples, as well as rainfall and discharge records. The topographic survey provides detailed information about the elevation and contours of the study area, which is crucial for understanding the flow of water and the natural drainage patterns.

Simultaneously, GIS and remote sensing data are used to analyze land use and land cover (LULC), and to generate Digital Elevation Models (DEMs). These datasets help in the delineation of the catchment area, mapping the stream network, and understanding the spatial distribution of different land cover types. Soil samples are collected and analyzed to determine the physical and geotechnical properties of the soil, which are essential for assessing the stability of the nallah banks and for the design of the diversions.

Rainfall and discharge data, collected from relevant sources, provide insights into the hydrological behavior of the area, including peak flow rates and the frequency of flooding events. With this data in hand, the next step involves the preparation of nallah profiles and the demarcation of rivers and nallahs within the catchment area. This step is crucial for identifying the natural drainage channels and understanding how they interact with the surrounding topography and land use.

Following this, hydrologic modeling is carried out using HEC-HMS software to simulate the response of the catchment area to different rainfall events. This modeling helps predict how water will flow through the nallahs under various scenarios. Subsequently, hydraulic modeling is conducted using HEC-RAS software to analyze the flow characteristics within the nallahs and to design appropriate structures to manage the water flow.

Impact assessment is a crucial process used to evaluate the potential effects of proposed interventions, such as the diversion of nallahs, on both the local environment and downstream areas. This comprehensive evaluation encompasses a variety of environmental factors to understand the full scope of potential changes and risks associated with the proposed diversions. One of the primary components of this assessment is the evaluation of changes in flood risk. The impact of the nallah diversions on the frequency, magnitude, and extent of flooding in both the immediate vicinity and the downstream regions is carefully analyzed. This helps identify areas that may experience an increased risk of flooding due to altered flow patterns, as well as areas where flood risk may be mitigated or reduced.

In addition to flood risk, the assessment also focuses on potential impacts on water quality. Changes in the flow dynamics of the nallahs may affect sediment transport, nutrient levels, and the overall health of aquatic ecosystems. These factors are crucial in understanding how the diversions may influence water quality, both in the diverted nallahs and in the receiving water bodies, such as the Wardha River.

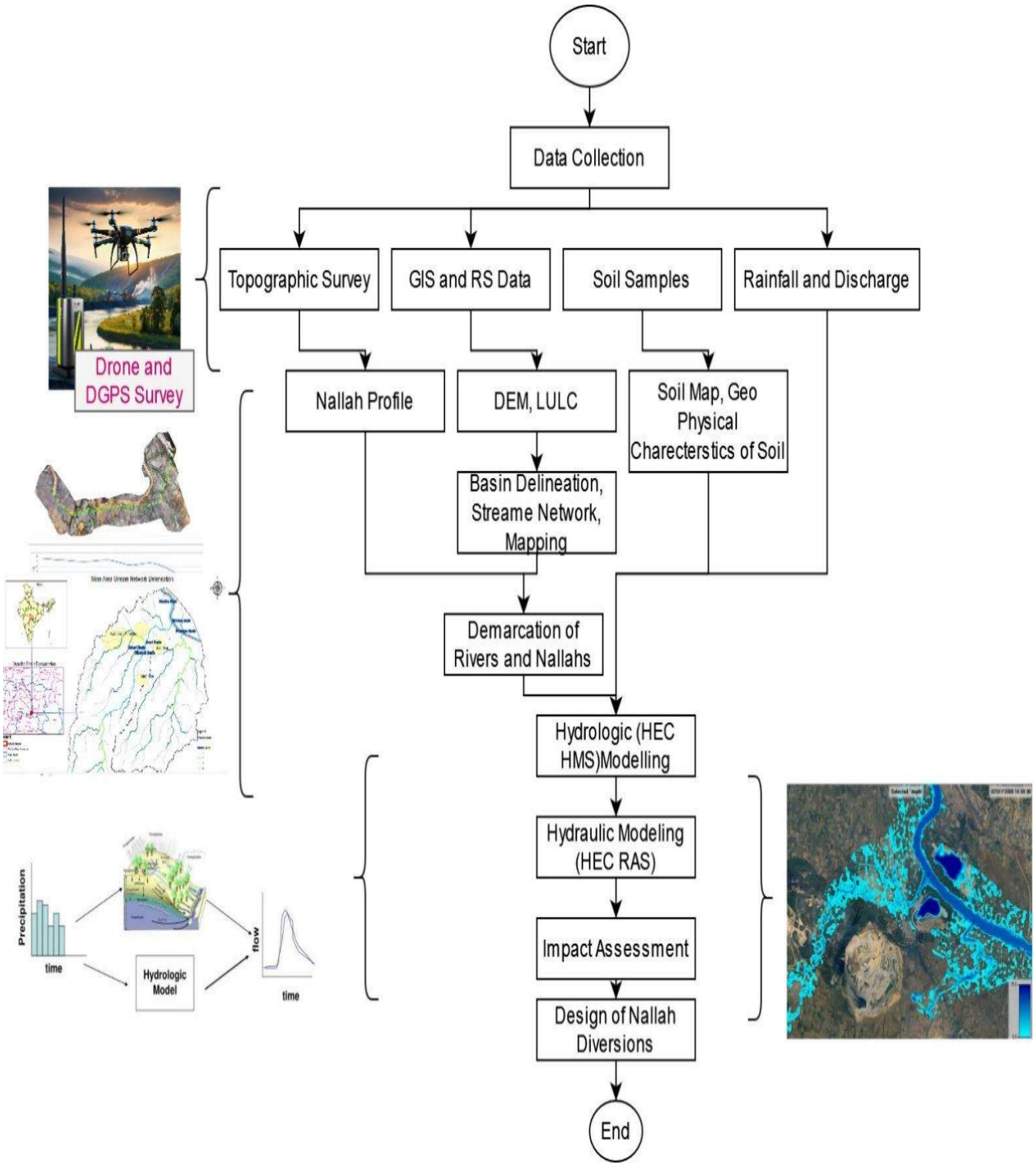


Figure 3. 1 Detailed Methodology.

CHAPTER 4: SURVEY AND INVESTIGATIONS

4.1 Surveying using Drone and DGPS

The Drone and DGPS survey played a crucial role in accurately mapping the topography and elevation profiles along the two key diversions near the Ballarpur Sasti Mine. For **Diversion 1**, a comprehensive survey was conducted over a stretch of 12 kilometers. Utilizing advanced drone technology, high-resolution aerial images were captured, providing detailed surface information. To ensure the precision of these aerial measurements, Differential GPS (DGPS) Ground Control Points (GCPs) were established at every 100-meter interval along the entire length of the diversion. These GCPs served as reference points, allowing for the accurate georeferencing of the drone imagery and ensuring that the elevation data obtained was both reliable and highly accurate. Similarly, **Diversion 2** was surveyed over a 4-kilometer stretch, following the same rigorous methodology. Drone imagery combined with DGPS GCPs, spaced at 100-meter intervals, enabled the creation of a precise and detailed elevation profile for this diversion as well.

The data collected from these surveys was used to generate elevation profiles along the paths of both diversions, which are critical for understanding the topographical variations and for designing effective water management strategies. These elevation profiles provide insights into the gradients and potential flow paths, helping to identify areas where water may accumulate or where additional engineering measures may be required.

4.2 DGPS Survey

The Differential GPS (DGPS) survey conducted for this project was meticulously planned and executed to ensure high accuracy in mapping the topographical features along the proposed diversions near the Ballarpur Sasti Mine. The DGPS survey was critical for establishing precise ground control points (GCPs), which were used to enhance the accuracy of the drone imagery and to develop detailed elevation profiles.

4.2.1 Survey Process:

Survey Planning: The survey began with careful planning, where the paths of the two diversions were mapped out based on the project's requirements. The first diversion, spanning 12 kilometers,

and the second, covering 4 kilometers, were identified as key areas for detailed topographical analysis.

Establishing Ground Control Points (GCPs): GCPs were established along the length of both diversions at 100-meter intervals. These GCPs are critical reference points on the ground, which are accurately located using DGPS technology. The location of each GCP was carefully chosen to cover all significant topographical variations along the survey path.

DGPS Equipment Setup: High-precision DGPS equipment was set up at each GCP location. The DGPS system typically involves two GPS units: a base station and a rover. The base station was placed at a known, fixed location, while the rover unit was moved to each GCP point. The base station continuously receives satellite signals and broadcasts correction data to the rover unit, which allows for real-time positioning accuracy within centimeters.

Data Collection: At each GCP, the rover unit recorded the exact latitude, longitude, and elevation data. This information was used to correct the positional data collected by the drone, ensuring that the aerial imagery was accurately georeferenced to the Earth's surface.

Quality Assurance: To ensure the reliability of the data, redundant measurements were taken at each GCP, and any inconsistencies were corrected in the field. Post-processing of the data further enhanced the accuracy by eliminating any residual errors caused by satellite signal disturbances or environmental factors.

Integration with Drone Survey: The accurate GCPs obtained from the DGPS survey were integrated with the drone imagery. This integration allowed for the generation of high-resolution, georeferenced elevation models and maps. The DGPS data ensured that the elevation profiles along the diversions were accurate and reflective of the actual ground conditions.

Elevation Profile Creation: Using the DGPS-corrected data, detailed elevation profiles were drawn along the survey paths of both diversions. These profiles, which are included in Annexure 1 of the report, provide essential information about the gradient and topographical features of the terrain, informing the design and planning of the nallah diversions.

Figure 4. 1 Pictures Depicting DGPS Points Surveying

4.3 Drone Survey

In the context of this project, a drone survey was conducted to acquire high-resolution aerial imagery along the two key diversions near the Ballarpur Sasti Mine. This survey was essential for generating detailed topographical maps and elevation profiles, which are critical for the design and assessment of the nallah diversions.

4.3.1 Drone Survey Details:

Flight Altitude and Ground Sampling Distance (GSD): The drone was flown at a height of 100 meters above ground level along both Diversion 1 and Diversion 2. At this altitude, the Ground Sampling Distance (GSD) was maintained at 5 centimeters. 80% overlap was maintained. GSD refers to the distance between two consecutive pixel centers measured on the ground. A GSD of 5 cm means that each pixel in the aerial imagery represents a 5 cm x 5 cm area on the ground, allowing for exceptionally detailed images that capture even small topographical features.

Survey Coverage:

Diversion 1: The drone survey covered a 12-kilometer stretch along the first diversion. The high-resolution imagery obtained provided a comprehensive view of the entire length of the diversion, capturing all relevant features such as changes in terrain, vegetation cover, and existing infrastructure.

Diversion 2: For the second diversion, the drone survey spanned a 4-kilometer length. Despite the shorter distance, the same level of detail was maintained, ensuring that no critical features were missed.

Aerial Image Acquisition: During the flight, the drone captured overlapping images that were later stitched together to create a continuous, seamless orthomosaic of the area. The high GSD ensured that the images were sharp and clear, with fine details like small changes in elevation, minor water channels, and other features that could influence the design of the diversions.

Integration with DGPS Data: The accuracy of the drone imagery was enhanced by integrating it with the Ground Control Points (GCPs) established during the DGPS survey. The GCPs provided precise georeferencing, ensuring that the drone images were accurately aligned with the real-world coordinates. This integration was crucial for producing reliable elevation profiles and for subsequent hydrological and hydraulic modeling.

Data Processing and Analysis: The high-resolution imagery was processed to generate detailed Digital Elevation Models (DEMs) and topographical maps. These models were used to analyze the elevation profiles along both diversions, identifying areas of concern such as potential flood zones, erosion-prone regions, and other features that could impact the flow of water during high discharge events.

Application in Project Planning: The detailed drone survey data provided a comprehensive understanding of the terrain along the diversions, allowing for informed decision-making in the

design of the nallah diversions. The high-resolution images also facilitated the identification of any existing man-made structures or natural obstacles that could influence the diversion paths.

Figure 4. 2 Pictures Depicting Flight Planning of Drone Survey

4.4 Processing of Drone and DGPS Survey

drone survey was conducted to acquire high-resolution aerial imagery along the two key diversions near the Ballarpur Sasti Mine. This survey was essential for generating detailed topographical maps and elevation profiles, which are critical for the design and assessment of the nallah diversions.

4.4.1 Drone Survey Details:

Flight Altitude and Ground Sampling Distance (GSD): The drone was flown at a height of 100 meters above ground level along both Diversion 1 and Diversion 2. At this altitude, the Ground Sampling Distance (GSD) was maintained at 5 centimeters. GSD refers to the distance between two consecutive pixel centers measured on the ground. A GSD of 5 cm means that each pixel in the aerial imagery represents a 5 cm x 5 cm area on the ground, allowing for exceptionally detailed images that capture even small topographical features.

Survey Coverage:

Diversions: The drone survey covered a 12-kilometer stretch along the first diversion. For the second diversion, the drone survey spanned a 4-kilometer length. The high-resolution imagery

obtained provided a comprehensive view of the entire length of the diversion, capturing all relevant features such as changes in terrain, vegetation cover, and existing infrastructure.

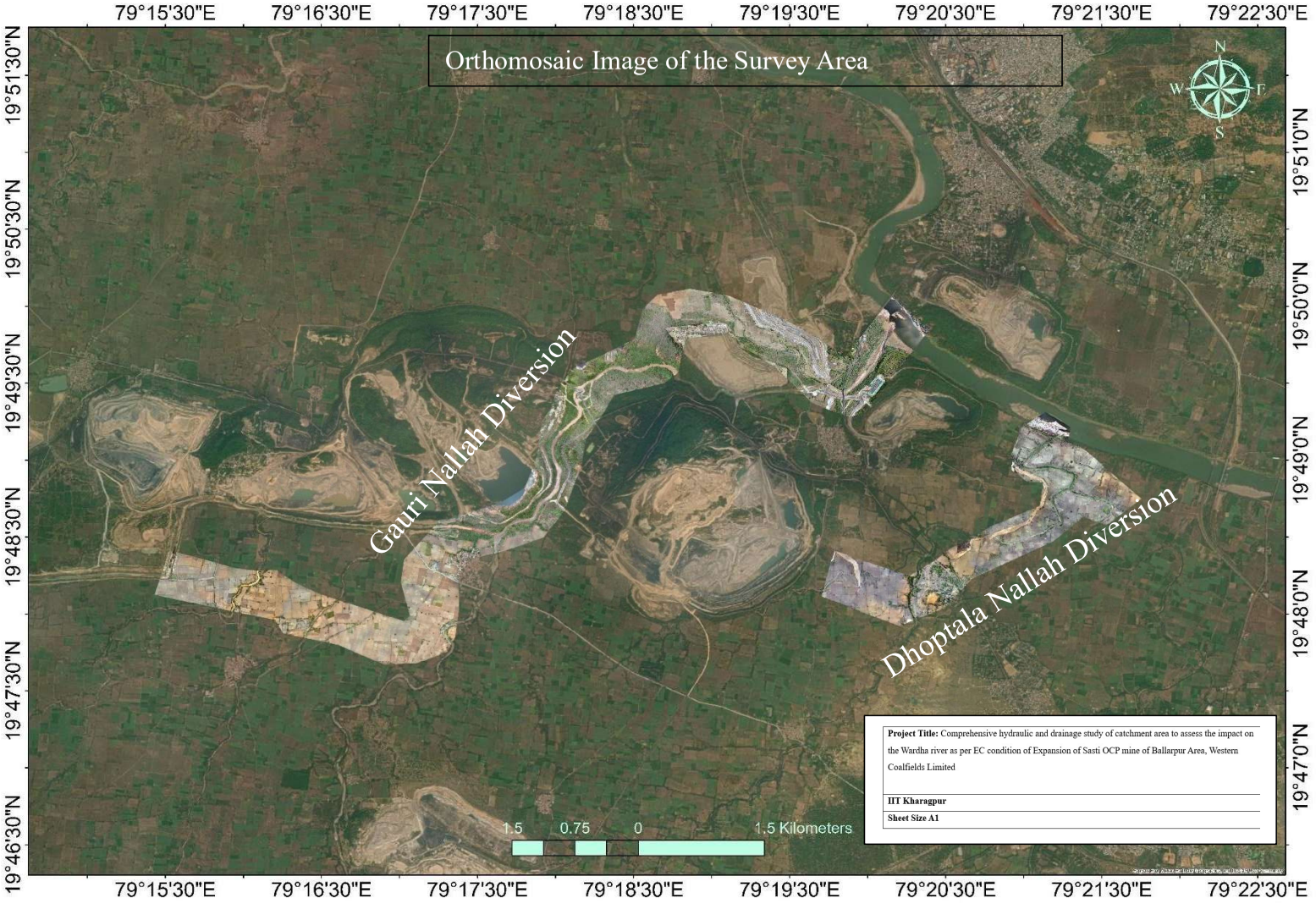


Figure 4. 3 Orthomosaic image of Mapped area of Diversions 1 and 2 by drone coverage

Aerial Image Acquisition: During the flight, the drone captured overlapping images that were later stitched together to create a continuous, seamless orthomosaic of the area as shown in Figure 3.3. The high GSD ensured that the images were sharp and clear, with fine details like small changes in elevation, minor water channels, and other features that could influence the design of the diversions.

Integration with DGPS Data: The accuracy of the drone imagery was enhanced by integrating it with the Ground Control Points (GC**Ps)** established during the DGPS survey. The GCPs provided precise georeferencing, ensuring that the drone images were accurately aligned with the real-world coordinates. This integration was crucial for producing reliable elevation profiles and for subsequent hydrological and hydraulic modeling.

Data Processing and Analysis: The high-resolution drone imagery captured during the survey of Diversion 1 and Diversion 2 was processed using Agisoft software. This powerful photogrammetry tool enabled the creation of detailed Digital Elevation Models (DEMs) and orthomosaic images. The captured images, which had a Ground Sampling Distance (GSD) of 5 centimeters, were first aligned and stitched together to form a continuous, seamless orthomosaic. This orthomosaic provided a highly accurate, georeferenced representation of the terrain along the 12-kilometer stretch of Diversion 1 and the 4-kilometer stretch of Diversion 2. The DEMs generated through Agisoft allowed for precise analysis of elevation profiles, critical for identifying areas prone to flooding or erosion and informing the design of the nallah diversions. high-resolution imagery was processed to generate detailed Digital Elevation Models (DEMs) and topographical maps. Figure 4.4 shows the developed DEM. These models were used to analyze the elevation profiles along both diversions, identifying areas of concern such as potential flood zones, erosion-prone regions, and other features that could impact the flow of water during high discharge events.

Application in Project Planning: The detailed drone survey data provided a comprehensive understanding of the terrain along the diversions, allowing for informed decision-making in the design of the nallah diversions. The high-resolution images also facilitated the identification of any existing man-made structures or natural obstacles that could influence the diversion paths. The integration of the drone data with Ground Control Points (GCPs) from the DGPS survey further ensured the accuracy of the models, making them a reliable basis for hydrological and hydraulic modeling in this project.

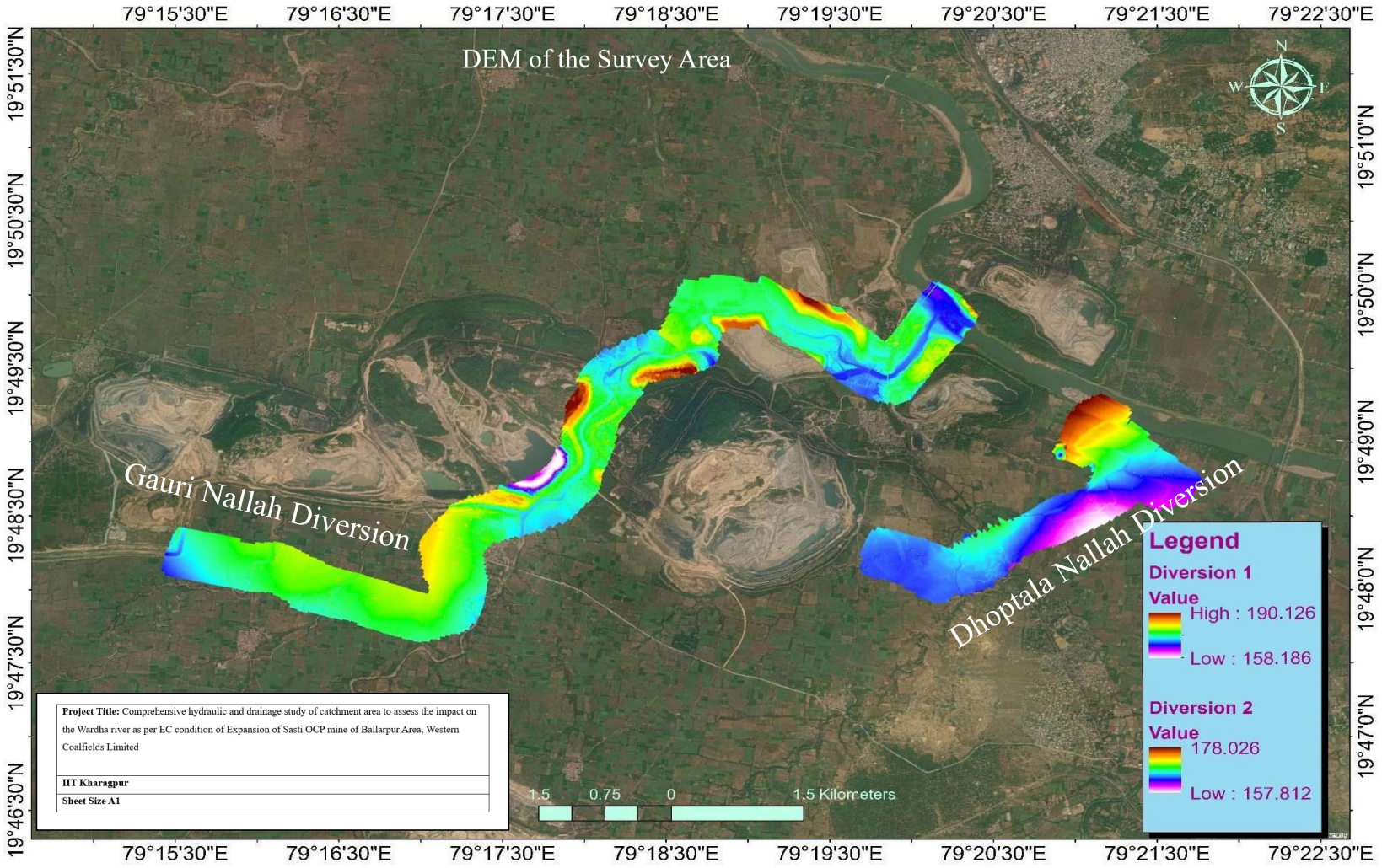


Figure 4. 4 DEM of Diversions

4.5 Integration of Cartosat Dem With Dem Generated from Survey

In the context of the present study, the integration of Digital Elevation Models (DEMs) derived from different sources was crucial for achieving accurate topographical representation along the diversions. The primary sources of DEMs in this study included the high-resolution DEM generated from the drone survey conducted along Diversion 1 and Diversion 2, and the CARTOSAT DEM, which was downloaded for broader flood mapping purposes. The following sections provide a detailed description of the integration process and its significance for the study.

Drone Survey and DEM Generation

The drone survey carried out for this project covered a 12-kilometer stretch along Diversion 1 and a 4-kilometer stretch along Diversion 2. The drone was flown at an altitude of 100 meters, capturing high-resolution imagery with a Ground Sampling Distance (GSD) of 5 centimeters. This high level of detail allowed for the generation of a very accurate DEM that reflected the subtle topographical variations along the diversions. Generated DEM is shown in Figure 4.4. This DEM was essential for designing the diversions and for assessing potential flood risks along these channels.

Cartosat Dem for Flood Mapping

To complement the high-resolution DEM from the drone survey, a CARTOSAT DEM was downloaded to cover the broader study area, including the regions beyond the immediate diversions from the basin. CARTOSAT DEMs, though less detailed than the drone-generated DEMs, offer extensive coverage that is particularly useful for regional flood mapping and analysis. The CARTOSAT DEM provided a macro-level view of the terrain, encompassing the entire area influenced by the Wardha River and its surrounding catchment.

Integration of DEMs

The integration process involved merging the high-resolution DEMs generated from the drone survey with the CARTOSAT DEM. This was done to ensure that accurate elevation levels were maintained along the diversions while also allowing for comprehensive flood mapping across the wider area. The merging process was carefully executed to preserve the high level of detail in the areas surveyed by the drone while seamlessly blending with the broader CARTOSAT data. This integration provided a unified DEM that was both detailed and extensive, making it suitable for advanced hydrological and hydraulic modeling. Figures 4.5 and 4.6 in the report provide a visual representation of the DEM before and after the integration. These figures highlight the

improvements in topographical accuracy achieved through the integration process, showing how the diversions were effectively incorporated into the broader flood mapping framework.

Impact Study and Backwater Analysis

With the diversions ultimately discharging into the Wardha River downstream, the integrated DEM allowed for a thorough impact study on the surrounding villages and infrastructure. The HEC-RAS model was used to assess not only the direct impact of flooding within the diversions but also the potential backwater effects from the Wardha River. This was particularly important in understanding how high water levels in the river could influence the flow and flood potential within the diversions. The backwater effect was modeled to predict scenarios where river levels might rise and cause reverse flow or increased water levels within the nallahs, leading to potential flooding of nearby areas.

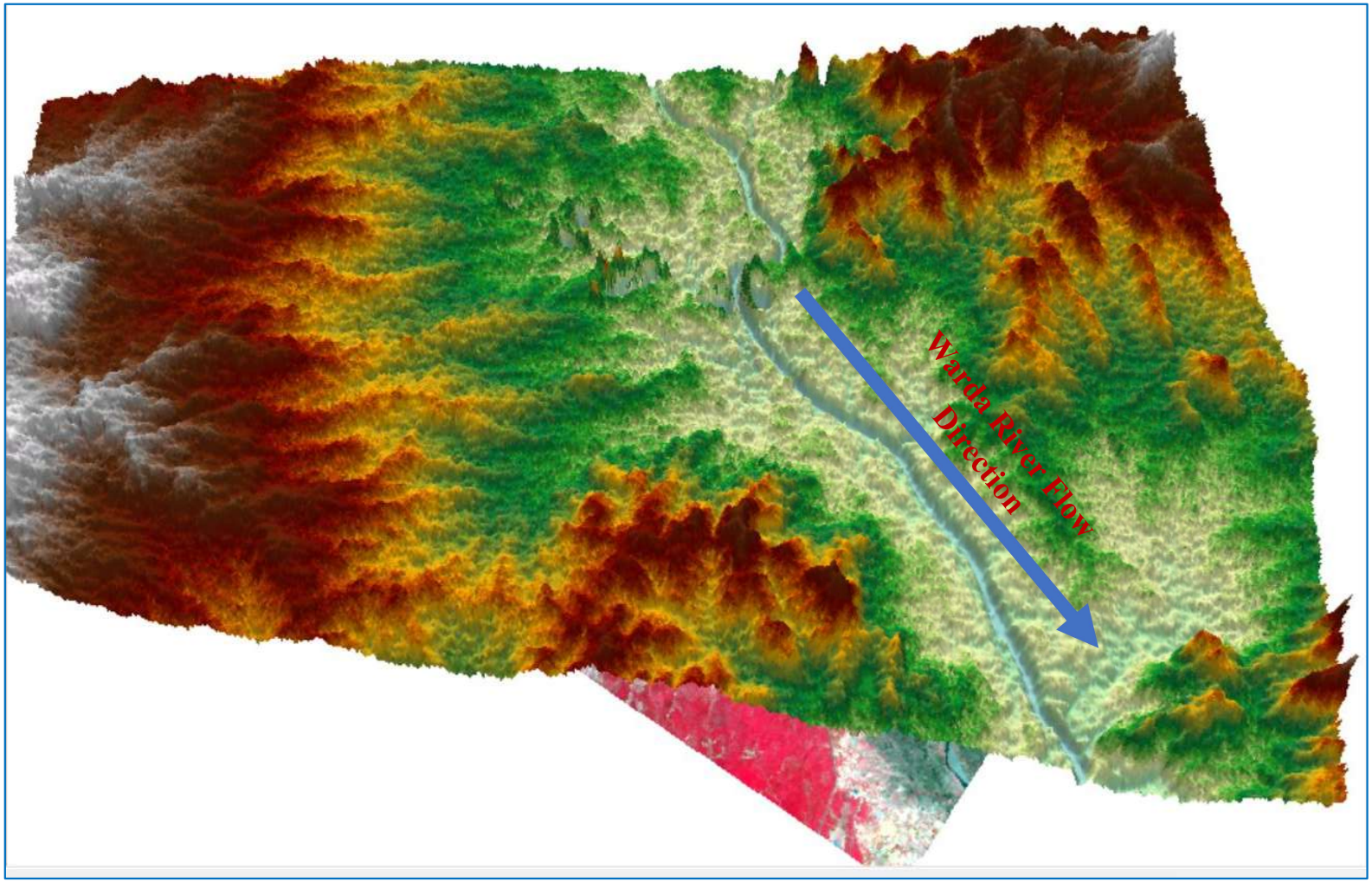


Figure 4. 5 DEM of Study area before Integration of Nallahas.

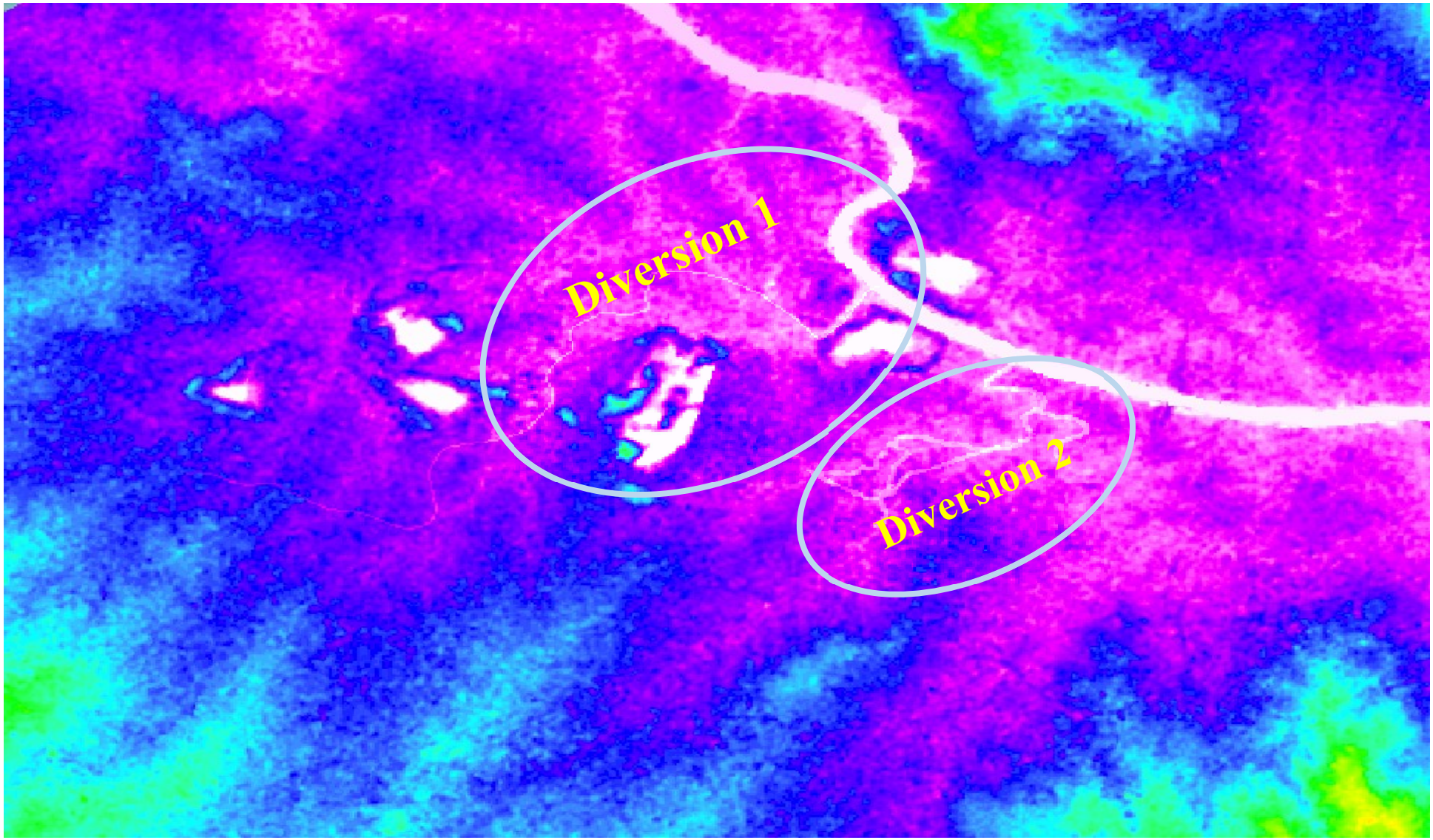


Figure 4. 6 DEM of Study area after Integration of Nallahs

CHAPTER 5: BASIN DELINEATION AND DEMARCATION OF DRAINAGE

5.1 Background

Basin delineation plays a pivotal role in the expansion of the Ballarpur and Sasti mine areas, particularly due to the presence of the Wardha River and five nearby nallahs. This process involves identifying the watershed boundaries and understanding the flow dynamics within the catchment area, which is crucial for several reasons. Firstly, by delineating the basin, we can accurately determine the catchment area that contributes runoff to the Wardha River and the adjacent nallahs. This is essential for predicting how mining activities might alter the natural water flow and distribution patterns. Understanding these changes helps in assessing the potential impacts on water resources and devising strategies to mitigate any adverse effects.

Secondly, basin delineation aids in effective flood management. By mapping the flow paths and calculating flow accumulation, we can identify areas prone to flooding due to altered runoff patterns from mining operations. This information is vital for designing flood control measures and ensuring that the mine expansion does not increase the flood risk for surrounding areas. Moreover, knowing the exact flow directions and accumulation points helps in planning the diversion of nallahs, ensuring that the diverted water does not adversely impact the local hydrology or the Wardha River. One can utilize the contour map to determine the ridge line, which is indicated by the highest contour line. The watershed area can be identified as the enclosed region within the path of the ridge line.

5.2 Basin Delineation Methodology using GIS and RS

An alternative approach involves utilizing for basin delineation is GIS Raster images, which are employed in the current investigation. These images are subjected to processing in ArcGIS software to delineate the basin which is shown in flow diagram 5.1 (Figure 5.1), resulting in the identification of the watershed area within the basin. The watershed is visually distinguished by employing various colors. The following steps must be followed in ArcMap for basin delineation. 1. Select the fill option. 2. Direction of flow. 3. Calculation of flow accumulation. 4. Condition (abbreviated as "Con.") 5. Classification of streams based on their position in a hierarchical network. 6. Streaming functionality. 7. Reservoir.

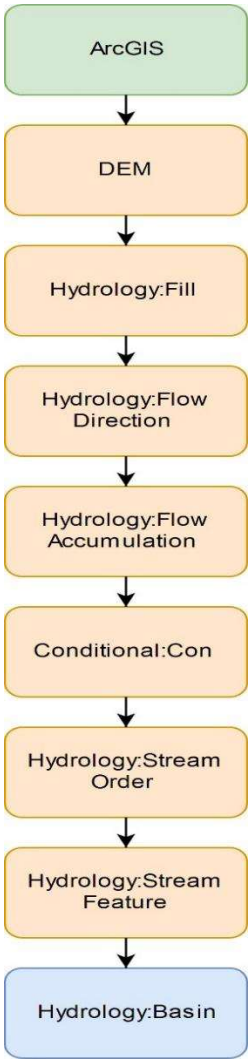


Figure 5. 1 Presents a flow chart outlining the process of basin delineation using ARC GIS.

5.2.1 Watershed Delineation

In the context of the Ballarpur and Sasti mine areas, basin delineation was conducted using Cartosat Digital Elevation Model (DEM) having 30m resolution. This high-resolution DEM enabled precise identification of the watershed boundaries for the entire Wardha River basin as shown in . By accurately delineating the basin, the comprehensive drainage network for all five nallahs—Shivlam Nallah, Dhoptala Nallah, Chincholi Nallah, Gouri Nallah, and Sakhari Nallah—was extracted. The delineation and subsequent drainage network extraction provided critical insights into the hydrological dynamics of the region.

The analysis revealed that among the five nallahs, Gouri Nallah and Dhoptala Nallah are the two major ones. Further investigation showed that Sakhari and Chincholi Nallah are tributaries of Gouri Nallah, while Shivlam Nallah is a tributary of Dhoptala Nallah. The figure 5.2 illustrates Stream Order Statistics (Gouri and Dhoptala Watershed). The distribution of stream lengths across different stream orders within the Gouri and Dhoptala watersheds. It shows that first-order streams, which are the smallest and most numerous, dominate the watershed with the longest cumulative length. As the stream order increases, the total length of streams decreases significantly, with second-order streams also having a substantial presence, while higher-order streams (third to fifth) are less extensive. This hierarchical structure of the drainage network is depicted in Figure 5.3 for Wardha River and Figure 5.4 shows the stream order for Gouri and Dhoptala Watershed.

A stream order map up to the 8th order was generated using the Cartosat DEM to thoroughly capture the drainage network at the Ballarpur and Sasti mine sites. In this hierarchical classification, the Wardha River is classified as an 8th-order stream, indicating its significance and the number of tributaries it has accumulated. Gouri Nallah, with an order of 4, is a major tributary, while other nallahs, such as Dhoptala Nallah, have orders ranging from 2 to 3 as shown in figure 7. This detailed mapping ensures that all watercourses, including smaller nallahs, are precisely identified and analyzed, which is essential for effective water management, flood control, and mitigating the environmental impacts of mining activities.

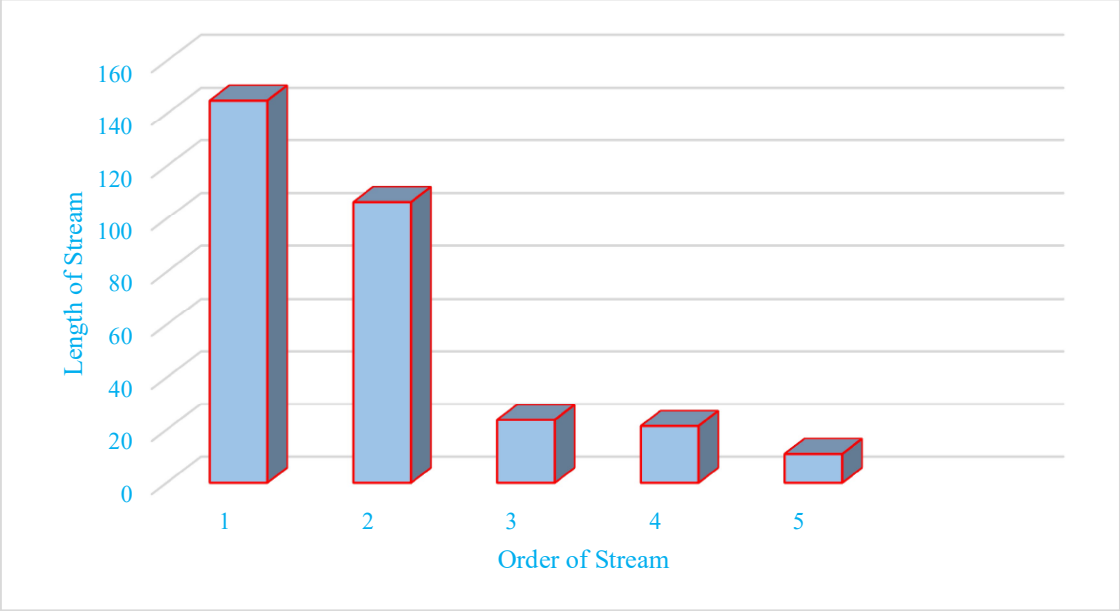


Figure 5. 2 Stream Order Statistics

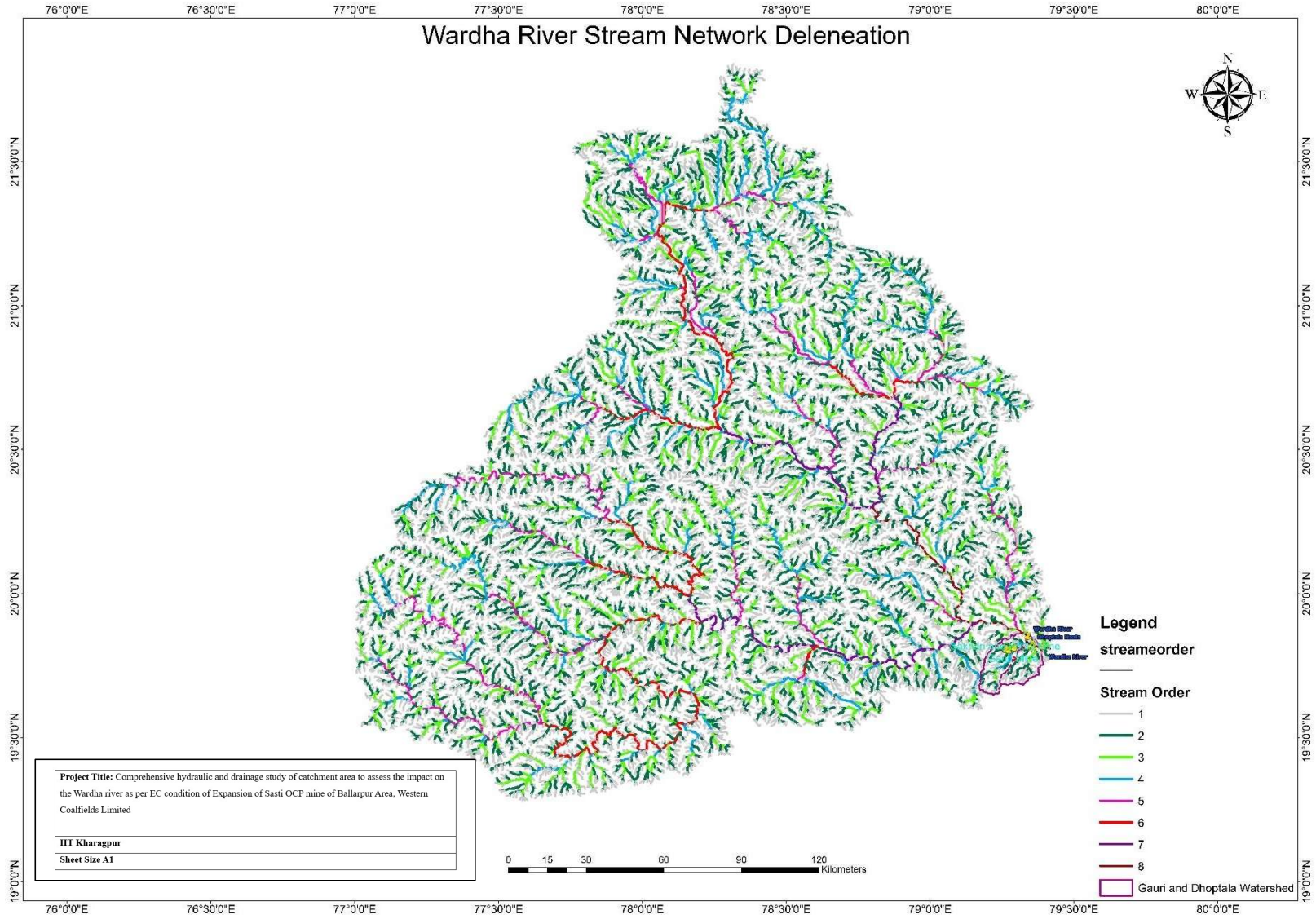


Figure 5. 3 Stream Order Map of Gouri and Dhoptala Nallaha

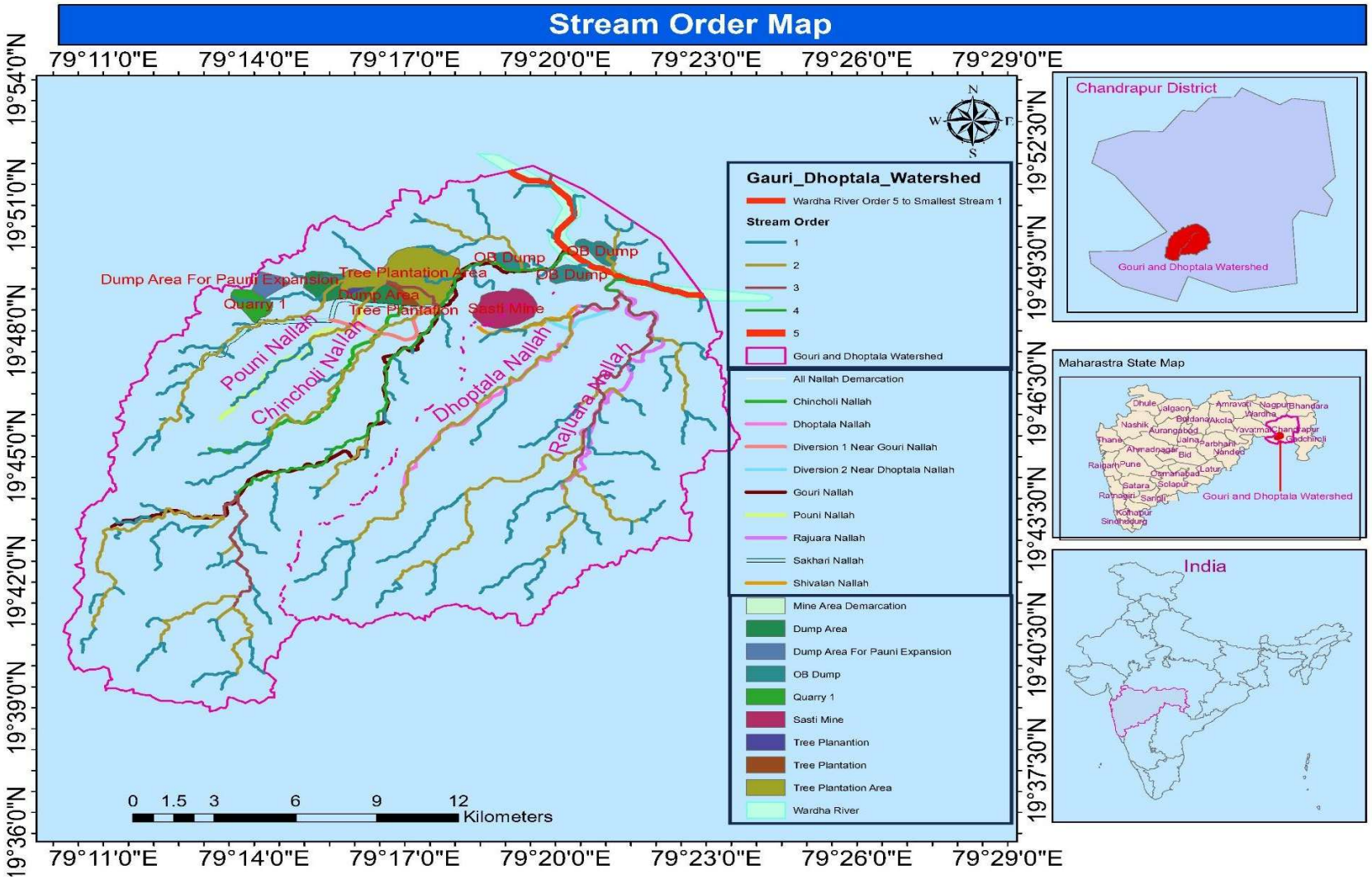


Figure 5. 4 Stream Order Map of Gouri and Dhoptala Nallaha

CHAPTER 6: GEOTECHNICAL INVESTIGATIONS

6.1 Soil Characteristics and Geotechnical Investigation

The Ballarpur area in Chandrapur district, Maharashtra, is predominantly characterized by black cotton soil, also known as regur soil, which is known for its high clay content, fine texture, and significant water retention capacity. This soil type is prone to swelling when wet and shrinking when dry, leading to challenges such as soil cracking, low bearing capacity, and poor drainage. These characteristics make the region difficult for construction and infrastructure development, as the soil's low shear strength and high compressibility can result in issues like foundation settlement, slope instability, and subsidence, particularly in areas affected by underground coal mining. Additionally, alluvial soils are found closer to the Wardha River, but these are less prevalent in the mining zones.

Geotechnically, the black cotton soil in Ballarpur poses several challenges. Its low bearing capacity, which typically ranges from 5 to 15 tons per square meter, necessitates soil stabilization techniques such as lime or cement treatment to improve load-bearing capacity. The soil's high optimum moisture content and low permeability further complicate compaction and drainage efforts, increasing the risk of waterlogging and slope failures. In mining areas, the risk of subsidence and slope instability is heightened due to the soil's weak mechanical properties. Effective management of these geotechnical risks requires regular monitoring, the use of reinforcement techniques like geosynthetics, and the implementation of comprehensive drainage control measures to ensure the safety and sustainability of mining operations and associated infrastructure.

6.2 Soil Characteristics

6.2.1 Soil Types

- **Black Cotton Soil (Regur Soil)**: The predominant soil type in the Ballarpur region is black cotton soil. This soil is rich in clay and is known for its high water retention capacity. It is primarily formed from the weathering of basaltic rocks.

    - **Texture**: Black cotton soil has a fine texture with high clay content, typically ranging between 40-60% clay, which leads to its characteristic swelling and shrinking properties.
    - **Color**: The soil is dark, often black or deep brown, due to the presence of organic matter and iron.
    - **pH Level**: The soil is generally neutral to slightly alkaline, with a pH ranging from 6.5 to 8.5.
- **Alluvial Soil**: In some parts of the Wardha River basin, especially closer to the river, alluvial soils are present. These soils are lighter in texture, consisting of sandy loam or silty clay loam.
    - **Texture**: Alluvial soil is usually lighter than black cotton soil, with a balanced mixture of sand, silt, and clay.
    - **Fertility**: Alluvial soils are fertile and support agriculture, but they are less common in the immediate mining areas.

6.2.2 Soil Properties

- **Swelling and Shrinkage**: The high clay content in black cotton soil makes it prone to swelling when wet and shrinking when dry. This characteristic can lead to soil cracking, which poses challenges for construction and infrastructure development.
- **Water Retention**: The soil's high clay content gives it a strong ability to retain moisture, which is beneficial for certain crops but can lead to poor drainage and waterlogging in heavy rains.
- **Nutrient Content**: Black cotton soil is generally rich in calcium carbonate, magnesium, and potash but can be deficient in nitrogen and phosphorus. The soil's fertility supports cotton cultivation and other crops like sorghum, pulses, and soybean.

6.2.3 Geotechnical Properties

Bearing Capacity

- **Low Bearing Capacity**: Black cotton soil has a relatively low bearing capacity due to its high clay content and swelling properties. This can pose challenges for construction, particularly for foundations and heavy structures.

- **Typical Bearing Capacity**: The safe bearing capacity of black cotton soil can range from 5 to 15 tons per square meter, depending on the moisture content and compaction.
- **Stabilization Requirements**: For construction projects, soil stabilization techniques such as the use of lime, cement, or geosynthetics may be required to improve the bearing capacity.

6.2.4 Compaction Characteristics

- **High Optimum Moisture Content**: Black cotton soil requires a higher moisture content for optimal compaction due to its clay content. The optimum moisture content (OMC) is typically around 20-30%, with a maximum dry density (MDD) in the range of 1.5 to 1.8 g/cm³.
- **Difficulties in Compaction**: Achieving proper compaction can be challenging, particularly during the dry season when the soil tends to crack and harden.

6.2.5 Shear Strength

- **Low Shear Strength**: The undrained shear strength of black cotton soil is relatively low, particularly when the soil is wet. This low shear strength can lead to issues like slope instability and landslides, especially in open cast mining areas.
  - **Typical Values**: The cohesion of the soil can range from 10 to 25 kPa, while the internal friction angle is typically low, around 15 to 25 degrees.

6.2.6 Permeability

- **Low Permeability**: Due to its fine texture and high clay content, black cotton soil has low permeability. This characteristic leads to slow water infiltration and can result in waterlogging during heavy rainfall.
  - **Hydraulic Conductivity**: The hydraulic conductivity of black cotton soil is typically very low, in the range of 10^-6 to 10^-8 m/s.

6.2.7 Geotechnical Challenges in Mining Areas

Mine Subsidence

- **Risk of Subsidence**: The underground coal mining activities in Ballarpur pose a risk of subsidence, particularly in areas with weak overburden and fractured rock strata. The low shear strength and high compressibility of the overlying black cotton soil can exacerbate this problem.

Foundation Challenges

- **Foundation Settlement**: Construction in areas with black cotton soil requires careful consideration of foundation design due to the soil's tendency to swell and shrink. Shallow foundations may be prone to settlement and cracking, necessitating deep foundations or soil stabilization.

6.2.8 Mitigation and Management Strategies

Soil Stabilization

- **Lime and Cement Stabilization**: To improve the load-bearing capacity and reduce the swelling properties of black cotton soil, lime and cement stabilization are commonly used. These additives help to bind the soil particles and reduce plasticity.

Drainage Control

- **Surface and Subsurface Drainage**: Proper drainage systems are essential to manage waterlogging and prevent soil erosion. Surface drains, culverts, and subsurface drainage systems can help to divert water away from sensitive areas.

6.2.9 Reinforcement Techniques

- **Geosynthetics and Reinforced Earth**: The use of geosynthetics, such as geotextiles and geogrids, can reinforce soil in mining areas and improve slope stability. These materials help distribute loads and reduce the risk of failure.

6.2.10 Particle Size Distribution

The particle size distribution (PSD) graph collected around the Sasti Mine in Ballarpur, Maharashtra, provides valuable insights into the nature of sediments in the region. The X-axis represents particle size on a logarithmic scale, ranging from very fine particles (0.001 mm) to coarse particles (10 mm), while the Y-axis shows the cumulative percentage passing, indicating the proportion of material finer than a particular size.

The graph reveals that the sediment predominantly consists of fine to medium-sized particles, as evident from the steep increase in the percentage passing between 0.01 mm and 1 mm. D_{50} is around 0.02mm. This range captures the bulk of the material, suggesting that the sediment is dominated by silt and sand-sized particles. At smaller particle sizes (below 0.01 mm), the percentage passing remains relatively low, indicating a limited fraction of clay-sized particles. On the other hand, the gradual flattening of the curve beyond 1 mm suggests that coarser fractions, such as gravel, are present in smaller quantities.

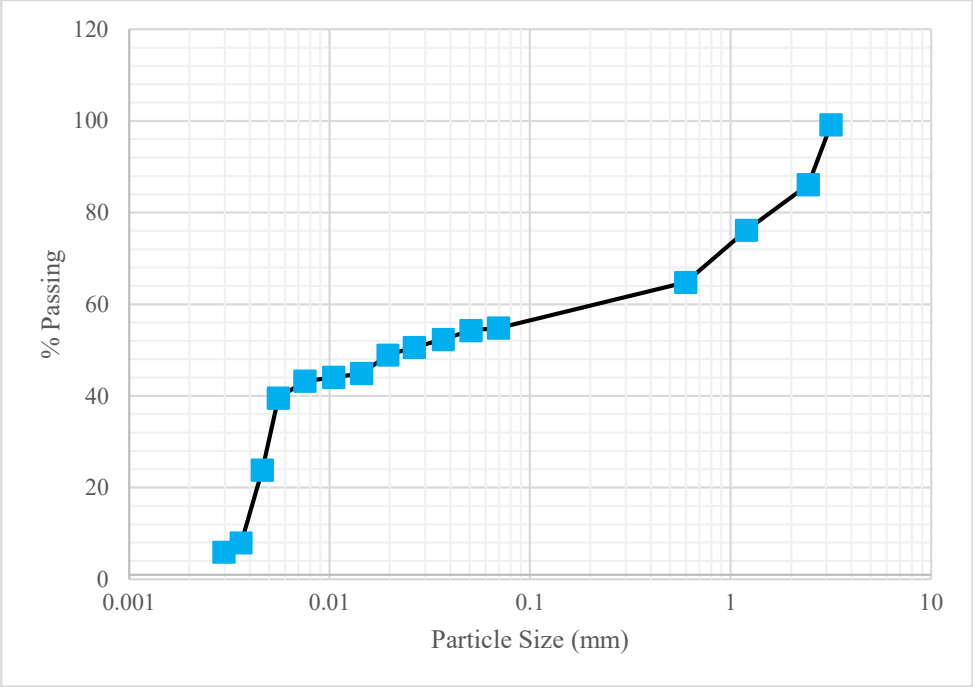


Figure 6. 1 Particle Size distribution Graph

Table 6.1 Geotechnical Investigations of Soil around the Mine area

Aspect	Details
Soil Types	**Black Cotton Soil (Regur Soil)**: Rich in clay, high-water retention, formed from basaltic rock weathering.
	Alluvial Soil: Found near Wardha River, lighter texture, sandy loam or silty clay loam, fertile.
Soil Texture	**Black Cotton Soil**: Fine texture, 40-60% clay.
	Alluvial Soil: Lighter, balanced sand, silt, and clay mix.
Soil Color	**Black Cotton Soil**: Dark, black or deep brown due to organic matter and iron.
Soil pH	**Black Cotton Soil**: Neutral to slightly alkaline, 6.5-8.5 pH.
Soil Fertility	**Black Cotton Soil**: Rich in calcium carbonate, magnesium, potash, but low in nitrogen and phosphorus. Supports cotton, sorghum, pulses, and soybeans.
	Alluvial Soil: Fertile but less common in mining areas.
Swelling & Shrinking	**Black Cotton Soil**: Swells when wet, shrinks when dry, leading to cracking.
Water Retention	**Black Cotton Soil**: High water retention due to clay content, prone to poor drainage and waterlogging.
Bearing Capacity	**Black Cotton Soil**: Low bearing capacity (5-15 tons/m²). Requires stabilization for construction.
Compaction	**Black Cotton Soil**: Optimum moisture content: 20-30%. Maximum dry density: 1.5-1.8 g/cm³.
Shear Strength	**Black Cotton Soil**: Low undrained shear strength (10-25 kPa). Internal friction angle: 15-25°.
Permeability	**Black Cotton Soil**: Low permeability, hydraulic conductivity of 10^-6 to 10^-8 m/s.
Mine Subsidence Risk	High risk of subsidence due to weak overburden and fractured rock strata.

CHAPTER 7: HYDROLOGIC MODELLING

7.1 Introduction

Accurate streamflow prediction is fundamental for effective water resource management, the design of hydraulic structures, and disaster mitigation. This becomes even more critical in ungauged basins, where direct measurements of streamflow are unavailable. In such cases, hydrological modeling serves as a crucial tool, providing predictions of streamflow by simulating the hydrological processes within a catchment area. These models use simplified mathematical expressions to represent the movement and distribution of water, simulating key processes such as infiltration, evaporation, runoff generation, and routing. The outputs of hydrological models typically include streamflow predictions, water levels, soil moisture, evapotranspiration, and groundwater levels.

Hydrological models are categorized based on their model structure/process description, spatial discretization, and temporal simulation methods. Model structure includes three main classifications: physics-based, conceptual, and black box models. Physics-based models simulate processes using physical laws, offering high accuracy but requiring extensive data and computational resources. Conceptual models simplify these processes into components such as reservoirs and fluxes, providing a balance between ease of calibration and physical realism. Black box models, on the other hand, rely on empirical relationships, making them straightforward to use but less interpretable.

In terms of spatial discretization, models are classified as distributed, semi-distributed, and lumped. Distributed models provide high resolution by dividing the catchment into grid cells, capturing spatial variability in detail. Semi-distributed models offer a compromise by dividing the catchment into sub-catchments, balancing detail with efficiency. Lumped models treat the catchment as a single unit, simplifying computations but lacking spatial detail.

For temporal simulation, models can be either continuous or event-based. Continuous models are suited for long-term analysis, capturing ongoing hydrological processes over extended periods. In contrast, event-based models focus on specific hydrological events, providing detailed insights into particular incidents.

In ungauged basins like Ballarpur-Sasti, hydrological modeling is indispensable for gaining insights into the basin's hydrological regime. By simulating streamflows, these models provide valuable estimates of peak discharge values, facilitating informed decision-making for water management, structural design, and disaster preparedness.

7.2 Description of Study area in Hydrologic Point of View

The Ballarpur-Sasti Mine is strategically located in the downstream part of the Wardha sub-basin, which forms a part of the larger Godavari River basin (Figure 7.1). Specifically, it lies near the Bamni (Balharsha) flood gauging station, with its associated catchment area referred to as the Bamni (Balharsha) catchment. Positioned at the downstream end of this catchment, the Ballarpur-Sasti Mine plays a crucial role in regional hydrology. The mine's outlet, designated as Outlet 5 (Figure 7.3), serves as the terminal point for water flow from the surrounding catchment area, which spans approximately 192.55 square kilometers.

The hydrology of the Ballarpur-Sasti Mine is shaped by inflows from several sub-catchments, each contributing through key nallahs. The Sakhari Nallah, Chincholi Nallah, Gouri Nallah, and Shivlam Nallah contribute to the Designed Discharge outlet, Naala outlet-1, Naala outlet-2, and Naala outlet-4, respectively. These individual nallahs merge into a single stream at Gouri, creating a combined flow downstream. At Gouri, the Shivlam Nallah joins this merged stream, adding to its discharge capacity.

The combined flow from Gouri continues downstream to Naala outlet-5, which is located just downstream of the Wardha Bridge at Sasti. This outlet represents the final point where the water from the mine's catchment area enters the Wardha River, a significant tributary of the Godavari River. The integrated flow dynamics of these sub-catchments highlight the complexity of managing water resources in the region, especially considering the varying contributions from

each nallah and the strategic location of the Ballarpur-Sasti Mine within the hydrological network. Figures 7.2 and 7.3 provide detailed spatial representations of the catchment area and the flow paths, emphasizing the interconnectedness of the nallahs and their critical role in regional water management.

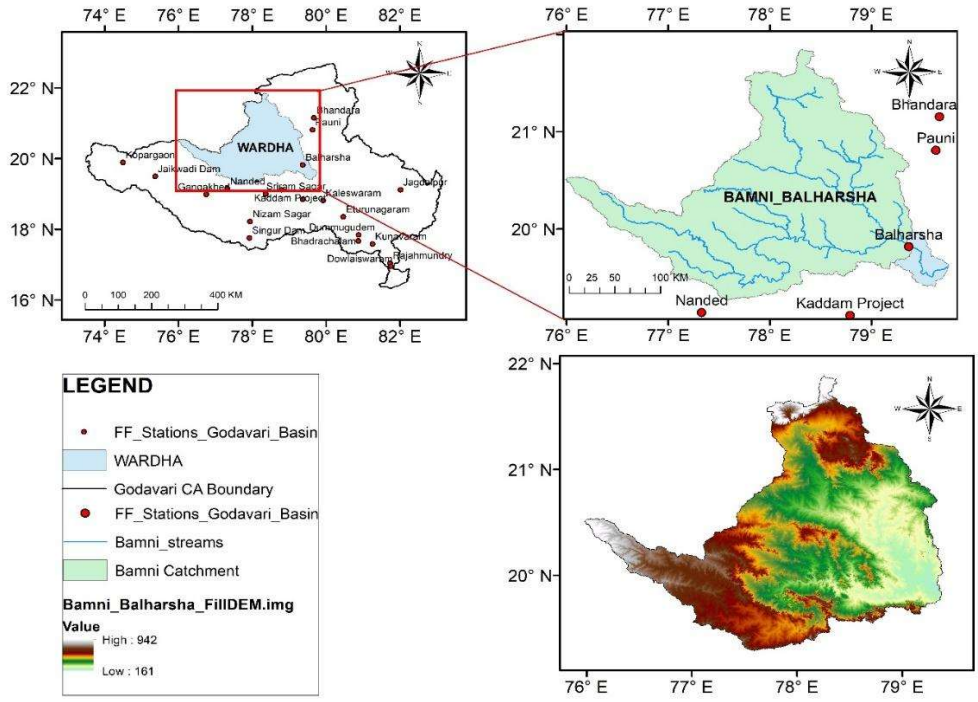


Figure 7. 1 Location map of Bamni (Balharsha) Catchment

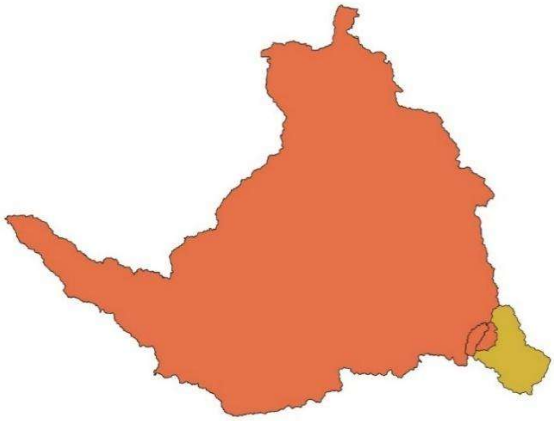


Figure 7. 2 . Ballarpur-Sasti Mine catchment located at the downstream end of Bamni (Balharsha) catchment

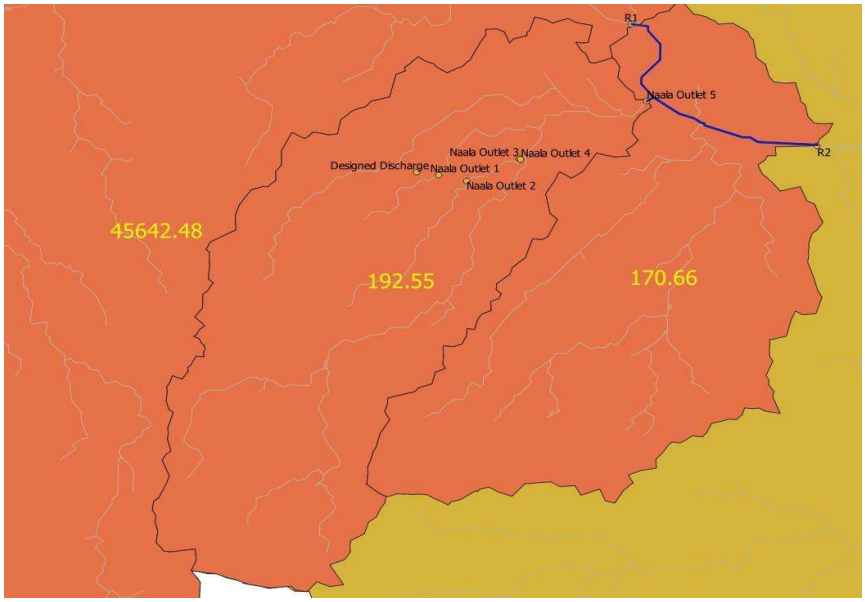


Figure 7. 3. Ballarpur-Sasti Mine catchment with outlets on interior streams

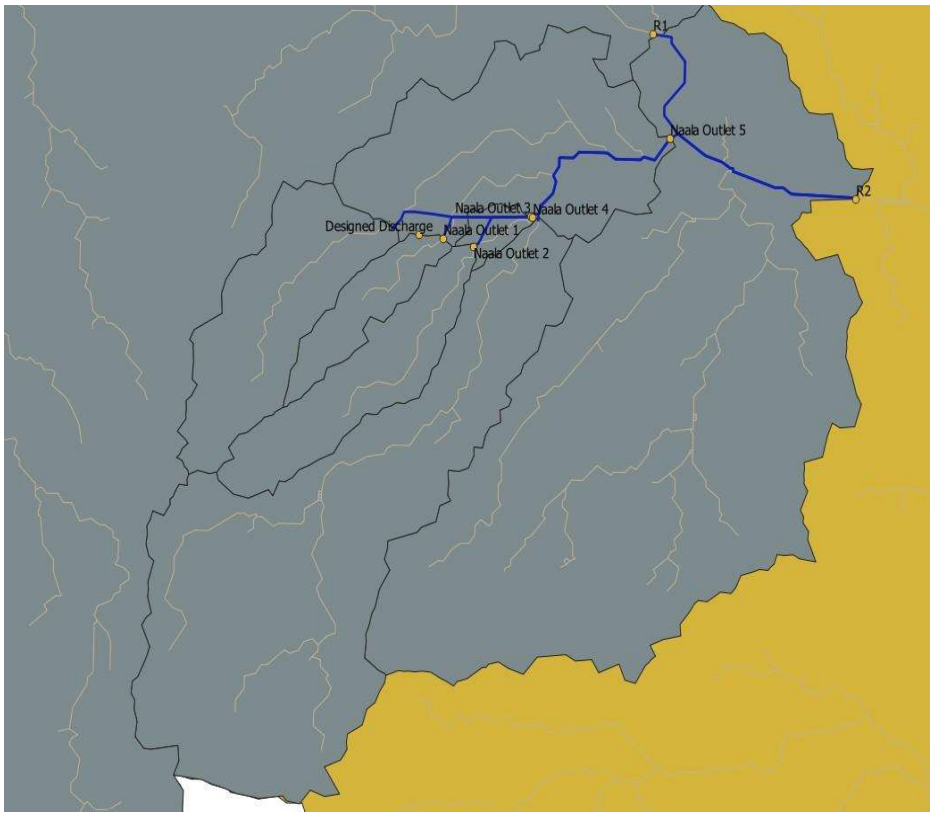


Figure 7. 4 Layout showing sub-catchments of Ballarpur-Sasti Mine catchment

It is proposed to divert the streamflows of Sakhari Nallah at the Designed Discharge outlet, Chincholi Nallah at Outlet 2, and a small nallah at Outlet 1 to their confluence point at Gouri, directing them into the Gouri Nallah at Outlet 3. Based on these requirements, the streamflows at the Designed Discharge outlet, Outlet 2, and Outlet 1 need to be estimated. The catchments corresponding to each outlet is shown in the Figure 7.4. Additionally, the discharge from the catchment corresponding to Outlet 4 also contributes to the flow at the Gouri confluence (Figure 7.5). Therefore, hydrological analysis is conducted at all the outlets as shown in Figures 7.4 & 7.5.

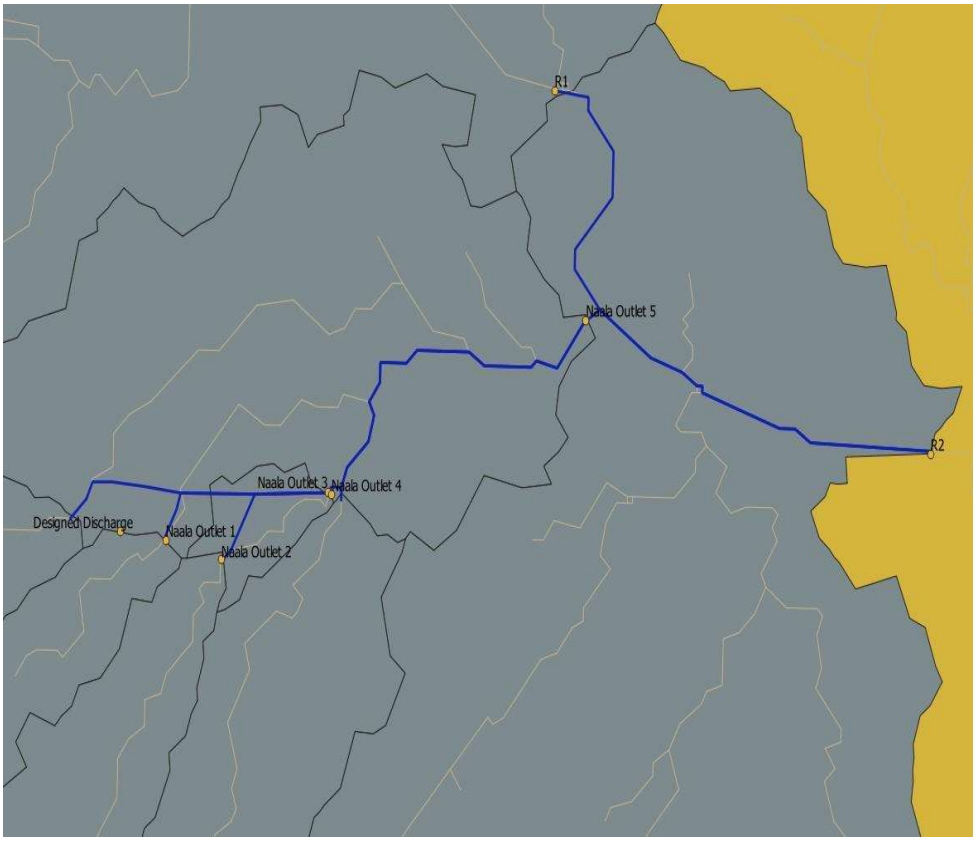


Figure 7. 5. Layout showing hydrologic modelling of Ballarpur-Sasti Mine catchment

7.3 Input Data Preparation and Pre-Processing

For this study, several critical data sources were utilized to ensure accurate hydrological modeling and analysis. The gridded daily rainfall data, which has a spatial resolution of 0.25 x 0.25 degrees, was obtained from the India Meteorological Department (IMD) database. This data, essential for precipitation analysis, can be downloaded from the IMD website

https://www.imdpune.gov.in/Clim_Pred_LRF_New/Grided_Data_Download.html. In addition, daily maximum and minimum temperature data with a spatial resolution of 1 x 1 degree were also sourced from the IMD database to support the calculation of potential evapotranspiration and other temperature-dependent parameters.

The observed streamflow data for the Bamni (Balharsha) flood forecasting station, which spans from 1965 to 2019, was collected from the India-WRIS website. This site provides comprehensive river monitoring data and can be accessed for download https://indiawris.gov.in/wris/#/RiverMonitoring.

Elevation data, crucial for understanding the topography of the catchment area, was obtained in the form of a Digital Elevation Model (DEM) with a resolution of 90 meters from NASA's Shuttle Radar Topography Mission (SRTM). This high-resolution elevation data supports accurate spatial analysis and model calibration by providing detailed topographical information necessary for hydrological simulations.

The potential evapotranspiration (ET) is computed using the FAO-56 Penman-Monteith method. Given the availability of precipitation, maximum, and minimum temperature data, other required variables for ET computation are estimated using the procedure outlined for estimating missing climatic data in FAO Irrigation and Drainage Paper 56. The mean monthly precipitation along with mean monthly ET is illustrated in Figure 6.6. Since the total area is below 200 square kilometers, which is less than the spatial resolution of IMD gridded precipitation data, no spatial variability is observed. Consequently, similar mean monthly precipitation values are observed across all sub-basins. The monsoon season (June to September) contributes approximately 89% of the annual precipitation, with mean monthly precipitation values of 184 mm, 347 mm, 341 mm, and 183 mm for June, July, August, and September, respectively. The mean monthly ET values range from 67 mm in December to 199 mm in May. The cumulative ET during the monsoon season is around 528 mm, which accounts for approximately 36% of the mean annual ET.

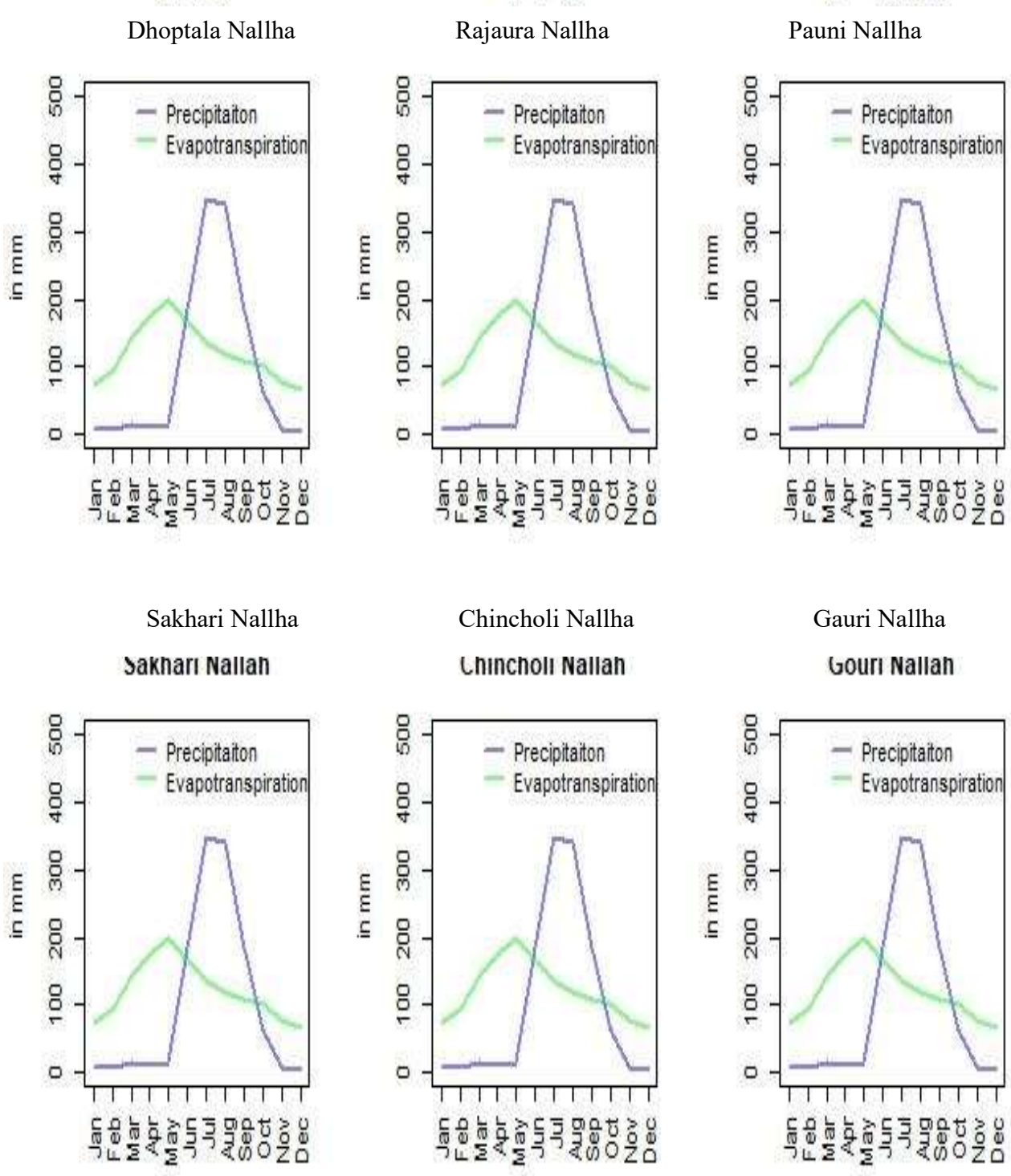


Figure 7. 6 Mean Monthly Precipitation and Evapotranspiration computed using IMD gridded data from 1951-2020.

7.4 LULC analysis of Gouri and Dhoptala watershed

LULC map is shown in Figure 6.8. And percentage area distribution is shown in Figure 6.7. The total area of the Gouri and Dhoptala watershed regions is approximately 359.08 km². The LULC distribution for this area is as follows (Figure 6.9): Water Bodies: 4.50 km² (1.3%) Forest: 21.76 km² (6.1%) Agricultural Land: 264.44 km² (73.6%) Built-up Area: 13.59 km² (3.8%) Scrub: 4.22 km² (1.2%) Fallow Land: 50.57 km² (14.1%) Agricultural land is the predominant land use category, occupying nearly three-quarters of the total area, indicating the region's significant agricultural activity. Fallow land and forest areas follow, highlighting areas not currently under cultivation and regions of natural vegetation, respectively. Built-up areas and scrub lands make up smaller portions of the watershed, while water bodies are the least extensive.

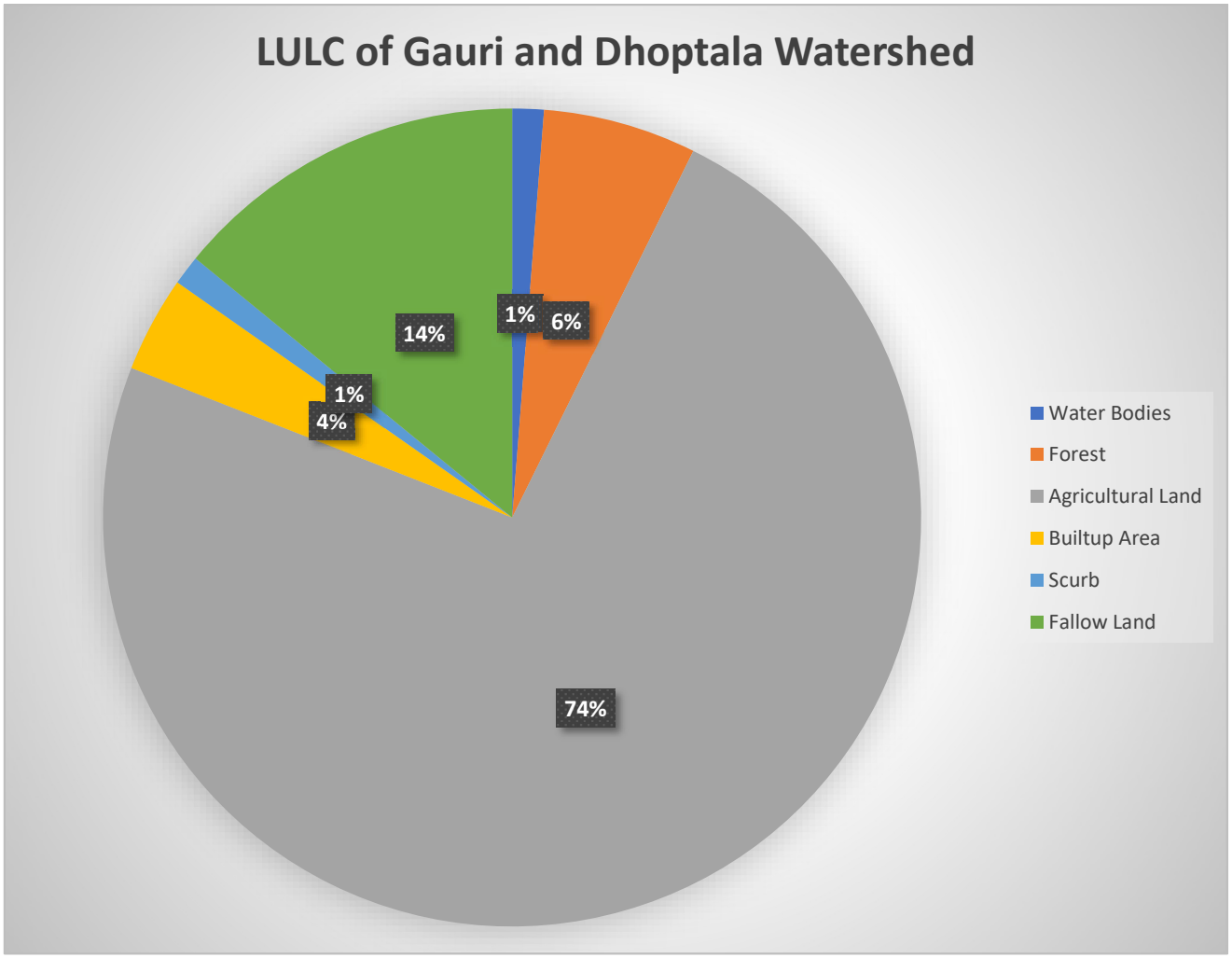


Figure 7. 7. LULC area percentage wise distribution

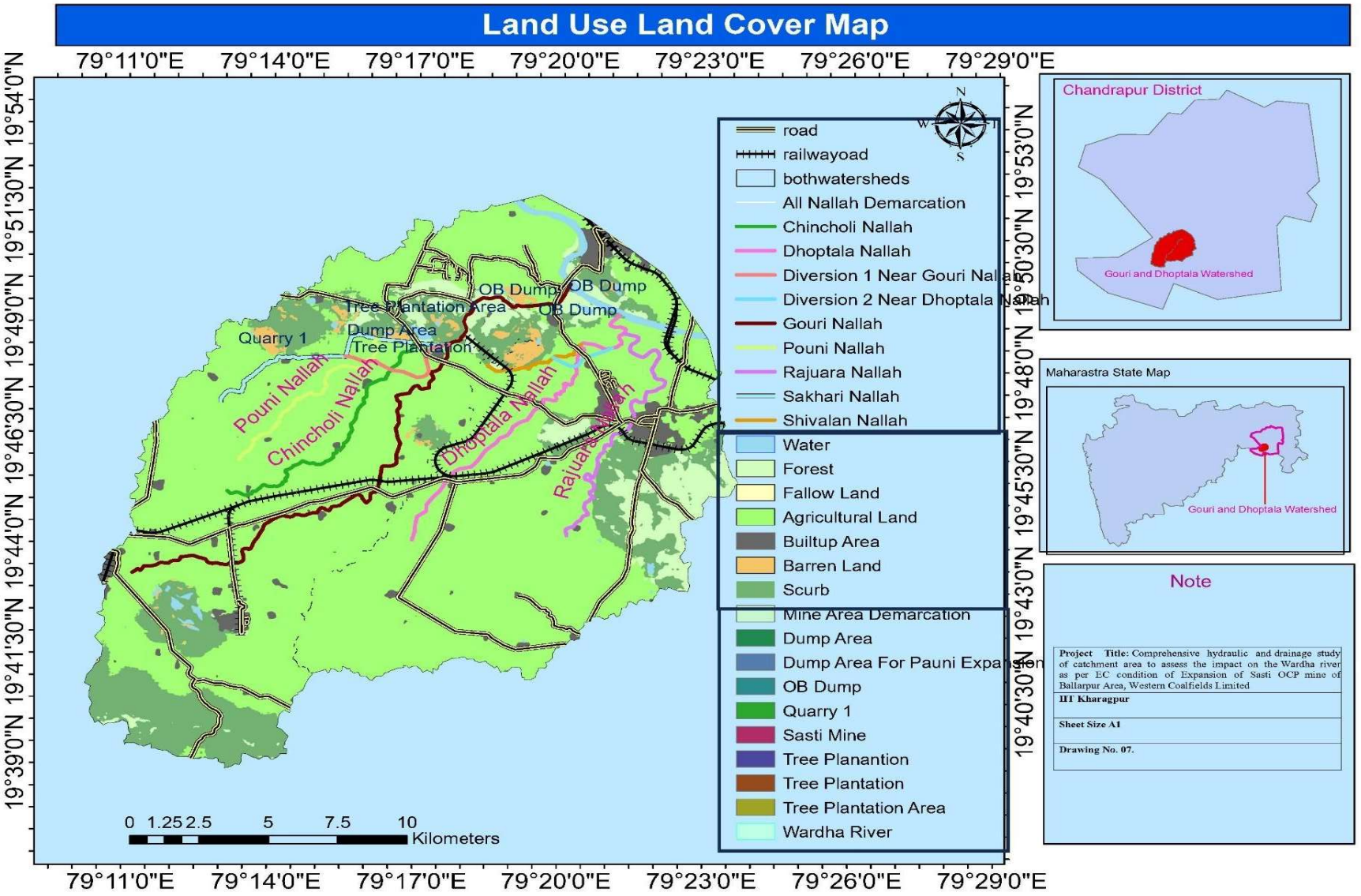


Figure 7. 8 LULC Map of Gauri and Dhoptala Watershed

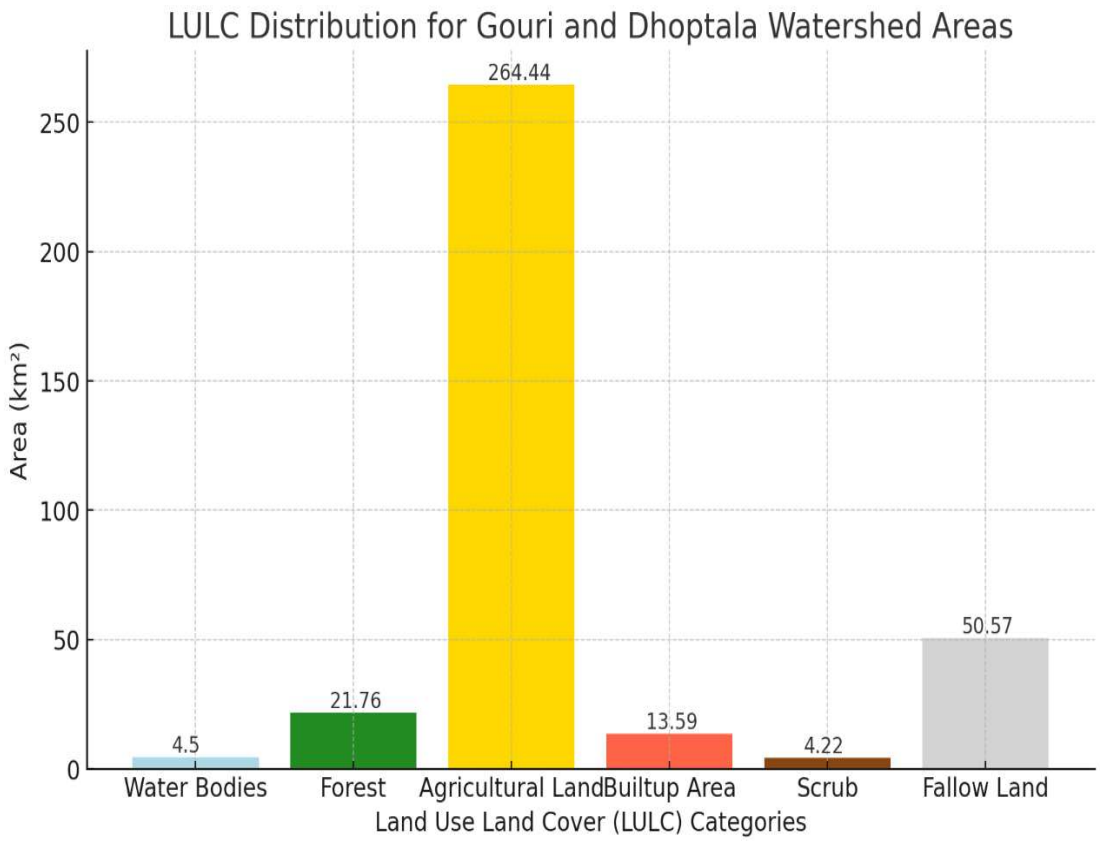


Figure 7. 9. LULC area in Sq.km

7.5 The HEC-HMS model

The Hydrologic Engineering Center's Hydrologic Modeling System (HEC-HMS), developed by the Hydrologic Engineering Center (HEC) of the US Army Corps of Engineers (USACE), is a comprehensive tool designed to simulate hydrological processes across diverse geographic areas. HEC-HMS enables the detailed simulation of the rainfall-runoff process by treating each hydrological component as an individual model, with a variety of methods available for each component.

The core hydrological processes simulated by HEC-HMS include canopy storage, surface storage, infiltration losses, direct runoff, baseflow, and hydrologic channel routing. Each process can be modeled using different methods, allowing for flexibility and adaptability based on the specific

characteristics of the study area and the available data. This modular approach ensures that the model can be tailored to accurately reflect the unique hydrological conditions of various regions.

For this study, version 4.6.1 of the HEC-HMS model is utilized. This version incorporates updated features and improvements that enhance the model's capability to simulate complex hydrological processes and provide reliable predictions for water resource management and flood forecasting.

7.5.1 HEC-HMS model structure

The model structure for this study integrates several hydrological methods to capture the complexity of runoff processes and to accurately simulate both surface and subsurface hydrological dynamics. The framework employs the Simple Canopy method to model canopy storage, the Simple Surface method for surface storage, and the Deficit and Constant Rate method for loss-volume calculation. For transforming excess rainfall into runoff, the ModClark method is utilized, while baseflow is modeled using the Recession method. Additionally, the Lag method is employed for channel routing, if necessary.

To address spatial variability in the runoff process—encompassing the translation and attenuation of the direct runoff hydrograph—the ModClark method is selected. This distributed-empirical parameter model is effective in capturing the spatial distribution and temporal dynamics of runoff within the basin. The ModClark method allows for detailed representation of how excess rainfall is distributed and transformed into surface runoff across the grid cells.

The Recession method is chosen to model baseflow, which is crucial both at the start of the simulation and after the completion of subsurface storage. This method is also valuable for simulating streamflow between flood events, providing a continuous representation of baseflow conditions.

Given that antecedent moisture conditions (AMC) significantly influence flood events, particularly several days before peak flows occur, a continuous model is necessary to account for ongoing changes in soil moisture content. Therefore, the Deficit and Constant Rate method is employed to model the loss process. This method effectively represents soil moisture depletion and loss between precipitation or flood events and is paired with the Simple Canopy method to account for potential evapotranspiration based on soil water extraction.

Finally, the Lag method is used for channel routing, which represents the translation of flood waves through the watershed. This method maintains the shape of the inflow hydrograph but lags it in time by a specified duration to reflect the routing effects. Together, these methodologies provide a comprehensive model structure capable of accurately simulating hydrological processes and runoff dynamics across the basin.

7.5.2 Setting-up of the HEC-HMS distributed model

The HEC-HMS model is configured in a distributed mode, where the basin is represented through grid cells, capitalizing on the availability of gridded terrain and meteorological data. Given that terrain data (Digital Elevation Model, DEM) and meteorological inputs such as precipitation, temperature, and radiation are available in a gridded format, utilizing a distributed model is highly recommended for capturing spatial variability across the basin.

In this study, the ModClark gridded transform method is employed. This method is a linear quasi-distributed unit hydrograph approach designed for transforming precipitation excess into surface runoff. It requires both a gridded basin and gridded meteorological data to function effectively. The ModClark method integrates gridded shortwave radiation, gridded precipitation, and gridded evapotranspiration data, ensuring that the spatial distribution of these variables is accounted for in runoff modeling.

For this analysis, the HEC-HMS model is set up at a 10 km grid resolution. To facilitate distributed modeling, HEC-HMS requires gridded surface time-series data, known as gridsets. The 10 km gridded surface time-series data is generated using GageInterp, a program developed by the US Army Corps of Engineers Hydrologic Engineering Center. GageInterp performs re-gridding of input grid point time-series data using the Inverse Distance Squared (ID2W) spatial interpolation method, capable of transforming data from any regularly or irregularly spaced grid points into a gridded surface with resolutions ranging from 10 meters to 10 kilometers.

All meteorological data utilized in this study, including observed precipitation, temperature data, and reanalysis shortwave radiation data, are re-gridded to a 10 km resolution and provided as spatially gridded inputs. For calculating evapotranspiration, the Gridded Hargreaves method is

chosen, which complements the gridded nature of the input data and enhances the model's ability to accurately simulate hydrological processes across the basin.

7.5.3 Model Calibration and Validation

A distributed hydrological model is established for the calibration analysis using an event-based modeling approach. The calibration process involves selecting five distinct flooding events from the calibration period (1994-2005) and an additional five flooding events from the validation period (2006-2015). In this study, the hydrological model is forced with hourly input data, resulting in the generation of hourly discharge values. However, the available observed data is recorded at a daily resolution. To align the model outputs with the available observed data and facilitate accurate model calibration, the hourly discharge values simulated by the model need to be converted into daily discharge values.

This conversion process involves aggregating the hourly discharge values into daily totals. By summing the hourly discharge values for each day, we obtain daily discharge values that can be directly compared with the observed daily discharge data. This approach ensures that the calibration process is conducted using consistent data formats, thereby enabling effective optimization of the model parameters. The conversion from hourly to daily discharge values is a critical step in bridging the gap between the model's high-resolution outputs and the available observed data, ultimately supporting the accurate calibration and validation of the hydrological model.

For the calibration of the model parameters, an auto-calibration technique is employed using a deterministic search method known as the 'Nelder and Mead simplex search algorithm'. This optimization process is managed through an optimization trial manager, which systematically adjusts the parameters to minimize the Root Mean Square Error (RMSE) (given in Eq. 1) of the simulated versus observed streamflows. In addition to the event-based calibration, a continuous simulation model is run over the entire calibration and validation periods to evaluate the performance of the parameter set in simulating high flows and to achieve a better Nash-Sutcliffe Efficiency (NSE) value, defined in Eq. 2. The flood events are simulated sequentially using the optimized parameter sets, and the parameter set that demonstrates the highest average NSE across all events is selected as the final optimal parameter set. This optimal set is then used to validate

the flooding events in the validation period by comparing the simulated results with the observed streamflow data. This approach ensures that the model parameters are effectively tuned to replicate observed flood events accurately and maintain robust performance across different time periods.

$$\boldsymbol{RMSE} = \sqrt[4]{\frac{\mathbf{1}}{\boldsymbol{n}}\sum_{\boldsymbol{t=1}}^{\boldsymbol{n}}[\boldsymbol{Q_{obs}(t)} - \boldsymbol{Q_{sim}(t)}]^{\mathbf{4}}}$$

$$\boldsymbol{NSE} = \mathbf{1} - \frac{\sum_{\boldsymbol{t=1}}^{\boldsymbol{n}}[\boldsymbol{Q_{obs}(t)} - \boldsymbol{Q_{sim}(t)}]^{\mathbf{2}}}{\sum_{\boldsymbol{t=1}}^{\boldsymbol{n}}[\boldsymbol{Q_{obs}(t)} - \overline{\boldsymbol{Q_{obs}}}]^{\mathbf{2}}}$$

Where, $\boldsymbol{Q_{obs}(t)}, \boldsymbol{Q_{sim}(t)}$ are the observed discharge and simulated discharge at the time step t, and $\overline{\boldsymbol{Q_{obs}}}$ are the mean of the observed discharge, and n is the number of observations for a particular event.

7.5.4 Model Calibration and Validation

The catchment R1 is represented by the parameters derived from the single-site calibration of the Bamni (Balharsha) catchment. Consequently, the calibration process for the mine area catchment and R2 catchment is focused on the discharge at Outlet R2. The optimized parameter sets for these catchments are listed in Table 7.1. To evaluate the performance of these parameter sets, they are used to simulate all five calibration events. The results, detailed in Table 62, present the Nash-Sutcliffe Efficiency (NSE) values for the combinations of parameter sets and flood events. Parameter sets 4 and 5 exhibit comparable average NSE values during the calibration period. As a result, these parameter sets are further validated against the flood events in the validation period. The validation process confirmed the robustness of both parameter sets, with average NSE values remaining consistent across the tested flood events. This consistency underscores the reliability of these parameter sets in simulating discharge and hydrological behaviors. However, parameter set 5 exhibited a slightly higher NSE value compared to parameter set 4, suggesting a marginally better performance in representing the observed data. This makes parameter set 5 the preferred choice for hydrological modeling and flood prediction in the mine area and R2 catchments, ensuring precise and effective water resource management.

Table 7. 1. Parameter values for Mine area catchment and R2 catchment

Catchment	Parameter	Parameter Set-1	Parameter Set-2	Parameter Set-3	Parameter Set-4	Parameter Set-5
Mine Area	Simple Canopy - Initial Storage	6.6292	4.11	5.64	5.87	5.98
	Simple Canopy - Max Storage	8.21	5.05	7.24	7.81	8.37
	Simple Surface - Initial Storage	25.23	11.67	17.81	19.98	23.30
	Simple Surface - Max Storage	100.10	32.53	54.24	67.65	95.29
	Deficit and Constant - Initial Deficit	28.86	6.94	13.20	20.58	25.27
	Deficit and Constant - Constant Rate	0.04	0.01	0.00	0.06	0.05
	Deficit and Constant - Maximum Deficit	133.16	65.98	61.33	133.06	101.74
	ModClark - Time of Concentration	3.02	1.38	1.27	2.80	2.02
	ModClark - Storage Coefficient	2.49	1.42	1.30	2.76	2.07
	Recession - Initial Discharge	17.07	11.21	10.65	20.09	15.88
	Recession - Recession Constant	0.66	0.06	0.03	0.87	0.42
	Recession - Ratio to Peak	0.98	0.22	0.23	1.00	0.51
R1 to R2	Lag - Lag	174.23	36.90	38.68	71.24	70.11
Outlet 5 to R2	Lag - Lag	130.81	32.59	34.39	58.30	66.94
R2	Simple Canopy - Initial Storage	8.41	2.53	2.69	4.65	5.38
	Simple Canopy - Max Storage	10.00	3.93	4.21	7.43	9.43
	Simple Surface - Initial Storage	29.43	12.53	13.55	24.46	29.19
	Simple Surface - Max Storage	110.98	39.16	42.74	78.23	97.08
	Deficit and Constant - Initial Deficit	29.33	9.54	10.09	18.45	21.86
	Deficit and Constant - Constant Rate	1.22	0.40	0.42	0.77	0.91
	Deficit and Constant - Maximum Deficit	127.55	47.75	48.73	77.98	92.31
	ModClark - Time of Concentration	3.08	1.16	1.19	1.77	1.94
	ModClark - Storage Coefficient	2.54	1.74	1.77	2.70	2.70
	Recession - Initial Discharge	14.99	11.94	12.11	17.04	16.35
	Recession - Recession Constant	0.21	0.21	0.22	0.50	0.41
	Recession - Ratio to Peak	0.60	0.58	0.59	0.72	0.64

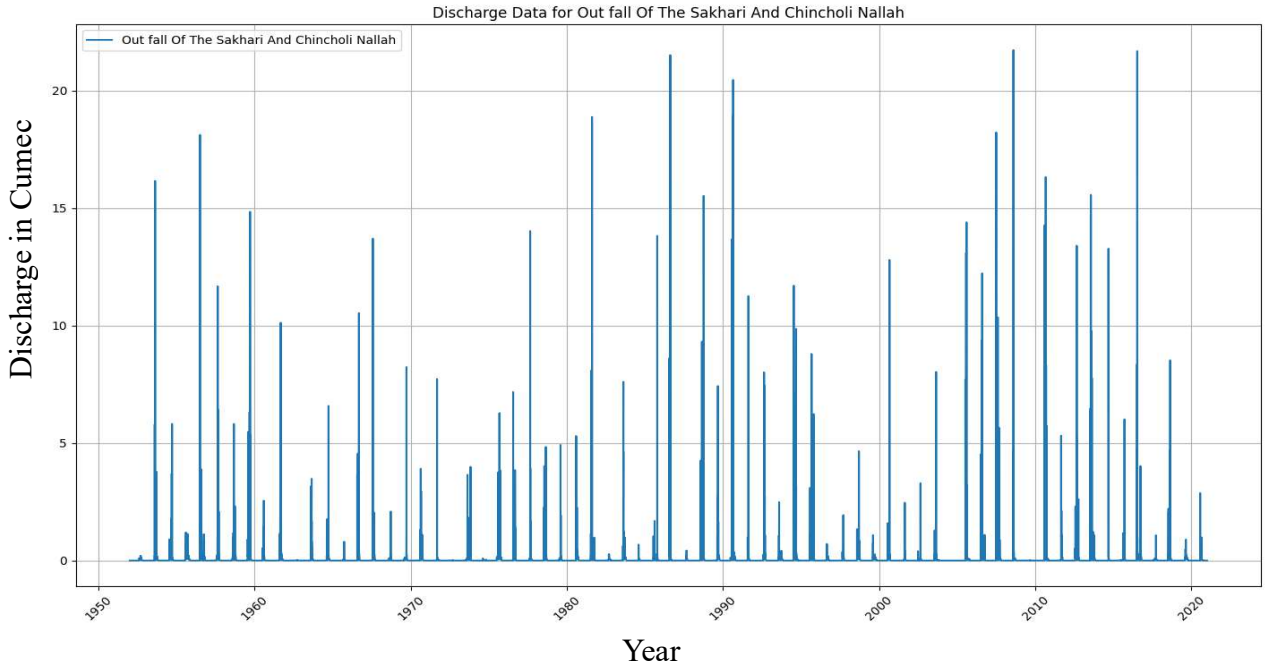
average NSE compared to parameter set 4. Consequently, parameter set 5 is selected as the optimal set for this study, as indicated in Table 7.2. During the validation period, the average NSE value for parameter set 5 exceeds 0.5, which is considered acceptable. Additionally, it is notable that the NSE values for 3 out of the 5 validation events surpass 0.65, reflecting a strong performance and confirming the reliability of the selected parameter set in simulating streamflow for the catchments.

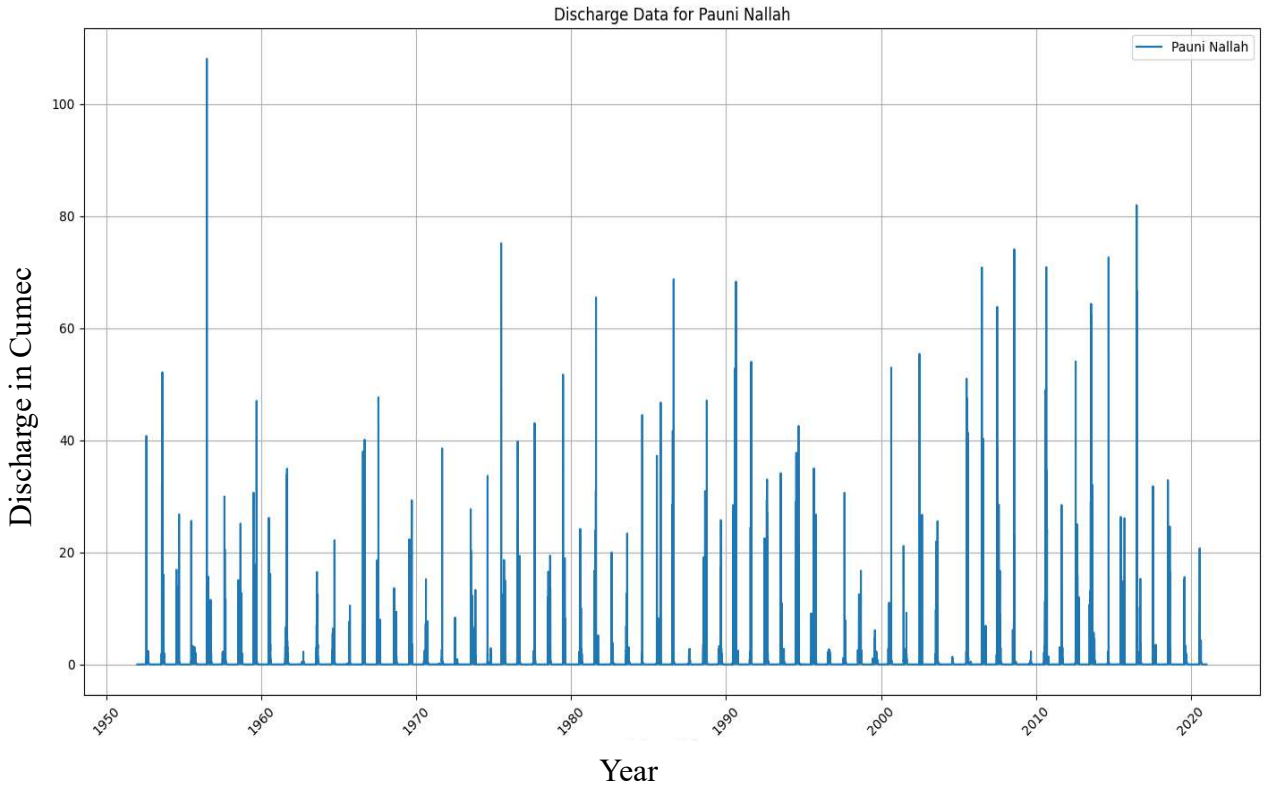
Table 7. 2 Calibration and Validation results of event-based modelling

	CALIBRATION						VALIDATION					
NSE	Event-1	Event-2	Event-3	Event-4	Event-5	Avg. NSE	Event-1	Event-2	Event-3	Event-4	Event-5	Avg. NSE
Parameter-1	0.923	0.892	0.809	0.923	0.682	**0.846**						
Parameter-2	0.901	0.917	0.835	0.923	0.66	**0.847**						
Parameter-3	0.901	0.917	0.835	0.923	0.661	**0.847**						
Parameter-4	0.904	0.911	0.827	0.924	0.673	**0.8478**	0.709	0.332	0.355	0.686	0.833	**0.583**
Parameter-5	0.904	0.911	0.826	0.924	0.677	**0.8484**	0.712	0.333	0.353	0.683	0.834	**0.583**

7.5.5 Estimation of Discharges for All Nallahs

The peak discharges for each nallah in the study area, as determined through HEC-HMS modeling, reveal considerable variability in flow magnitudes. Dhoptala Nallah has a substantial peak discharge of 463.20 cubic meters per second (cumecs), indicating its significant contribution to the overall hydrological system. In contrast, the Outfall of the Sakhari and Chincholi Nallah exhibits a much smaller peak discharge of 21.72 cumecs, suggesting that these nallahs contribute relatively minor flows. Pauni Nallah and Sakhari Nallah have moderate peak discharges of 108.07cumecs and 313.720 cumecs, respectively, indicating their intermediate role in the watershed. Chincholi Nallah has a peak discharge of 216.85 cumecs, while Gouri Nallah has a much higher peak discharge of 1150.38 cumecs, marking it as a significant watercourse in the area. The Wardha River, being the main river system in the region, exhibits an exceptionally high peak discharge of 29936.2 cumecs, highlighting its dominant influence on the hydrology of the entire area


Discharge Data for Out fall Of The Sakhari And Chincholi Nallah
Out fall Of The Sakhari And Chincholi Nallah
Discharge in Cumec
0
5
10
15
20
1950
1960
1970
1980
1990
2000
2010
2020
Year


Discharge Data for Pauni Nallah
Pauni Nallah
Discharge in Cumec
0
20
40
60
80
100
1950
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1970
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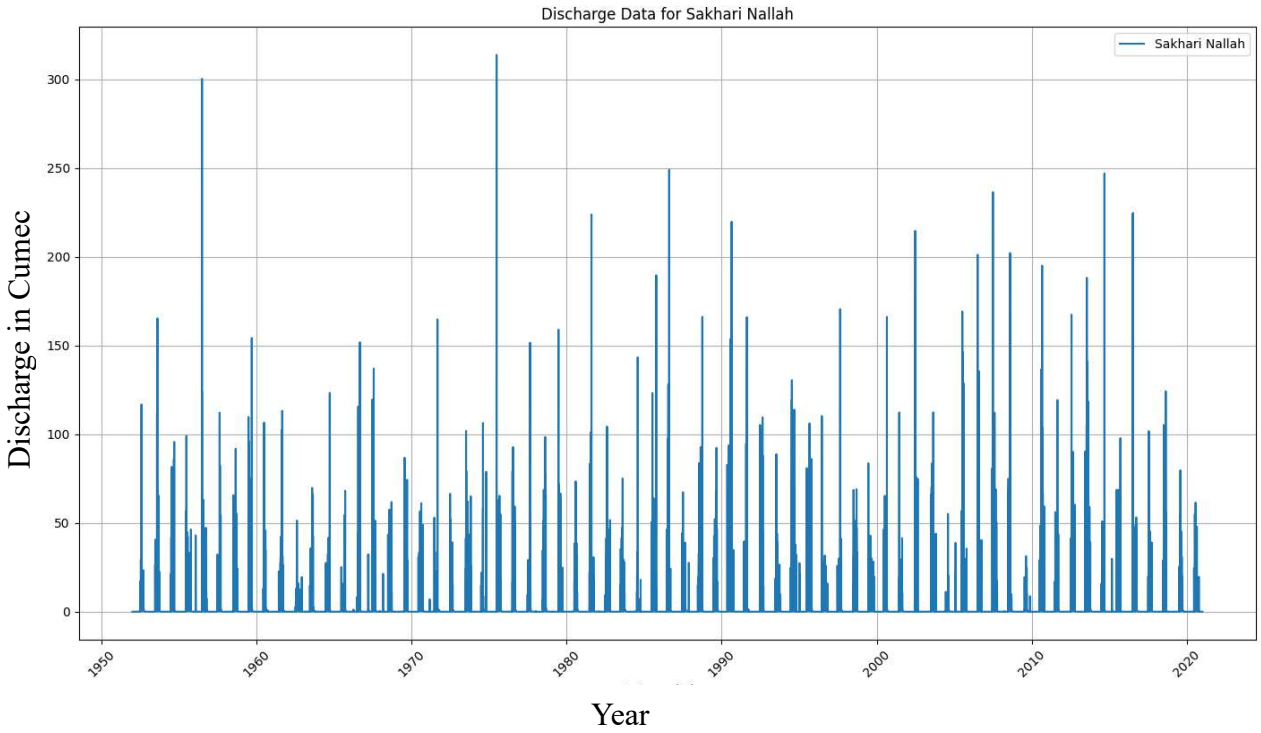
2020
Year


Discharge Data for Sakhari Nallah
Sakhari Nallah
Discharge in Cumec
0
50
100
150
200
250
300
1950
1960
1970
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1990
2000
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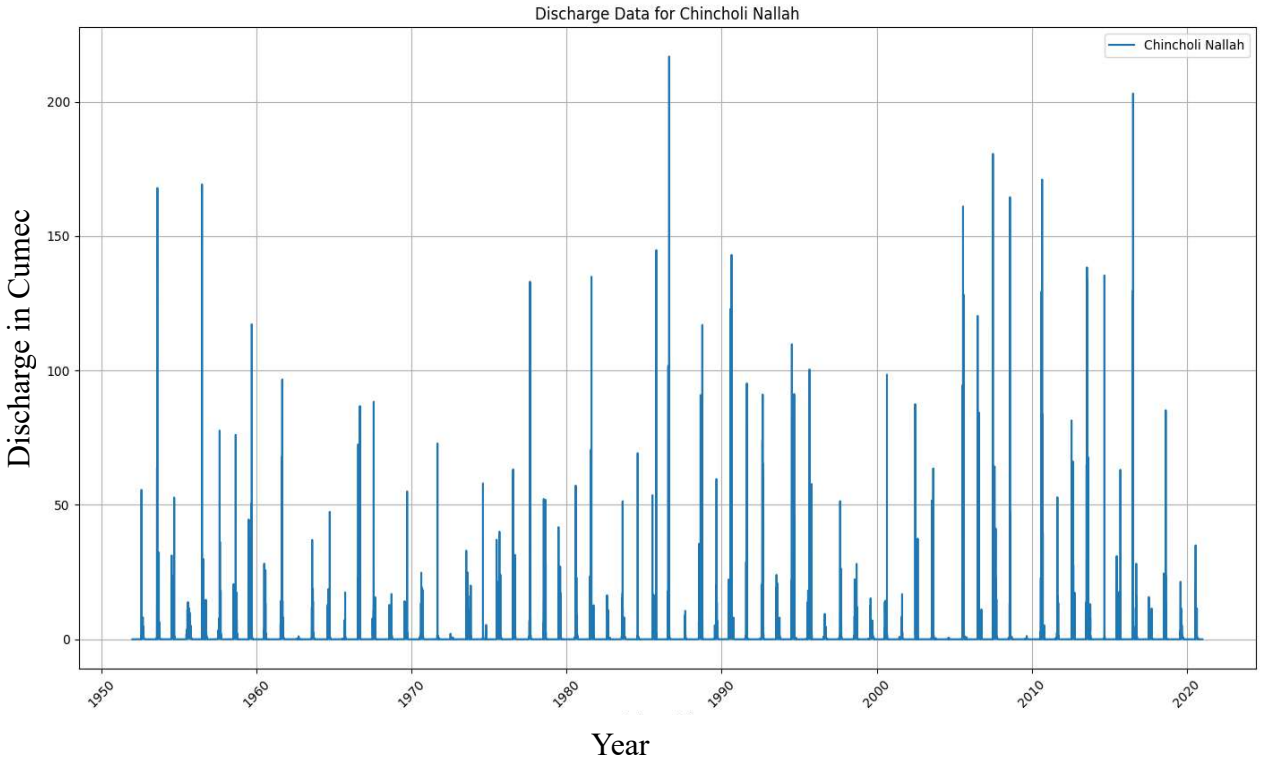
2020
Year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Chincholi Nallah
Discharge in Cumec
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100
150
200
1950
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2000
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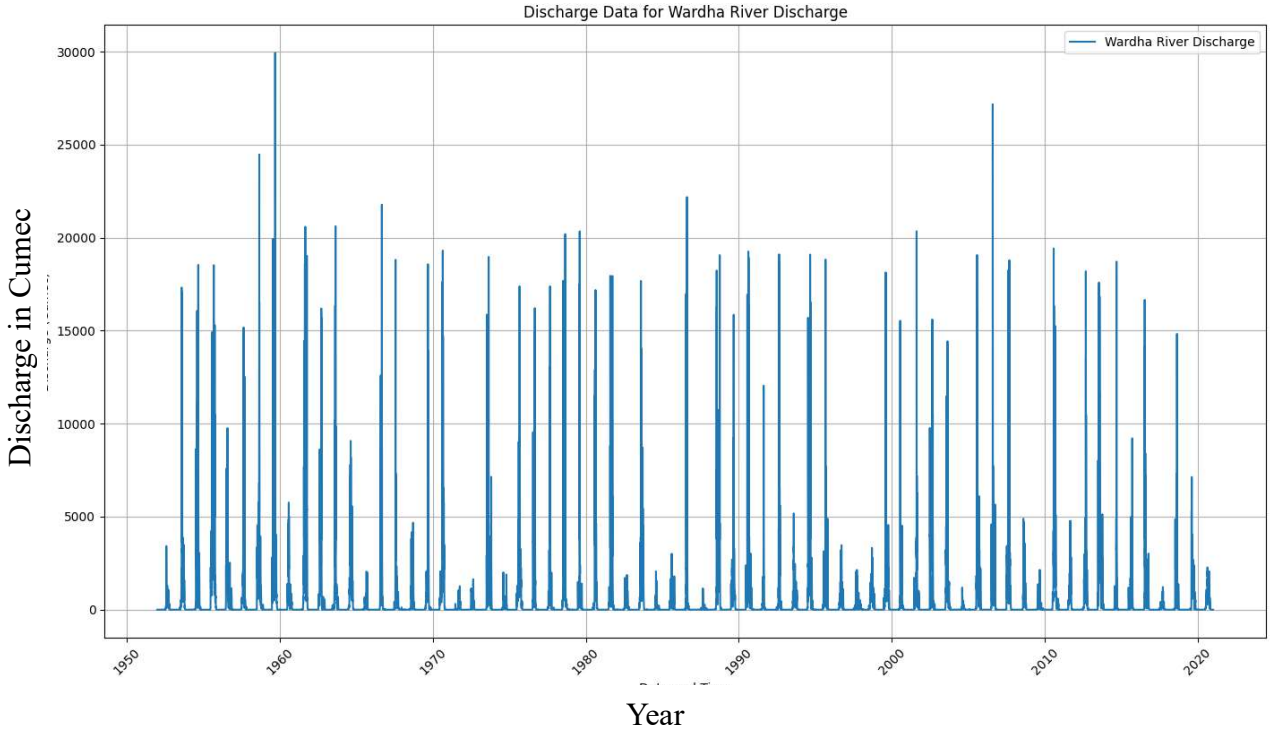
2020
Year


Discharge Data for Wardha River Discharge
Wardha River Discharge
Discharge in Cumec
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25000
20000
15000
10000
5000
0
1950
1960
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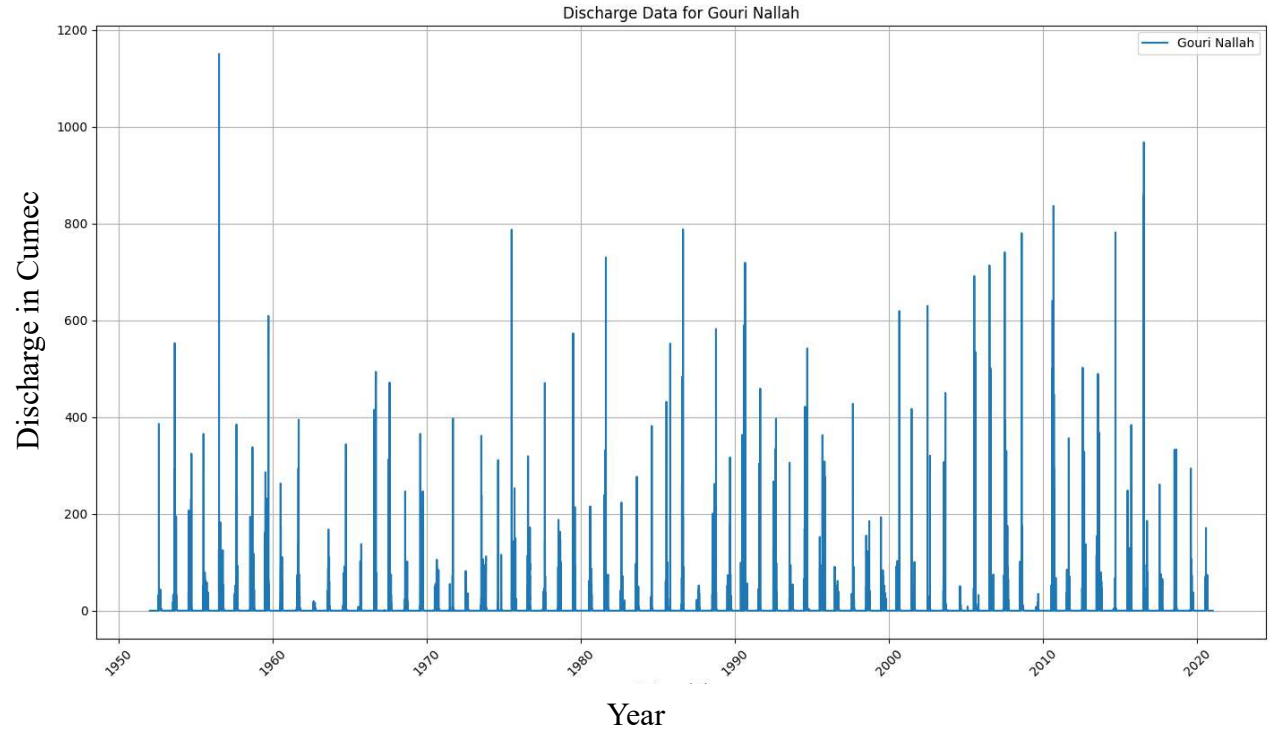
1990
2000
2010
2020
Year


Discharge Data for Gouri Nallah
Gouri Nallah
Discharge in Cumec
1200
1000
800
600
400
200
0
1950
1960
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1980
1990
2000
2010
2020
Year

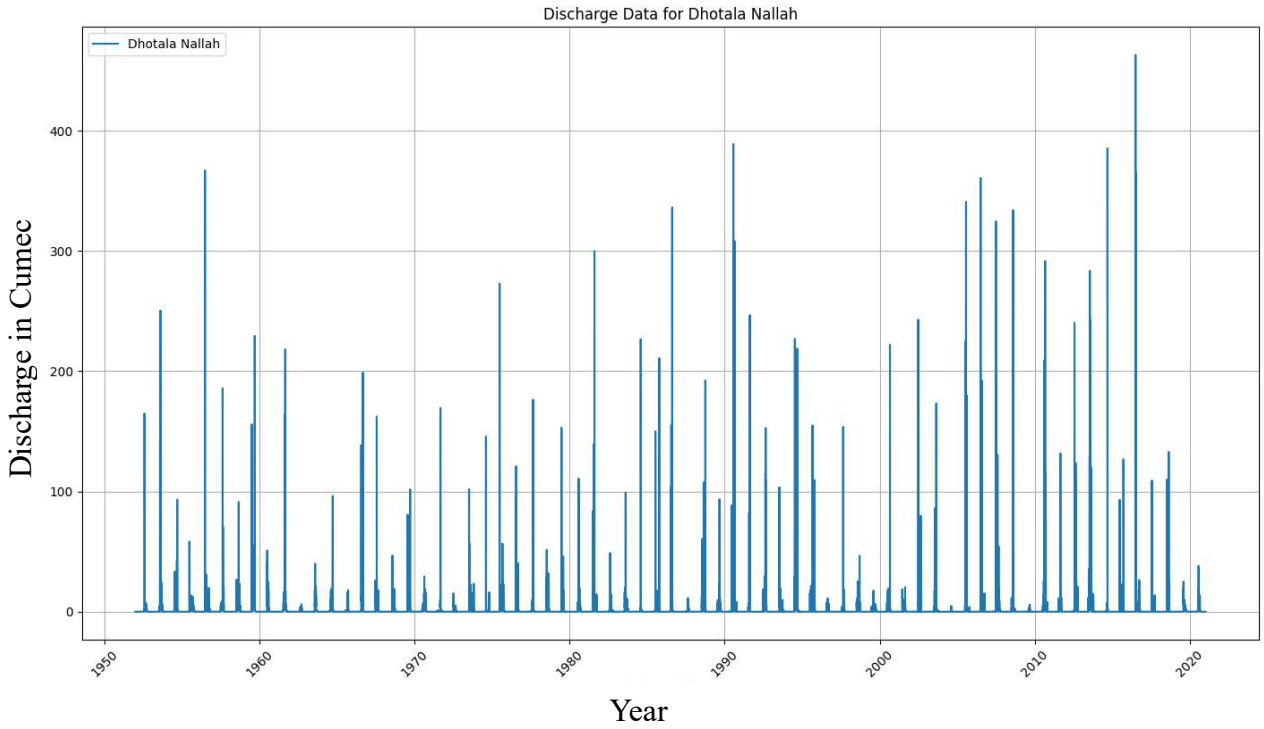

Figure 7. 10: Discharges at a) 'Outfall of the Sakhari and Chincholi Nallah', b) 'Pauni Nallah',c) 'Sakhari Nallah', d) 'Chincholi Nallah', e) 'Wardha River discharge', f) 'Gouri Nallah' g)Dhoptala Nallah

These peak discharge values are crucial for understanding the flood dynamics and potential impact on the surrounding areas, especially where the nallahs intersect with the Wardha River. Figure below shown are discharge predictions from 1952 to 2020.

CHAPTER 8: HYDRAULICS DESIGN OF DIVERSIONS

8.1 Introduction

In the context of hydrological studies and water resource management, analyzing flood discharge and determining return periods is crucial for designing infrastructure that can withstand extreme weather events. Return period analysis helps estimate the probability of a certain discharge occurring within a specific time frame, providing essential information for planning and designing hydraulic structures such as dams, bridges, and diversion channels. For this study, we conducted a return period analysis for several nallahs, including Dhoptala Nallah, Pauni Nallah, Sakhari Nallah, Chincholi Nallah, Gouri Nallah, and the Wardha River. Table 8.1 gives the flood frequency analysis of various Nallahs. The results of this analysis will guide the design of a trapezoidal cross-section at two critical diversions, using the 50-year return period as the basis for ensuring the infrastructure's resilience. In hydrology, the return period is a crucial concept that represents the average interval of time between events of a certain magnitude or greater. In our study, the return period analysis helps to estimate the design flood for different hydraulic structures, ensuring they can withstand extreme events. For instance, designing a structure to withstand a 50-year return period flood means that there is a 2% chance of a flood of that magnitude or greater occurring in any given year.

8.2 Introduction to Gumbel Type Return Period Analysis

The Gumbel distribution is widely used in hydrology and environmental engineering for analyzing the frequency of extreme events such as floods, droughts, and precipitation. The Gumbel distribution, specifically the Gumbel Type I distribution, is commonly applied to model the distribution of the maximum (or minimum) values of a dataset. In the context of flood analysis, it helps to predict the magnitude of a flood that can be expected to occur at a specific location for a given return period.

The Gumbel distribution's cumulative distribution function (CDF) is expressed as:

$$F(x) = exp(-exp(-(x - \mu)/\beta))$$

Where:

- x is the random variable (e.g., annual maximum flood discharge).

- μ is the location parameter.

- β is the scale parameter.

For flood frequency analysis, the Gumbel variate y is used, which is defined as:

$$y = (x - \mu)/\beta$$

The return period T can be related to the probability P as follows:

$$T = 1 / (1 - F(x))$$

Given the return period T, the Gumbel variate y_T can be calculated as:

$$y_T = -ln(-ln((T - 1)/T))$$

The corresponding discharge Q_T for the return period T is then:

$$Q_T = \mu + \beta * y_T$$

Table 8. 1 Flood Frequency of Dhoptala Nallah

i	Return period T (yr)	Probability P (percent)	Gumbel variate y	Flood discharge Q (m^3/s)
1	1.05	95.2	1.113	2
2	1.11	90.1	-0.838	25
3	1.25	80	-0.476	60
4	2	50	0.367	141
5	5	20	1.5	251
6	10	10	2.25	324
7	25	4	3.199	416
8	50	2	3.902	484
9	100	1	4.6	551
10	200	0.5	5.296	619

Table 8. 2 Flood Frequency of Pauni Nallah

i	Return period T (yr)	Probability P (percent)	Gumbel variate y	Flood discharge Q (m3/s)
1	1.05	95.2	-1.113	6
2	1.11	90.1	-0.838	11
3	1.25	80	-0.476	18
4	2	50	0.367	34
5	5	20	1.5	55
6	10	10	2.25	69
7	25	4	3.199	87
8	50	2	3.902	100
9	100	1	4.6	113
10	200	0.5	5.296	126

Table 8. 3 Flood Frequency of Sakhari Nallah

i	Return period T (yr)	Probability P (percent)	Gumbel variate y	Flood discharge Q (m^3/s)
1	1.05	95.2	-1.113	47
2	1.11	90.1	-0.838	61
3	1.25	80	-0.476	80
4	2	50	0.367	123
5	5	20	1.5	182
6	10	10	2.25	220
7	25	4	3.199	269
8	50	2	3.902	305
9	100	1	4.6	341
10	200	0.5	5.296	377

Table 8. 4 Flood Frequency of Chincholi Nallah

i	***Return period T (yr)***	***Probability P (percent)***	***Gumbel variate y***	***Flood discharge Q (m^3/s)***
1	1.05	95.2	-1.113	-2
2	1.11	90.1	-0.838	11
3	1.25	80	-0.476	27
4	2	50	0.367	66
5	5	20	1.5	119
6	10	10	2.25	153
7	25	4	3.199	197
8	50	2	3.902	229
9	100	1	4.6	262
10	200	0.5	5.296	294

Table 8. 5 Flood Frequency of Gouri Nallah

i	***Return period T (yr)***	***Probability P (percent)***	***Gumbel variate y***	***Flood discharge Q (m^3/s)***
1	1.05	95.2	-1.113	86
2	1.11	90.1	-0.838	141
3	1.25	80	-0.476	214
4	2	50	0.367	381
5	5	20	1.5	607
6	10	10	2.25	757
7	25	4	3.199	946
8	50	2	3.902	1086
9	100	1	4.6	1225
10	200	0.5	5.296	1364

Table 8. 6 Flood Frequency of Wardha River

i	Return period T (yr)	Probability P (percent)	Gumbel variate y	Flood discharge Q (m^3/s)
1	1.05	95.2	1.113	199
2	1.11	90.1	-0.838	1571
3	1.25	80	-0.476	3897
4	2	50	0.367	9309
5	5	20	1.5	16590
6	10	10	2.25	21411
7	25	4	3.199	27503
8	50	2	3.902	32022
9	100	1	4.6	36507
10	200	0.5	5.296	40977

The table 8 presents the 50-year and 100-year flood discharge values (in m^3/s) for various Nallahs (small streams) and the Wardha River. These values represent the expected floodwater volume for events that have different probabilities of occurring in any given year.

8.2.1 Explanation of Flood Probabilities

1. **Return Period (T)**:
    - The **50-year return period** flood means that the probability of such a flood occurring in any given year is 1 in 50, or 2%.
    - The **100-year return period** flood has a probability of 1 in 100, or 1% chance of occurring in any given year.
    - These return periods help in flood risk planning, showing how often a certain magnitude of flood is expected.
2. **Flood Probability**:
    - For **Dhoptala Nallah**, the probability of a 50-year flood with a discharge of 484 m^3/s happening in any given year is 2%. A more severe 100-year flood with a discharge of 551 m^3/s has a 1% chance of occurring each year.
    - **Pauni Nallah** has smaller discharges, with 100 m^3/s for the 50-year flood and 113 m^3/s for the 100-year flood, indicating a lower floodwater volume compared to other Nallahs.
    - **Sakhari Nallah** shows moderate flood discharges, with 305 m^3/s for the 50-year event and 341 m^3/s for the 100-year event.
    - **Chincholi Nallah** has similar behavior, with discharges of 229 m^3/s for the 50-year event and 262 m^3/s for the 100-year flood, reflecting typical smaller-scale stream discharges.

- **Gouri Nallah** shows significantly higher discharges, with 1086 m^3/s for the 50-year flood and 1225 m^3/s for the 100-year flood, suggesting a larger flood risk and water volume in this stream.
- Finally, the **Wardha River** has the highest flood discharge values, with 32,022 m^3/s for the 50-year flood and a massive 36,507 m^3/s for the 100-year flood, indicating a much larger flood event due to the river's size.

Key Points:

The hydrological behavior of the region's nallahs shows notable variation, with significant implications for flood management and planning. Smaller nallahs, such as Pauni, Sakhari, and Chincholi, typically exhibit relatively lower flood discharges compared to larger water bodies. While their flood events are often localized, they can still pose significant risks to agricultural fields, small settlements, and infrastructure within their immediate vicinity. These smaller streams may respond more quickly to intense rainfall due to their smaller catchment areas, making them prone to flash floods in certain conditions.

In contrast, larger nallahs like Gouri and the Wardha River display much higher flood discharges, reflecting their capacity to drain larger catchment areas and accommodate substantial water volumes during extreme rainfall events. Flooding in these larger systems is more likely to be widespread, impacting multiple villages, farmlands, and infrastructure over a broader area. The higher discharge volumes make these systems critical focal points for flood mitigation measures, as their flooding events could result in severe damage to life, property, and the local economy. Table 8.7 presents the results of the return period analysis for each nallah, summarizing the expected flood discharges for various return periods.

Table 8. 7 summarized results of Flood value for return period 50 and 100 year

Nallah/River	50-Year Flood Discharge Q (m^3/s)	100-Year Flood Discharge Q (m^3/s)
Dhoptala Nallah	484	551
Pauni Nallah	100	113
Sakhari Nallah	305	341
Chincholi Nallah	229	262
Gouri Nallah	1086	1225
Wardha River	32022	36507

Application in Design

For the specific design of trapezoidal cross-sections at Diversion 1 and Diversion 2, the 50-year return period flood discharge values for Gouri Nallah and Dhoptala Nallah will be utilized.

- **Diversion 1 (Gouri Nallah):** The design will be based on a flood discharge of 1225 m^3/s.
- **Diversion 2 (Dhoptala Nallah):** The design will be based on a flood discharge of 551 m^3/s.

These designs will ensure that the cross-sections can accommodate extreme flood events with a low probability of occurrence, thus safeguarding the infrastructure and surrounding areas from potential flood damage. By accommodating these extreme events, the designs play a crucial role in safeguarding the region's infrastructure, including roads, bridges, and mining facilities, from the devastating impacts of flooding. Canals can effectively handle extreme flood events even during the low probability of occurrences of flood.

8.3 Design of Diversions

Design of the Diversion are made based on the IS codes. There are mainly three IS codes are essential to design an unlined canal, The Indian Standards (IS codes) mentioned below are essential guidelines that provide specifications, methods, and recommendations for the design and construction of unlined canals for diversion works.

8.3.1 IS 7112: 2002 - Criteria for Design of Unlined Canals in Alluvial Soils

- **Purpose**: This standard provides guidelines for designing unlined canals in **alluvial soils**. Alluvial soils are generally found near rivers and streams, composed of fine particles like silt, clay, and sand, making them prone to erosion.
- **Relevance to Diversion Works**:
    - This code is crucial in determining the **hydraulic parameters** such as slope, cross-sectional dimensions, and side slopes for canals running through alluvial soils.
    - Rugosity Coefficient (n) also known as Manning's 'n' value for Unlined Canals are also given in Table 3.
    - Tractive force approach for design of unlined canals is recommended
    - It provides criteria for selecting a canal's **design velocity**, ensuring that the flow does not erode the canal bed and side slopes.
    - It emphasizes considerations for **scouring** and **sedimentation**, two critical aspects in designing canals in alluvial terrain.
    - The design ensures that the canal remains stable and durable without requiring expensive lining, which is critical for diversion works where the canal conveys water to storage or irrigation systems.

8.3.2 IS 5968: 1981 - Guidelines for Planning and Layout of Canal Systems for Irrigation

- **Purpose**: This code provides comprehensive guidelines for the **planning and layout** of canal systems for irrigation, including primary, secondary, and tertiary canals.

- **Relevance to Diversion Works**:
    - IS 5968 is important for planning the overall canal network, including the layout and alignment of the canal. It helps in deciding the location of **headworks**, **diversion structures**, and the **main canal** system.
    - It guides the design of **supply channels**, which divert water from a river or reservoir to the canal system.
    - This standard helps in determining the **water demand** and ensuring proper distribution through the canal system, which is crucial in diversion work to optimize water usage and reduce losses.
    - It also provides recommendations for **control structures**, such as regulators and falls, to manage the flow in the canal.

8.3.3 IS 10084 (Part I): 1982 - Design and Construction of Cross Drainage Works – General Requirements

- **Purpose**: This standard focuses on the design and construction of **cross-drainage structures**, which are essential where a canal intersects natural drainage paths such as rivers or streams.
- **Relevance to Diversion Works**:
    - In diversion projects, unlined canals often intersect with natural streams or drainage channels. IS 10084 provides guidelines for constructing cross-drainage structures, like **culverts**, **syphons**, or **aqueducts**, to allow the natural flow of water without disrupting the canal's operation.
    - Code recommends the design for 100 year frequency flood for the canal design.
    - It helps in designing structures that are **safe, stable, and durable** in alluvial regions, where high water tables and erosion can pose challenges.

- The code ensures that cross-drainage structures are adequately designed to handle expected **flood flows**, safeguarding the canal system and surrounding areas from water damage.

8.3.3.1 Design Philosophy of an Unlined Canal (Alluvium Unlined Canal)

When it comes to unlined canals, the design process for alluvial and non-alluvial soils is quite distinct from one another. It is possible to design unlined canals for alluvial soils with the assistance of Kennedy's Theory or Lacey's Theory. On the other hand, the coefficient of rugosity is an extremely important factor in the case of non-alluvial soils. During the process of designing an unlined canal for non-alluvial soil, Chezy's Equation, Manning's Equation, and Kutter's formula are commonly utilized.

These are fallowing designing steps needs to be fallowed while designing

1. Shape of the cross section of the canal.
2. Side slope of the canal.
3. Longitudinal bed slope.
4. Permissible velocities - Maximum and Minimum.
5. Roughness coefficient.
6. Free board.

8.3.3.2 Shape, side slopes of the cross section of the canal.

IS 7112:2002 recommends recommend specific shapes for canals to optimize hydraulic performance, construction efficiency, and maintenance. Among these, trapezoidal and rectangular shapes are commonly utilized based on site conditions and design requirements. The trapezoidal shape is particularly favored for unlined canals due to its efficient hydrodynamic properties.

Advantages: This shape provides a larger hydraulic radius relative to the cross-sectional area, which enhances flow capacity while minimizing erosion risks. The IS codes often specify side

slopes typically ranging from 1.5:1 to 2:1 (horizontal to vertical) for stability purposes, thus ensuring effective water conveyance and soil retention.

Supporting Standards: According to the IS: 7112-1973 code, the cross-section should be designed to maximize canal capacity while considering soil stability and maintenance accessibility.

Kennedy came up with a concept that he called critical velocity, which is defined as the mean velocity that will enable the channel to remain free from silting and scouring. The non-silting and non-scouring velocity, also known as the critical velocity, is represented by the symbol Vcr.

$$V_{cr} = 0.55mD^{0.64}$$

Where, D= depth of flow (m)

Vcr= critical velocity (m/s)

m= critical velocity ratio.

m= 1 (for upper bari doab region)

m>1 (for soil which is coarser than upper bari doab region)

m<1 (for soil which is finer than upper bari doab region)

from Vcr, first initial Depths can be assumed as

Table 8. 8 Criteria for initial Depth from the Vcr

Design Discharge Q (m3/s**)**	**First Trial depth (D)**
0-20	1
20-40	2
40-80	2.5
80-100	3
>100	3.5

Table 8. 9 Section design formula for the different side slopes (IS 7112:2002)

Design Parameter	Side Slope 1:1	Side Slope 1.5:1	Side Slope 1.25:1
Sectional Area (A)	$B \times D + 1.785 \times D^2$	$B \times D + 2.088 \times D^2$	$B \times D + 1.925 \times D^2$
Wetted Perimeter (P)	$B + 3.57 \times D$	$B + 4.176 \times D$	$B + 3.85 \times D$
Hydraulic Mean Radius (R)	$\frac{A}{P}$	$\frac{A}{P}$	$\frac{A}{P}$
Velocity (V)	$V = \frac{1}{n} \times R^{\frac{2}{3}} \times S^{\frac{1}{2}}$	-	-
Discharge (Q)	$A \times V$	-	-

Table 8. 10 suitable side slopes for channels built in various types of materials as described by Chow (1959)

Material	Side Slope
Rock	Nearly vertical
Muck and peat soils	1/4:1
Stiff clay or earth with concrete lining	1/2:1 to 1:1
Earth with stone lining or large channels	1:1
Firm clay or earth for small ditches	1 1/2:1
Loose, sandy earth	2:1
Sandy loam or porous clay	3:1

8.3.3.3 Longitudinal slope

The longitudinal slope of the channel is influenced by topography, the head required to carry the design flow, and the purpose of the channel. Generally, the slopes vary from 1 : 4000 to 1 : 20000 in canal. However, the longitudinal slopes in the natural river may be very steep (1/10). Chart 1 (Figure 8.3) is valuable in river engineering and irrigation canal design where the goal is to design stable channels that are self-maintaining (i.e., they neither erode excessively nor deposit too much

sediment). It helps designers balance the hydraulic parameters and choose appropriate slopes, grain sizes, and discharge capacities.

8.3.3.4 Permissible velocities - Maximum and Minimum.

One thing to keep in mind is that canals that transport water at higher speeds have the potential to scour the bed and the sides of the channel, which can ultimately result in the canal collapsing. On the other hand, when there are nutrients present in the water through the channel, weeds and plants are able to grow there.

It is for this reason that the minimum velocity that is allowed should not permit the growth of vegetation such as weeds. Furthermore, you should not allow the settlement of suspended material (non silting velocity). It is important for the designer to take into consideration these aspects before deciding on the minimum velocity that is acceptable.
On the other hand, the term "minimum permissible velocity" refers to the smallest velocity that will prevent both sedimentation and vegetative growth in general. When there is a low silt load in the flow, sedimentation can be avoided by maintaining an average velocity of between 0.60 and 0.90 meters per second. When it comes to preventing the growth of vegetation, a velocity of 0.75 meters per second is typically sufficient. Table 8.11 gives the guidelines for the maximum velocities in the canal. Table 8.12 gives the Mannings values.

8.3.3.5 Roughness coefficient.

The table 8.11 listing roughness coefficient, commonly referred to as Manning's n, is a critical parameter in hydraulic engineering, particularly for the design and analysis of open channels like canals. This coefficient quantifies the resistance offered by a channel's surface to the flow of water. Manning's n directly affects the velocity and discharge capacity of a canal, making it a crucial factor in determining its hydraulic efficiency. The table referenced provides Manning's n values for various types of earthen canals, categorized based on their physical condition, the extent and type of vegetation present, and the resulting flow resistance. For instance: By categorizing Manning's *n* values in the table, engineers can select appropriate roughness coefficients based on the observed or expected conditions of the canal.

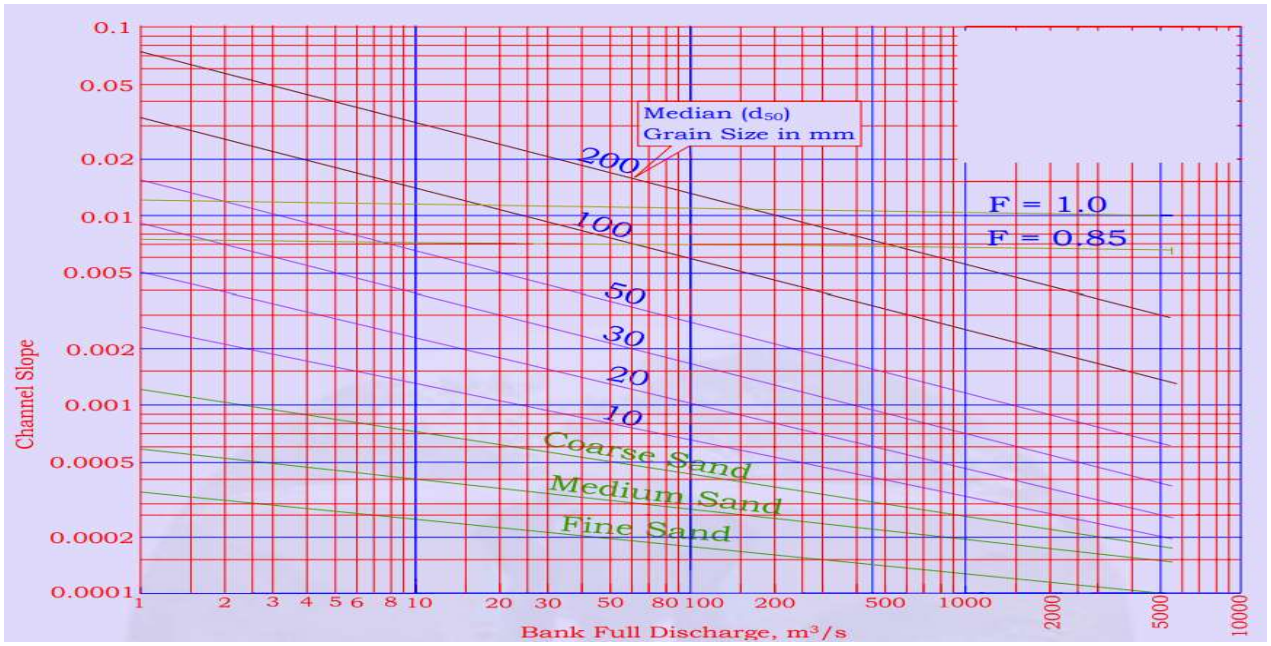

Figure 8. 1 Criteria for deciding the slope in alluvium canal (Source: Thandaveswara (2020): hamidomer.wordpress.com)

Table 8. 11 Guidelines for maximum velocities in canal

Material	Max Permissible Velocity (V) (m/s)	Manning's n Value
Fine sand	0.5	0.02
Sandy loam	0.58	0.02
Silt loam	0.67	0.02
Firm loam	0.83	0.02
Stiff clay	1.25	0.025
Fine gravel	0.83	0.02
Coarse gravel	1.33	0.025
Gravel	1.2	-
Disintegrated rock	1.5	-
Hard rock	4	-
Brick masonry with cement pointing	2.5	-
Brick masonry with cement plaster	4	-
Concrete	6	-
Steel lining	10	-

8.3.3.6 Free Board

The term freeboard refers to the vertical distance between either the top of the channel or the top of the channel is carrying the design flow at normal depth.

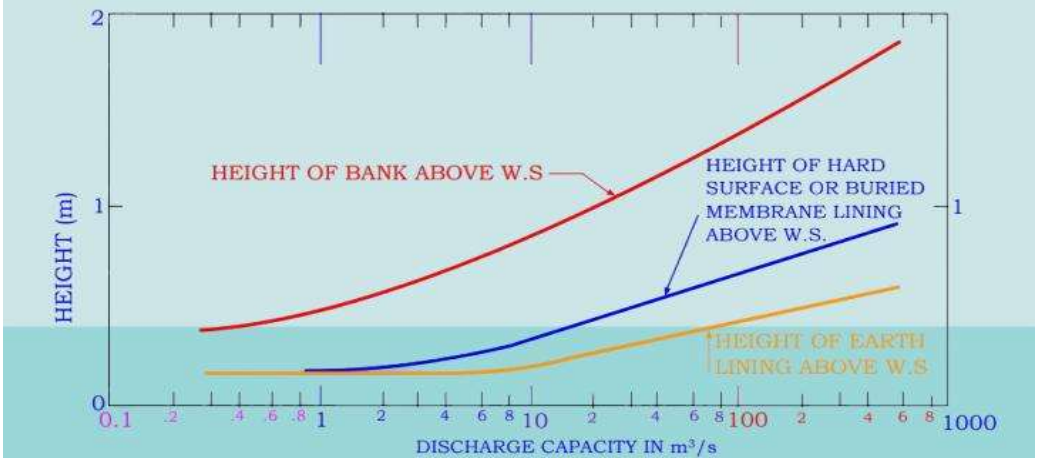

Figure 8. 2**:** Criteria for the deciding the Free Board(Source: USBR)

Table 8. 12 Guidelines for Manning's n values (Source: IS 7112:2002)

Type of Canal	Minimum n	Normal n	Maximum n
Earth, straight and uniform			
a) Clean, recently completed	0.016	0.018	0.020
b) Clean, after weathering	0.018	0.022	0.025
c) Gravel, uniform section, clean	0.022	0.025	0.030
d) With short grass, few weeds	0.022	0.027	0.033
Earth, winding and sluggish			
a) No vegetation	0.023	0.025	0.03
b) Grass, some weeds	0.025	0.03	0.033
c) Dense weeds or aquatic plants in deep channels	0.03	0.035	0.035
Earth bottom and rubble sides	0.03	0.035	0.04
Stony bottom and weedy banks	0.025	0.035	0.040
Cobble bottom and clean sides	0.035	0.04	0.05
Dragline excavated or dredged canals			
a) No vegetation	0.025	0.028	0.033
b) Light brush on banks	0.035	0.05	0.06
Channels not maintained (weeds and brush uncut)			
a) Dense weeds, as high as flow depth	0.05	0.08	0.12
b) Clean bottom, brush on sides	0.04	0.05	0.08
c) Same, highest stage of flow	0.045	0.07	0.11
d) Dense brush, high stage	0.08	0.10	0.14

The table 8.13 shows the recommended freeboard values for unlined and lined canals based on the discharge capacity (Q) in cubic meters per second (m^3/s).

Table 8. 13 Free board as per Indian Standards (IS 4745 - 1968), (IS 7112 - 1973)

Discharge Capacity (Q) (m^3/s)	***Freeboard (m) - Unlined Canals***	***Freeboard (m) - Lined Canals***
< 10.0	0.5	0.6
> 10.0	0.75	0.75

8.3.4 Design of Gouri Nallah

This Design outlines the design process for Gauri Nallah. The goal is to determine the required depth of the channel to handle a discharge of 1225 m^3/s. The Manning's roughness coefficient (n) is 0.025, the channel slope (S) is 0.0004, and the side slope (z) is 1.5 (1:1.5 slope).

Design Steps

1. Design Parameters:

Q = 1225; Design discharge in m^3/s

B = 60; Width of channel in meters

Z=1.5; Side Slope of Trapezoidal Channel

S = 1/2500; Bed slope

n = 0.025; Manning's roughness coefficient

K = 1.5; Bazin's constant for concrete (or other material)

$\mathbf{d_{mm}}$ = 0.025; % Mean particle size in mm

f = 1.76 * sqrt(dmm) =0.278; Silt factor based on Lacey's equation

$\mathbf{k_A = 2.088}$; % Constant for area calculation

$\mathbf{k_P = 4.176}$; % Constant for perimeter calculation

Initial guess for depth and tolerance

D = 3; % Initial depth guess in meters

Tolerance = 0.01; % Tolerance for discharge

Maximum iterations = 1000; % Maximum iterations.

Manning's Equation:

The Manning's equation is used to relate the discharge to the channel geometry and slope:

$$Q = \left(\frac{1}{n}\right) A R^{\frac{2}{3}} S^{\frac{1}{2}}$$

Where:

- A is the cross-sectional area; R is the hydraulic radius (R = A/P); P is the wetted perimeter

3. Cross-sectional Area and Wetted Perimeter:

- For a channel with width b and depth y:

$$A = b\ y + z\ y^2$$

- Wetted Perimeter:

$$P = b + 2\ y\ sqrt(1 + z^2)$$

4. Depth Calculation:

Results

Critical Velocity (Vcr): **1.7 m/s**

Manning Velocity: **2.92 m/s**

Bazin Velocity: **2.32 m/s**

Kutter Velocity: **2.77 m/s**

Lacey Velocity: **0.94 m/s**

Computed Depth (D**): 5.82 m**

Free Board= 0.5m

Final Depth (D**): 6.5 m**

Final Designed Discharge (Q): **1401.00 m^3/s > 1225 m^3/s (Accepted)**

Channel Width (B): **60.0 m**

Top width T**: 79.5m**

Bed Slope (S): **1/2500**

Manning's Roughness Coefficient (n): **0.020**

Bazin's Constant (K): **1.50**

Area: **453.38 m^2**

Wetted Perimeter: **83.44m**

Hydraulic Mean Radius**: 5m**

Froude number F: **0.4**

Type of Flow: **Subcritical Flow**

The Gauri Nallah has been designed in two distinct sections as given in Table 8.14, to efficiently manage varying discharges along its length before merging with the Wardha River downstream. In the first section, from chainage 0–1800 m, the channel is designed with a bottom width of 60 meters, a side slope of 1:1.5, and a depth of 7 meters to handle a discharge of 716 cumec. These dimensions provide a stable and hydraulically efficient cross-section for the smaller discharge. The side slopes ensure structural stability of the channel, reducing the risk of erosion and maintaining uniform flow along this stretch.

In the second section, from chainage 1801–12000 m, the channel transitions to a larger bottom width of 80 meters and a depth of 8.5 meters to accommodate a significantly higher discharge of 1400 cumec. The side slope of 1:1.5 is maintained to ensure consistency and stability across both sections. This design allows for the safe conveyance of larger volumes of water while minimizing the potential for overflow or structural failure. As the nallah approaches the Wardha River, the increased dimensions ensure a smooth transition of flow into the river system, thereby reducing downstream flooding risks. Longitudinal details of the designed Gauri Nallha is given in the Annexure 5.

Table 8. 14 Design Dimensions of Gauri Nallha

Chainage	Bottom Width in m	Discharge (Cumec)	Side Slope	Depth in m
0-1800	60	716	1.5	7
1801-12000	80	1400	1.5	8.5

8.3.5 Design of Dhoptala Nallah

Design of a trapezoidal channel for the Dhoptala Naala, which is required to carry a discharge of 550 cubic meters per second (cumec). The channel will be designed to function as an open channel flow with a slope of 0.0004. Given the environmental and flow conditions, a Manning's roughness coefficient (n) of 0.02 is assumed, which is typical for an earthen channel. The following steps illustrate the design process in detail. Longitudinal details of the designed Gauri nallha is given in the Annexure 6.

Q = 550; Design discharge in m^3/s

B = 40; Width of channel in meters

Z=1.5; Side Slope of Trapezoidal Channel

S = 1/2500; Bed slope

n = 0.02; Manning's roughness coefficient

K = 1.5; Bazin's constant for concrete (or other material)

$\mathbf{d_{mm}}$ = 0.025; % Mean particle size in mm

f = 1.76 * sqrt(dmm) =0.278; Silt factor based on Lacey's equation

$\mathbf{k_A = 2.088}$; % Constant for area calculation

k_P = 4.176; % Constant for perimeter calculation

Initial guess for depth and tolerance

Results

Critical Velocity (V_{cr}): 1.45 m/s

Manning Velocity: 2.44 m/s

Bazin Velocity: 1.92 m/s

Kutter Velocity: 2.36 m/s

Lacey Velocity: 0.82 m/s

Computed Depth (D): 4.54m

Free Board=0.5m

Final Depth (D): 5m

Final Designed Discharge (Q): 607.00 m^3/s >550 m^3/s (Accepted)

Top Width=55m

Channel Width (B): 40.00 m

Bed Slope (S): 1/2500

Manning's Roughness Coefficient (n): 0.02

Froude number F: 0.39

Type of Flow: Subcritical flow

Table 8. 15 Design Dimensions of Dhoptala Nallha

Chainage	Bottom Width in m	Discharge (Cumec)	Side Slope	Depth in m
0-End	40	607	1.5	5

CHAPTER 9: FLOOD MODELLING

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9.1 Introduction

The Ballarpur Sasti Mine, located in the Chandrapur district of Maharashtra, is a key open-cast coal mining operation that significantly impacts the local hydrology. Situated at geographical coordinates 19°49'8.45"N and 79°18'56.43"E, the mine is near the town of Ballarpur, a region where water management is critical due to the interplay between several small watercourses, known locally as nallahs, and the larger Wardha River. The drainage system in this region is complex, influenced by both natural and artificial modifications aimed at managing the water flow to prevent flooding and ensure the safe operation of the mine.

9.2 The Nallahs of the Sasti Mine Region

The natural drainage network of the Sasti Mine includes several nallahs that play a crucial role in managing water discharge, especially during the monsoon season when heavy rainfall can lead to flooding. The primary nallahs involved in this system are:

1. Sakhari Nallah
2. Pouni Nallah
3. Chincholi Nallah
4. Gouri Nallah
5. Dhoptala Nallah
6. Shivalan Nallah
7. Rajuara Nallah

These nallahs are not just important for the mine's water management but also for the surrounding environment and communities, as they eventually drain into the Wardha River. The Wardha River, a prominent tributary of the Godavari River, is a critical hydrological feature in the region, serving as a lifeline for both ecological and human activities. Its floodplain is an essential component of the river's natural dynamics, playing a pivotal role in flood management and supporting agricultural productivity.

9.2.1 Diversion 1: The Gouri Nallah Confluence

The first critical diversion in the study area is near Gouri Nallah, where the flood discharges of Sakhari Nallah, Pouni Nallah, and Chincholi Nallah converge. This area is particularly significant because the combined flow of these nallahs needs to be efficiently managed to prevent flooding downstream.

The combined flow from these three nallahs is directed into Gouri Nallah, which acts as the primary channel for conveying this water to the Wardha River. The diversion point is strategically located at coordinates 19°49'50.58"N, 79°20'9.21"E. The primary challenge in managing this diversion is to ensure that the flow from the nallahs does not exceed the capacity of Gouri Nallah, especially during peak discharge periods.

To address this, a trapezoidal channel design is often employed, which is effective in handling large volumes of water with minimal risk of overflow. The channel design must account for the peak discharge from all three nallahs, with careful consideration of the Manning's roughness coefficient (n) and the channel slope. The chosen n value reflects the channel's material and surface conditions, which in this case, is typically around 0.025 for an earthen channel.

9.2.2 Diversion 2: The Dhoptala Nallah Junction

The second significant diversion is located near Dhoptala Nallah. This diversion is critical as it involves the merging of flows from Shivalan Nallah and Dhoptala Nallah near Dhoptala Village. The combined discharge from these nallahs is then directed into the Wardha River, with the diversion point situated at coordinates 19°49'11.60"N, 79°21'10.71"E.

This diversion plays a crucial role in managing the flow from the upstream regions of the mine. During heavy rainfall, the combined discharge can be substantial, posing a risk of flooding both within the mine and in the downstream areas. The design of this diversion involves creating a channel capable of handling the combined peak discharges, which is again achieved through a trapezoidal channel design.

The design process for both diversions involves several steps, including the application of Manning's equation to determine the required channel dimensions. The equation takes into

account the discharge (Q), cross-sectional area (A), hydraulic radius (R), wetted perimeter (P), and channel slope (S). Iterative calculations are performed to find the optimal depth and width of the channel that can handle the peak discharges without causing overflow or structural failure.

9.2.3 Impact on the Wardha River Floodplain

The diversions not only affect the local nallahs but also have significant implications for the Wardha River's floodplain. The river's floodplain is a critical area that naturally manages excess water during periods of heavy rainfall. However, the introduction of artificial diversions can alter the flow patterns, potentially leading to increased flood risk in some areas while alleviating it in others.

The study aims to assess how these diversions impact the flood dynamics of the Wardha River, particularly during extreme weather events. The primary concern is whether the diversions will lead to higher water levels in the river, which could increase the risk of flooding in downstream communities. The analysis also considers the long-term effects on the floodplain, including potential changes in sediment deposition, erosion patterns, and the overall hydrological balance of the region.

9.2.3.1 Gouri Nallah Diversion (Diversion 1):

- **Flood Impact:** The area around Gouri Nallah appears to be heavily inundated, with deep blue regions indicating significant water depth. This suggests that the diversion at Gouri Nallah could be causing substantial flooding in the nearby areas.
- **Nearby Villages:** The villages upstream of this diversion point are likely to experience increased flood risk due to the concentrated flow being directed into Gouri Nallah. The image suggests that floodwaters might extend into agricultural lands or even residential areas, depending on the exact topography and local drainage capacity. However, upon closer evaluation during and after peak discharge events, no significant flooding was observed near the upstream villages. This suggests that the diversion system was well-designed and effectively managed the concentrated flow without causing adverse impacts on surrounding areas.

9.2.3.2 Dhoptala Nallah Diversion (Diversion 2):

- **Flood Impact:** The diversion at Dhoptala Nallah seems to have created a large inundation zone, indicating that the diverted flow is pooling or flowing more slowly in this region. The depth and extent of flooding suggest that nearby areas, including possibly villages or infrastructure, could be at risk of flood damage.

- **Nearby Villages:** The villages around Dhoptala Nallah might be facing a high flood risk, especially if the diversion has altered the natural flow paths and caused water to back up or spread out over a larger area. however there was no flooding observed near the village

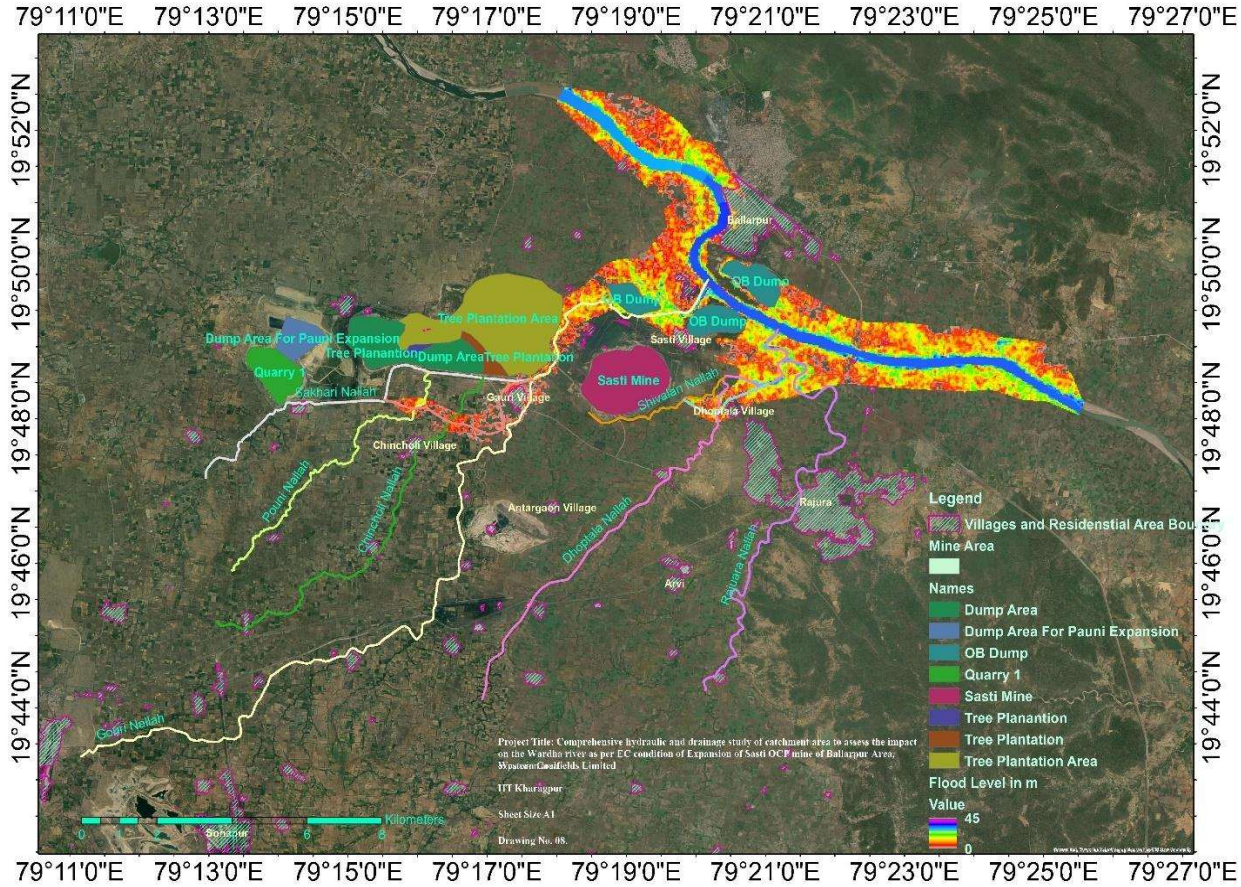

Figure 9. 1Flood Map of Diversions for 100 Year Flood

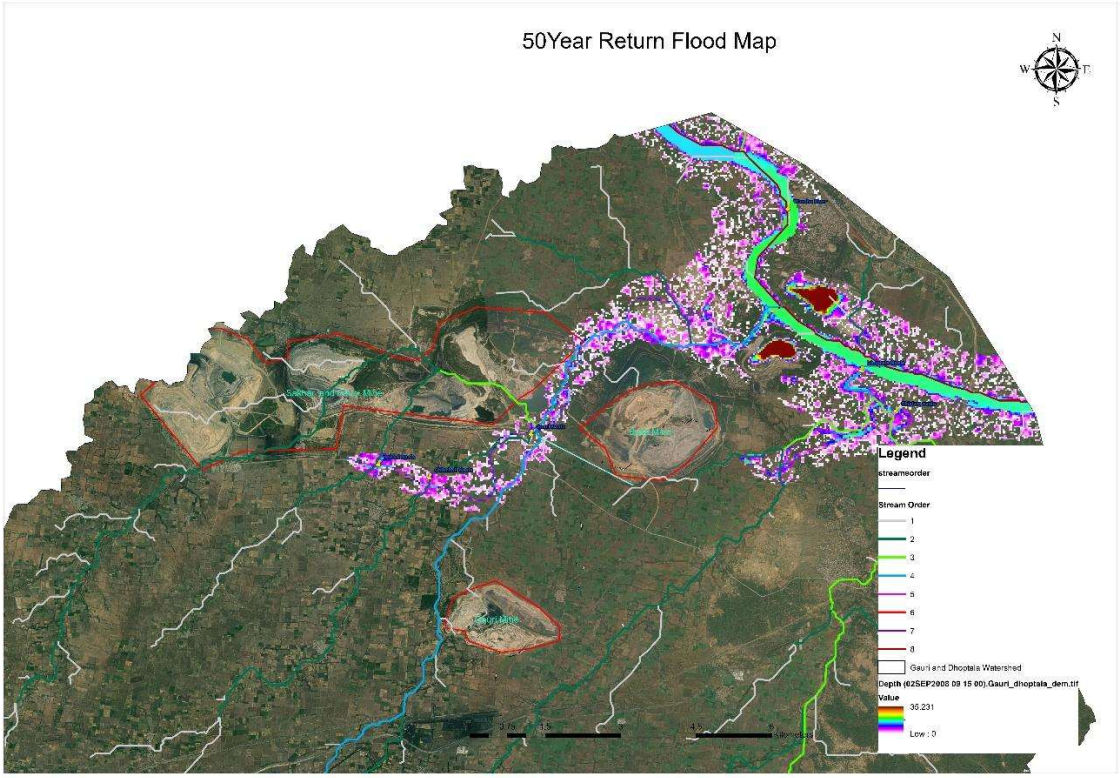

Figure 9. 2 Flood Map of Diversions for 50 Year Flood

9.3 Impact on Near by Villages

In the context of the present study, the focus is on two critical diversions, referred to as Diversion 1 near Gouri Nallah and Diversion 2 near Dhoptala Nallah. These diversions were engineered to manage the water flow from several nallahs converging in the region, redirecting their combined discharge into the Wardha River.

Impact of Gouri Diversion (Diversion 1): Located near Gouri Nallah, this diversion manages the flow from Sakhari Nallah, Pouni Nallah, and Chincholi Nallah. As observed in the figure, the floodplain around the area where these nallahs converge has been effectively controlled by the diversion. The flood impact appears to be confined to areas closer to the Wardha River, with the surrounding regions, including Gouri Village, showing no significant signs of flooding. This indicates that the diversion has successfully managed the floodwaters, preventing inundation in the nearby villages and protecting them from potential flood damage.

Impact of Dhoptala Diversion (Diversion 2): The Dhoptala Diversion, situated near Dhoptala Nallah, channels the combined flow of Shivalan Nallah and Dhoptala Nallah into the Wardha River. The figure also shows that the flood impact is primarily concentrated along the river's main channel, with minimal flooding extending towards Dhoptala Village. Similar to the Gouri Diversion, this suggests that the Dhoptala Diversion is effectively mitigating the flood risk, ensuring that the village remains safe from significant water encroachment.

General Observations: Overall, the flood inundation map reveals that both Diversion 1 and Diversion 2 are functioning as intended, directing water away from vulnerable areas and into the Wardha River. The darker blue areas, representing deeper floodwaters, are primarily confined to the river's course and its immediate surroundings. The lighter blue areas, indicating shallower inundation, are spread across the floodplain but do not seem to impact the villages directly.

The absence of flooding near Gouri Village and Dhoptala Village reinforces the effectiveness of these diversions in safeguarding local communities. The engineering interventions have successfully reduced the flood risk in these areas, ensuring that the natural and artificial drainage systems work in tandem to manage water flow and prevent potential flood hazards.

This outcome is crucial for the ongoing operations of the Ballarpur Sasti Mine and the safety of the surrounding settlements. By effectively managing the hydrological dynamics through strategic diversions, the study demonstrates a successful approach to mitigating flood risks in regions where natural watercourses interact with large-scale industrial activities.

9.4 Impact of Earthen Bund on nearby Field

An earthen bund has been constructed along Dhoptala Nallha, strategically positioned near Rajaura Nallha, which eventually merges with Dhoptala Nallha. This bund serves two crucial functions in flood management and water conservation. During extreme flood situations, it acts as a protective barrier, preventing floodwaters from spilling into nearby regions, thereby safeguarding agricultural fields and settlements. By controlling excessive runoff, the bund mitigates the risk of uncontrolled flooding, ensuring the stability of the drainage system during heavy rainfall events.

Additionally, the bund plays a vital role in groundwater recharge and peak flow regulation. During the monsoon season, it temporarily retains water from upstream catchments, slowing down the

rapid flow of rainwater into Dhoptala Nallha and nearby small streams. While not designed for long-term water storage, this temporary retention allows water to percolate into the ground, enhancing groundwater recharge and supporting local water availability. The delayed release of runoff also reduces peak flow intensity in smaller tributaries, minimizing erosion and sediment transport. Overall, the bund contributes positively to flood control, water conservation, and ecological balance, ensuring a more sustainable hydrological system in the region.

Chapter 10: Biodiversity Study: Nala Diversion at Sasti Mine

10.1 Introduction

The proposed area of Sasti Expansion OC is located at Near Sasti and Gauri villages, Rajpura Tehsil, Chandrapur district of Maharashtra. Chandrapur district is abundant in mineral resources. There are no National Parks, Wildlife Sanctuary, or Biosphere Reserves within a 10-kilometer radius of the project site. The Tadoba Andhari Tiger Reserve (TATR) is faraway to 14.5 kms which is the nearest eco-sensitive zone to the project area. The study area is entirely under the Southern tropical dry deciduous forests (Forest working plan, Chandrapur Forest Division), characterized by a seasonal shedding of leaves during the summer months. A brief reconnaissance survey was undertaken in May 2024, to investigate flora and fauna biodiversity and agriculture crops in the study area. There were two visits to the site: the first was pre-monsoon (May 2024), and the second was during monsoon season (July 2024).

There were two diversions in the study area: diversion 1 is Gouri *nala* which is close to agricultural activities and diversion 2 is Dhoptala *nala* which is close to agriculture as well as small forest.

10.2 Methodology

Study included mixed method approaches, including the review of secondary data sources and undertaking primary surveys. Survey techniques, such as standard transect walk and observational methods, were used. The study area included surrounding of expansion of Sasti OC. All the plant and animal species observed during the survey were later identified of family-wise, genus, and species distinctions was made (**Table 1, 2, 3 & 4**).

10.3 Flora

During the field survey, vegetation observed during the study included terrestrial plants (tree, shrub, herbaceous and grass) and aquatics plants in the both *nalas* (Diversion 1 – Gouri *nala* and Diversion 2 – Dhoptala *nala*). Families, genera and species, of all plants were identified based on their plant habits on the field and those that could not be identified on field were brought using available secondary data and Indian Biodiversity Portal (https://indiabiodiversity.org/).

10.4 Fauna

An avifaunal survey was undertaken by walking along the perimeter of the study area, and capturing photographs for species identification. The observation were carried out by using a field Olympus 10x50 DPSI binocular and capturing pictures via Nikon D5500 DSLR camera during the morning and in the evening at both *nalas* (Gouri *nala* and Dhoptala *nala*). Photos were further cross-referenced with bird identification including the Field guides of Indian birds (Ali, 2002; Kumar et al., 2005) and the Bird Field Guide (Grimmett et al., 1998) and websites such as iNaturalist, Indian Biodiversity Portal, and e-Bird.

10.5 Results

10.5.1 Flora

10.5.1.1 Trees

During study, there were different varieties tree species observed in the study area. The most dominant family was Fabaceae. The dominant tree species in the study area was Babool (*Vachellia nilotica),* Khair *(Acacia catechu) followed* by Karanj (*Pongomia pinnata)*, Shisham (*Dalbergia sissoo)* and Neem (*Azadirachta indica)* etc **(Table 10.1; Photoplate 1; Figure 10.1).**

Figure 10. 1 **Map of common tree species in the study area**

Table 10. 1Common Trees species present in the study area

Sr. No.	Common Name	Botanical Name	Family Name	IUCN Status
1.	Arjun	*Terminalia arjuna*	Combretaceae	NE
2.	Palash	*Butea monosperma*	Fabaceae	LC
3.	Babool	*Vachellia nilotica*	Fabaceae	LC
4.	Teak (Sagaun)	*Tectona grandis*	Lamiaceae	EN
5.	Jarul	*Lagerstroemia parviflora*	Lythraceae	LC
6.	Goolar	*Ficus racemosa*	Moraceae	LC
7.	Jamun	*Syzygium cumini*	Myrtaceae	LC
8.	Ber	*Ziziphus mauritiana*	Rhamnaceae	LC
9.	Haldu	*Haldina cordifolia*	Rubiaceae	NE
10.	Indian Bael	*Aegle marmelos*	Rutaceae	NT
11.	Neem	*Azadirachta indica*	Meliaceae	LC
12.	Mango	*Mangifera indica*	Anacardiaceae	DD
13.	Karanj	*Pongamia pinnata*	Fabaceae	LC
14.	Peepal	*Ficus religiosa*	Moraceae	LC
15.	Banyan	*Ficus benghaensis*	Moraceae	NE
16.	Indian Siris	*Albizia lebbeck*	Fabaceae	LC
17.	Imli	*Tamarindus indica*	Caesalpiniaceae	LC
18.	Shisham	*Dalbergia sissoo*	Fabaceae	LC
19.	Cassod or Siamese cassia	*Senna siamea*	Fabaceae	LC
20.	Khair	*Acacia catechu*	Fabaceae	LC
21.	Amaltas	*Cassia fistula*	Fabaceae	LC
22.	Almond	*Terminalia catappa*	Combretaceae	LC

Note: LC – Least concern, NE – Not Evaluated, NT – Near Threatened, EN – Endangered, DD – Data deficient

Neem (Pic 1)	Shisham (Pic 2)	Almond (Pic 3)
Babool (Pic 4)	Karanj (Pic 5)	Jamun (Pic 6)

Photoplate 1: Common tree species observed in the study area

10.5.1.2 Shrubs, Herbs and Grass

The study area is home to a variety of shrubs, herbs, and grasses that contribute significantly to the local ecology and biodiversity. Among the common species observed are Milkweeds (Calotropis gigantea), known for their hardy nature and adaptability to arid conditions, and Wild Sugarcane (Saccharum spontaneum), a grass species often found along riverbanks and in wetlands. These species are integral to the region's vegetation cover, providing food and habitat for a wide range of insects, birds, and small mammals. The detailed list of observed plant species is provided in Table 10.2, and their visual representation can be seen in Photoplate 2 and Figure 10.2. The region showcases a diverse assemblage of plant families, with the highest number of species represented by the Poaceae (grass family), which includes many essential grasses and fodder plants. This family is known for its ecological importance in stabilizing soil, preventing

erosion, and serving as a critical resource for grazing animals. Other notable families include Apocynaceae, to which *Calotropis gigantea* belongs, valued for its medicinal properties and resilience in challenging environments. This diversity underscores the richness of the local flora and its role in maintaining ecosystem balance.

Hariali Grass (Pic 1)

Milkweeds (Madar) (Pic 2)

Wild sugarcane (Pic 3)

Vilyati Tulsi (Pic 4)

Tridax daisy (Pic 5)

Wild Indigo (Pic 6)

Running grass (Pic 7)

Coffee senna (Pic 8)

Photoplate 2: Common shrubs, herbs and grass species observed in the study area

Figure 10. 2 **Map of common shrubs, herbs and grass species in the study area**
(Source: Google earth pro)

Table 10. 2 List of common Shrubs, Herbs and Grass species present in the study area

Sr. No.	Common Name	Botanical Name	Family Name
1	Congress Grass	*Parthenium hysterophorus*	Asteraceae
2	Lantana	*Lantana camara*	Verbenaceae
3	Wild sugarcane	*Saccharum spontaneum*	Poaceae
4	Milkweeds (Madar)	*Calotropis*	Apocynaceae
5	Pignut or Vilayti Tulsi	*Mesosphaerum suaveolens or Hyptis suaveole*	Lamiaceae
6	Tridax daisy	*Tridax procumbens*	Asteraceae
7	Wild Indigo	*Tephrosia purpurea*	Fabaceae
8	Coffee senna (Kasondi)	*Senna occidentalis*	Fabaceae
9	Sicklepod	*Senna obtusifolia*	Fabaceae
10	Hariali Grass	*Cyanodon dactylon*	Poaceae
11	Running Grass	*Brachiaria reptans*	Poaceae

10.5.2 Fauna

10.5.3 Mammals

The common mammalian species observed in the study area primarily included household livestock such as buffalo (Bubalus bubalis) and cows (Bos primigenius), as well as stray or pet animals like dogs (Canis lupus familiaris), as detailed in Table 10.3 and depicted in Photoplate 3. These animals play an integral role in the daily livelihoods of the local communities and are central to the region's agricultural economy. Livestock such as buffaloes and cows serve as a source of milk, manure, and draft power for agricultural operations, forming an essential part of rural farming systems. Dogs, on the other hand, are not only companions but also assist in safeguarding livestock and properties.

Grazing animals, including livestock, are vital components of both natural ecosystems and agricultural landscapes. Their grazing activities help regulate vegetation growth, which in turn prevents overgrowth and supports ecological balance. For instance, grazing controls invasive plant species, ensuring that native flora thrives and biodiversity is maintained. Furthermore, as these animals move and graze, they contribute to soil health by aerating the soil with their hooves and facilitating the natural recycling of nutrients through their manure. This organic matter improves soil fertility and enhances its capacity to retain moisture, thereby supporting crop growth in agricultural systems.

In addition to their ecological contributions, grazing animals also foster habitats for other wildlife species. The grazing patterns of livestock can create microhabitats for ground-nesting birds and insects, which rely on open, low-vegetation areas. Moreover, these animals often contribute to seed dispersal, aiding in the propagation of various plant species across the landscape. As such, their presence not only benefits the local agriculture but also promotes biodiversity, playing a crucial role in maintaining the interconnectedness of natural and human-modified ecosystems. Recognizing the importance of these animals, sustainable grazing practices should be encouraged to optimize their ecological and agricultural contributions while minimizing potential overgrazing and habitat degradation.

Table 10. 3 List of common mammals species present in the study area

Sr. No.	Common Name	Zoological Name	Family Name	IUCN Status
1	Dog	*Canis lupus familiaris*	Canidae	NE
2	Buffalo	*Bubalus bubalis*	Bovidae	NE
3	Cow	*Bos primigenius*	Bovidae	LC
4	Squirrel	*Funambulus palmarum*	Sciuridae	LC

Note: LC – Least concern, NE – Not Evaluated

Indian Dog

Cow

Buffalo

Squirrel

Photoplate 3: Common mammal's species observed in the study are

10.5.4 Avifaunal

The common avifanual species observed in the study area were Red wattled Lapwing (*Vanellus indicus*), Cattle Egret (*Bubulcus ibis*), Common Myna (*Acridotheres tristis*) and Green Bee Eater (*Merops orientalis*) **(Table 10.4, Photoplate 4, Figure 3)**.

Pond Heron (Pic 1)	Little Egret (Pic 2)
Red Wattled Lapwing (Pic 3)	Cattle Egret (Pic 4)
Black Drongo (Pic 5)	Laughing Dove (Pic 6)

Green Bee Eater (Pic 7)

Common Myna (Pic 8)

Photoplate 4: Common avifaunal species observed in the study area

Figure 10. 3 **Map of common shrubs, herbs and grass species in the study area**
(Source: Google earth pro)

Table 10. 4 List of common birds species present in the study area

Sr. No.	Common Name	Zoological Name	Family Name	IUCN Status
1	Peacock	*Pavo cristatus*	Phasianidae	LC
2	Sunbird	*Cinnyris asiaticus*	Nectariniidae	LC
3	Laughing Dove	*Spilopelia chinensis*	Columbidae	LC
4	Indian magpie	*Copsychus saularis*	Muscicapidae	LC
5	White breasted Kingfisher	*Halcyon smyrnensis*	Alcedinidae	LC
6	Green Bee Eater	*Merops orientalis*	Meropidae	LC
7	Coucal	*Centropus sinensis*	Cuculidae	LC
8	Indian Robin	*Saxicoloides fulicatus*	Muscicapidae	LC
9	Spotted Dove	*Spilopelia chinensis*	Columbidae	LC
10	Red wattled Lapwing	*Vanellus indicus*	Charadriidae	LC
11	Pond Heron	*Ardeola grayii*	Ardeidae	LC
12	Sriated Heron (Little Heron)	*Butorides striata*	Ardeidae	LC
13	Little Cormorant	*Microcarbo niger*	Phalacrocoracidae	LC
14	Cattle Egret	*Bubulcus ibis*	Ardeidae	LC
15	Little Egret	*Egretta garzetta*	Ardeidae	LC
16	Common Myna	*Acridotheres tristis*	Sturnidae	LC
17	Black Drongo	*Dicrurus adsimillis*	Dicruridae	NE
18	Koel	*Eudynamys scolopacea*	Cuculidae	LC
19	Sparrow	*Passer domesticus*	Passeridae	LC
20	Ashy Prinia	*Prinia socialis*	Cisticolidae	LC

Note: LC – Least concern, NE – Not Evaluate

10.5.5 Aquatic species:

In and around the *nalas*, aquatic plant species mostly invasive in nature were observed. Fish are found in Wardha river but no fish was reported in any *nalas* during the survey or any *nalas* which will be diverted. There will be short impact on aquatic biodiversity due to the diversion of the *nalas*, and it may take some time for species to get adapted to diversion, however after a certain period aquatic species of the nala will take the character of the river providing and supporting water to the river.

10.6 Agriculture:

There are many villages around the proposed land area for the project such as Sasti, Dhupatla, Kolgaon, Charlie, Babapur, Manoli, Pauni, Sakhari, Chincholi, Gowry, Goygaon, Antarvgaon, Muthara that practicefarming of agriculture crops. This region is primarily characterized by agricultural land featuring black cotton soil. Consequently, the region produces an array of suitable agricultural products, including cotton (*Gossypium hirsutum)*, gram (*Cicer arietinum*), sorghum (*Sorghum bicolor*), maize (*Zea mays*), and soybeans (*Glycine max*). Additionally, fodder crops (Napier grass, Berseem) are grown to provide feed for livestock. The majority of these crops are cultivated during the rainy season, while the fields often remain fallow during the other seasons (**Photoplate 5, Figure 10.4**).

Figure 10. 4 **Map of Agriculture fields in the study area** *(Source: Google earth pro)*

Pic 1

Pic 2

Pic 3

Pic 4

Pic 5

Pic 6

Photoplate 5: Agricultural fields observed in the study area

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The second field study was done in the month of July, 2024 during the monsoon season and it was observed out that *nalas* are filled and nearby agriculture field use this water for irrigation. The *nalas* here were mostly in dry condition, but during the rainy season large volume of water flows in the *nalas* and has a confluence with the Wardha river. (**Photoplate 6 A & B**).

(A)

(B)

Photoplate 6: *Nalas* to be diverted which is very less amount of water in summer season (March – May) represent in (A) whereas water availability is more during rainy season (Mid June - September) represent in (B)

It was observed that during high rainfall days, there is overflow in *nalas*, with a scenario of crop getting damaged. Due to the diversion of the *nalas*, back water entering agriculture field may damage the crops and fields.

10.7 Wildlife Corridors

During the field visit, evidence of wildlife movement was observed in the form of signs such as tracks, scat, and other markings typically left by wild animals in their natural habitats. These signs indicate that wild animals are likely utilizing areas near the site for movement, possibly as part of larger migratory or local patterns. This observation highlights the presence of wildlife corridors or pathways that may connect nearby forested regions or water sources. Such movements are

essential for the survival of many species, providing access to feeding, breeding, and roosting grounds, and are crucial for maintaining biodiversity in the region. The observed signs of wildlife activity are documented in Photoplate 7. As per the local people interactions and observation during the study period it was observed that there was little to no movement of the animals along this corridor.

Photoplate 7: Wildlife road signs board installed some places in study area (Rajpura to Gouri village on roadside)

10.8 Impact Prediction

The *nalas* supports a habitat that includes a variety of flora and fauna including various avifaunal and mammal species. Presently, these *nalas* flow near the proposed expansion of the coal mine, around where diverse avifaunal and other species can be found based on detailed survey during the monsoon and post monsoon. The change in water flow resulting from the *nalas* diversion may have short term impact on faunal and other migratory species that rely on the *nalas* for feeding,

breeding and roosting. Indirect impacts may include decreased water availability during dry seasons especially to herbivores close to these areas if they are using for water requirements and increase in water and submergence of certain areas during the monsoon season. Some probable impacts on wildlife resulting from the diversion of a both the *nalas* are assumed to be:

- Change in habitat quality due to alterations in water availability, on roosting, breeding, and feeding behavior of birds may happen but this needs to can be confimed by undertaking *nalas* diversion situation.
- Changes in aquatic macrophytes, phytoplankton and zooplankton can be ascertained based on separate studies by assessing pre and post diversion scenarios. However, based on the field observations it seems the diverted *nala* will take the character of the main water source of the *nala* in a short span of time.

Impacts of diversion 1 – Gouri *nala*

- Changes in agriculture productivity in case *nala* water is used in local irrigation practices and also submergence during the water abundance.
- Temporary disturbances to the natural environment may occur due to construction and realignment of nallahs.
- These disturbances could affect nearby flora and fauna, especially species dependent on nallahs for feeding, breeding, or roosting.
- There may be some short-term effects during the initial expansion; however, no significant long-term effects are expected, although they should be taken into account (like roosting, breeding, and feeding behavior of birds)

Impacts of diversion 2 – Dhoptala *nala*

- Changes in agriculture productivity in case *nalas* water is used in local irrigation practices and also submergence during the water abundance.

The diversion of *nalas* may have certain impact on the local biodiversity of plants and animals as mentioned in **Table 10.5**. Wildlife behaviors such as roosting, breeding, and feeding may temporarily shift but are anticipated to stabilize as the diverted nallahs regain natural flow characteristics.

Table 10. 5 Impacts on the local biodiversity of plants and animals

Project Phase	Impacts
Pre – phase	**Habitat Disruption:** Diversion of the *nalas* path may result in disturbance to species due to movement if heavy vehicle movement. This will also disturb the habitats along *nalas* banks.
Post - phase	**Loss of vegetation:** The alteration in water flow might lead to the loss of vegetation along the original course of the *nalas*, also local wildlife that depends on these greens spaces for roosting, breeding, and feeding. **Long-term Ecological Consequences:** The full extent of the ecological impacts of diverting the *nalas* may not be immediately apparent and could manifest over the long term, necessitating regular monitoring for designing adaptive management strategies and reducing the risks and losses.

10.9 Mitigation measures

In the diversion we observed short term impact on biodiversity that can be reversed if suggested plan is mainstreamed and implemented. Regarding the habit preferences, most of the observed species of flora and fauna are able to adapt to the habitat modification for their resource requirements that can be met by the existing environment if major changes do not transform the existing landscape, impact are listed in Table 10.6. We propose following recommendations that can be considered during the developmental plan:

- It is proposed that the diversion of nalas should be strategically positioned to minimize disruption to the aquatic environment, fostering a harmonious coexistence with the aquatic ecosystem.
- **Habitat preservation:** Ensure that the diversion plan minimizes disruption to critical habitats.
- **Mitigation strategies:** Develop strategies to mitigate potential negative impacts on biodiversity. This could include habitat restoration, and other conservation actions.

Table 10. 6 Potential Impacts on the local biodiversity

Sr. no.	Objectives	Potential impacts
1	Habitat loss of animals	The diversion of a *nalas* may affect natural habitats, particularly species that depend on the *nalas* for their water, food, and shelter needs like. More field based will be required to ascertain the details of species.
2	Displacement	Species reliant on the original path of the *nalas* may migrate to alternative areas, and result resource competition within those new habitats. More field based will be required to ascertain the details of these species.
3	Alterations in flora species	Changes in hydrology can influence the composition of macrophytes, phtoplanktons, zooplanktons and benthic communities inside the nalas as well as species growing along the *nalas*. This may also enhance invasion of species in modified *nalas* and riparian scapes. More field based will be required to ascertain the details of species.
4	Changes in behavioral aspects	There might be some short term changes in animal behavior dwelling nearby due to changes at the landscape level. This may include changes in migration routes and feeding behaviors, due to altered environmental conditions. More field based will be required to ascertain the details of species.

- **Stakeholder engagement:** Involve local communities, conservationists and other stakeholders in the planning process to gather diverse perspectives and support for biodiversity conservation.
- **Plantation of local native tree species:** To promote biodiversity through tree plantations, selecting native tree species is crucial. Native trees {Shisam (*Dalbergia sisoo*), Karanj (*Pongamia pinnata*), Palas (*Butea monosperma*), Khair (*Acacia catechu*) etc.} are adapted

to the local environment and support the local ecosystem by providing habitat and food for a variety of wildlife.

- **Encouraging the growth of grass:** Plant soil-binding grasses like Khus and Vetiver to prevent soil erosion. These grasses are essential for protecting the soil by holding it in place and preventing it from washing away.
- **Dust resistant tree:** The Ballarpur area is impacted by air pollution due to coal mining activities. To help mitigate this, it's recommended to plant dust-resistant trees such as Haldu, Amba (*Mangifera indica*), Chinch/Imli (*Tamarindus indica*) and Shisam (*Dalbergia sisoo*)} which can thrive in such environments and contribute to cleaner air.
- **Future aspects:** Highlight the critical need for regular monitoring of aquatic species and other biodiversity, a strong call is made for continuous efforts in studying the biodiversity to enable inform decision-making. Conservation of flora and fauna is essential to maintain the ecological balance. Here, primary mitigation measures and some action plans are mentioned in **(Table 10.6. A & 6. B)**.

Table 10. 7 Mitigation measures of impacts due to diversion of *nalas*

Project Phase	Potentials impacts	Mitigation measures
Construction Phase	Disturbance of fauna (such as aquatic birds such as Red Wattled lapwing, pond heron and Egret) breeding site (egg laying places) by human activities and vehicular movement.	• As per the protocol, designated parking zones will be strictly allocated for all machinery, trucks, and equipment, ensuring their confinement within these specified areas. • Regulating light, noise, water, dust and air pollution during the operation phase that may disturb the feeding, roosting and breeding of birds as well as other aquatic species. • Changes in aquatic biodiversity of the *nalas* should be monitored during the construction period.
Operation Phase	The number of migratory birds may decrease during the period	• Regulating light, noise, water, dust and air pollution during the operation phase.

Table 10. 8 Biodiversity Action plan

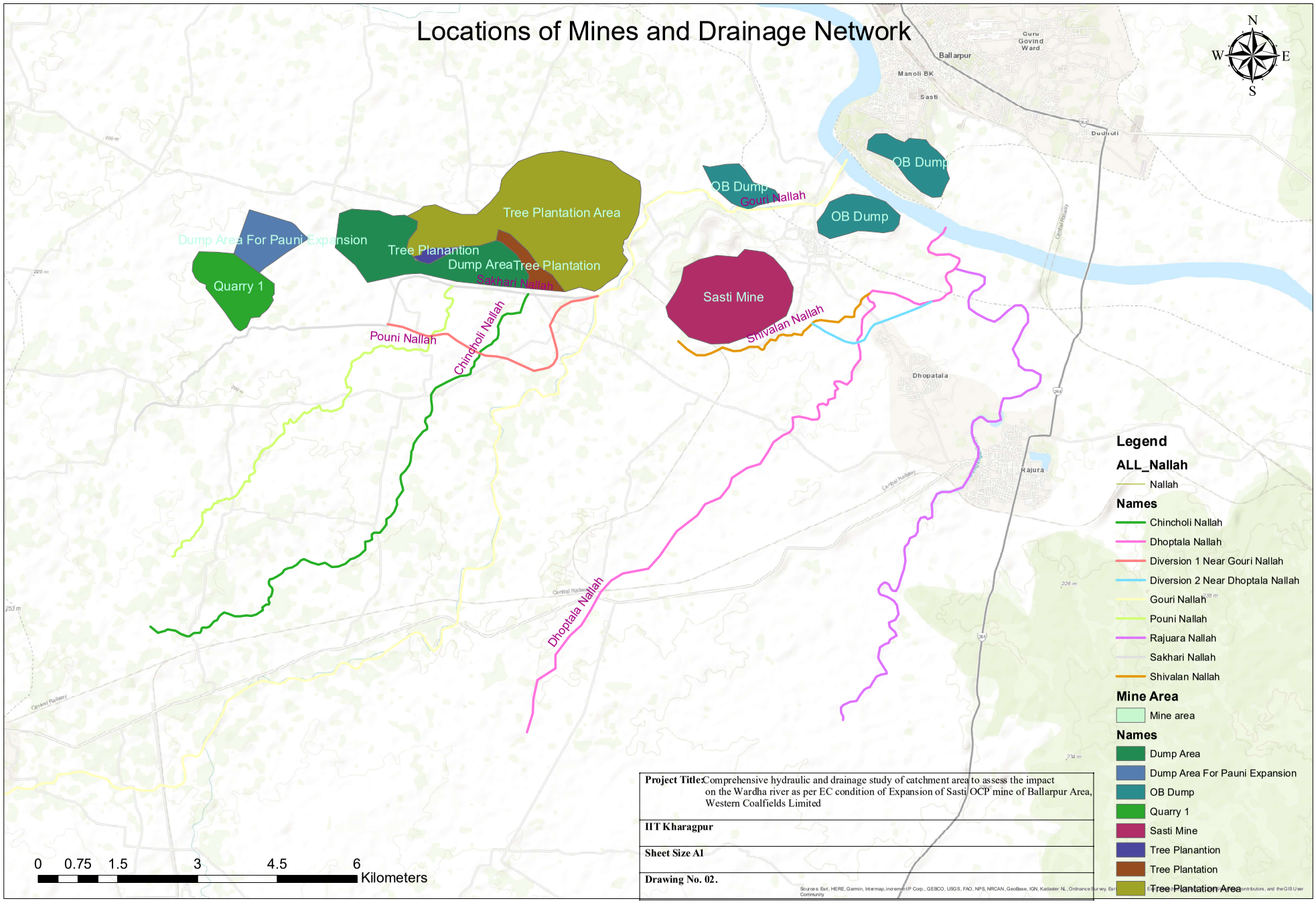
Objectives	Action Plan
Conservation and improvement of biodiversity	Implement tree maintenance techniques (plantation) in riparian buffers of the nala to enhance biodiversity and create habitats for pollinators etc.
Promoting the creation of new green spaces	Allocating funds for round the year maintenance of green spaces in 100 meter distance of the nala
Monitoring Biodiversity	Third party monitoring of aquatic as well as avifauna throughout different phases of the project to minimize risks and gain insights into behavioral impact, ensuring effective conservation and management strategies.
Maintenance of water bodies within *nalas*	Evaluation and management of invasive species near water bodies with particular attention to the growth and proliferation
Awareness and involvement in the protection of biodiversity	Conduct regular awareness programs and capacity building initiative on biodiversity, followed by the implementing of a monitoring protocol throughout project activities.

SUMMARY

The study of Gouri and Dhoptala Nallah diversions around the Ballarpur Sasti Mine revealed that the designs were highly effective in mitigating flood risks while ensuring sustainable water management. Advanced hydrologic modeling, including the use of the HEC-HMS model and Gumbel flood frequency analysis, confirmed that the diversions were capable of handling extreme rainfall events. The Gouri Nallah diversion, with a design capacity of 1400 m^3/s, aligned with the 50-year return period flood, while the Dhoptala Nallah diversion, with a capacity of 550 m^3/s, managed the 100-year return period flood. These results indicate that the diversions were appropriately designed to handle peak monsoon discharges without causing inundation in surrounding villages or disruptions to mining operations.

Key findings highlight that the diversions effectively confined floodwaters to their channels, preventing overflow into nearby areas. Observations post-diversion showed no significant flooding in villages like Gouri and Dhoptala during peak discharges. Although temporary disruptions to flora and fauna were anticipated, particularly changes to feeding and breeding behaviors of wildlife, the ecosystems around the nallahs are expected to adapt over time. Agricultural impacts, such as occasional submergence and altered irrigation patterns, were minor and localized. Overall, the study concludes that there is no significant impact of flooding on villages or on the flora and fauna due to the diversions, ensuring that the project strikes a balance between sustainable water management and environmental conservation.

Annexure 1


Locations of Mines and Drainage Network
N
W
E
S
Ballarpur
Guru Govind Ward
Manoli BK
Sasti
Dudholi
OB Dump
OB Dump
Gouri Nallah
OB Dump
Tree Plantation Area
Dump Area For Pauni Expansion
Tree Planantion
Dump Area
Tree Plantation
Sakhari Nallah
Quarry 1
Sasti Mine
Shivalan Nallah
Pouni Nallah
Chincholi Nallah
Dhopatala
Rajura
Dhoptala Nallah
Legend
ALL_Nallah
Nallah
Names
Chincholi Nallah
Dhoptala Nallah
Diversion 1 Near Gouri Nallah
Diversion 2 Near Dhoptala Nallah
Gouri Nallah
Pouni Nallah
Rajuara Nallah
Sakhari Nallah
Shivalan Nallah
Mine Area
Mine area
Names
Dump Area
Dump Area For Pauni Expansion
OB Dump
Quarry 1
Sasti Mine
Tree Planantion
Tree Plantation
Tree Plantation Area
0 0.75 1.5 3 4.5 6
Kilometers
Project Title: Comprehensive hydraulic and drainage study of catchment area to assess the impact on the Wardha river as per EC condition of Expansion of Sasti OCP mine of Ballarpur Area, Western Coalfields Limited
IIT Kharagpur
Sheet Size A1
Drawing No. 02.

Annexure 2

Total Monthly Rainfall at Sasti Mine in mm												
Months												
Year	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
1951	4.35	0.19	74.76	54.71	14.79	112.84	315.92	458.48	161.26	89.89	0.03	0.00
1952	0.00	21.25	2.55	9.43	3.11	93.06	245.31	276.64	220.21	32.53	0.00	0.13
1953	8.58	1.75	0.00	20.51	0.43	122.78	292.62	508.16	262.83	75.13	0.00	0.00
1954	0.06	0.08	17.99	7.50	2.90	119.10	440.18	219.78	306.38	23.30	0.28	0.21
1955	9.44	0.64	4.23	11.54	11.67	298.34	285.40	347.71	260.62	154.62	0.55	0.00
1956	0.56	41.18	3.53	2.23	45.73	456.84	323.53	173.29	231.65	96.26	40.27	3.25
1957	1.43	9.00	65.61	45.40	27.36	159.89	356.30	467.47	144.61	21.91	0.00	0.00
1958	8.10	0.99	34.24	10.68	23.21	88.97	407.87	478.70	258.94	94.04	43.87	0.00
1959	11.65	20.25	0.16	13.66	4.64	226.09	454.82	469.63	556.92	63.34	0.64	0.00
1960	24.07	0.00	41.11	10.60	11.65	308.40	406.71	164.65	128.32	38.58	1.21	3.74
1961	1.12	2.88	1.95	15.65	34.78	161.99	348.24	657.88	248.49	98.73	0.26	2.12
1962	0.87	2.00	17.99	21.84	67.81	58.01	198.01	232.02	209.60	68.01	19.51	70.79
1963	0.05	9.53	23.22	16.30	21.08	200.90	284.66	477.90	102.17	68.65	0.00	0.00
1964	0.00	3.21	14.06	4.94	0.90	141.40	247.23	394.84	238.53	55.03	4.24	0.59
1965	29.66	4.03	1.87	27.99	2.18	128.63	241.52	217.75	187.84	2.66	0.00	0.20
1966	9.06	0.02	11.82	38.82	21.42	105.92	470.82	274.56	302.28	2.56	19.28	28.37
1967	1.30	0.00	148.66	8.35	11.68	289.39	373.56	304.23	70.06	7.45	0.07	75.43
1968	18.67	46.92	74.93	27.61	2.43	152.18	302.35	152.10	240.83	16.84	3.16	1.35
1969	1.44	0.00	2.40	9.33	9.42	128.79	350.59	208.87	290.84	10.54	35.14	0.00
1970	16.19	1.13	17.37	14.07	19.93	269.55	271.09	451.76	250.15	14.50	0.00	0.00
1971	7.96	8.08	35.52	7.63	42.26	208.26	118.01	248.55	176.52	108.23	0.00	0.00
1972	0.00	0.29	0.12	9.16	6.72	154.51	204.83	242.11	69.16	27.38	41.81	2.87
1973	1.68	3.89	2.42	8.24	2.09	96.32	366.53	425.19	140.58	227.23	0.21	0.08
1974	0.00	11.70	5.56	1.10	22.97	115.63	183.98	292.64	120.77	191.39	6.43	0.01
1975	6.58	19.37	11.83	6.26	13.03	367.32	325.48	340.13	360.06	113.28	0.57	0.00
1976	7.46	0.00	6.99	8.28	5.48	80.74	568.70	256.50	182.25	3.54	39.28	0.00
1977	0.00	1.56	3.49	8.58	41.98	121.06	298.25	538.28	100.84	29.45	37.73	3.18
1978	38.01	22.61	19.02	35.82	7.81	202.20	555.78	418.34	69.98	29.56	29.06	32.91
1979	24.89	86.49	5.08	11.69	19.94	345.52	237.81	231.38	159.72	12.65	29.47	13.39
1980	12.42	4.98	0.97	6.09	0.52	223.71	318.66	403.62	168.98	1.52	0.09	15.00
1981	17.05	0.34	40.62	8.29	29.02	207.99	463.89	455.85	265.47	34.73	0.60	14.92
1982	49.39	8.40	5.19	8.90	31.32	112.87	256.65	213.54	201.12	113.57	9.01	0.00
1983	1.27	3.98	2.37	2.32	15.21	148.26	362.88	392.55	292.05	58.08	0.15	17.34
1984	19.98	31.84	1.70	23.52	1.32	115.19	276.98	216.39	78.37	93.99	0.01	1.10
1985	18.49	1.01	3.75	13.28	10.80	221.99	374.82	228.36	83.02	289.23	0.00	2.57
1986	19.34	58.84	15.70	29.31	9.38	228.54	447.30	581.25	100.73	30.05	11.14	39.09
1987	25.26	5.73	20.63	1.33	17.48	140.07	217.74	373.87	52.12	64.84	72.51	4.59
1988	0.20	31.60	4.99	23.46	2.47	192.45	565.49	392.54	184.27	153.71	6.23	1.54
1989	0.00	0.00	24.00	1.30	1.49	229.21	279.97	362.79	243.62	13.07	2.67	29.10
1990	2.03	17.01	13.41	1.08	183.49	348.22	404.00	762.49	158.33	130.57	6.29	5.70
1991	7.25	8.61	13.46	14.15	1.94	175.71	363.78	330.72	69.92	15.79	25.58	3.37
1992	0.00	0.87	0.01	6.89	8.78	239.49	302.93	672.91	161.20	34.10	21.36	0.00
1993	0.00	3.27	19.20	5.39	6.77	149.01	432.88	197.33	205.97	81.68	0.35	11.53
1994	8.18	23.91	0.00	20.73	11.20	262.02	559.75	366.87	203.54	135.55	7.81	0.00
1995	99.13	9.09	42.07	11.84	16.65	218.12	397.60	228.76	255.00	243.24	0.14	0.24
1996	8.35	7.90	5.39	15.52	0.77	140.06	254.70	285.93	167.44	100.56	1.14	0.00
1997	12.84	0.00	6.36	38.52	15.66	114.69	256.85	278.68	212.45	66.47	42.75	67.87
1998	11.17	13.62	9.44	9.69	9.25	106.60	418.64	254.88	290.28	43.65	32.19	0.19
1999	0.21	25.47	1.31	0.00	30.43	248.25	235.32	267.52	258.59	122.35	0.00	0.00
2000	0.92	30.54	0.07	0.58	45.24	288.62	325.75	367.06	49.33	13.71	0.00	0.18
2001	10.49	0.00	10.68	16.68	5.28	285.89	213.59	326.47	37.61	39.69	3.27	0.00
2002	1.69	4.21	1.96	3.78	5.85	391.94	122.44	262.37	65.32	38.31	0.42	0.00
2003	0.63	10.95	12.33	5.14	0.82	138.78	454.14	337.80	118.76	103.36	1.12	13.20
2004	13.18	2.50	3.46	4.62	12.96	137.53	158.83	206.90	94.83	24.21	11.65	0.00
2005	119.49	15.71	17.75	15.51	25.58	196.13	694.43	269.38	166.64	98.71	0.00	11.08
2006	0.00	0.00	23.45	24.05	37.10	165.77	493.49	360.55	188.79	43.31	4.94	0.00
2007	0.00	0.09	0.91	4.86	3.46	549.46	479.01	334.47	295.05	47.51	6.66	0.00
2008	0.00	0.04	39.26	2.13	2.99	191.12	318.57	563.06	136.92	34.09	2.83	0.00
2009	0.00	0.00	2.21	0.56	12.04	88.86	240.02	194.87	79.07	43.06	65.00	6.74
2010	14.90	19.51	21.82	1.76	9.21	152.26	423.21	602.97	365.94	116.66	46.16	12.99
2011	0.00	3.22	0.42	39.07	1.68	151.66	253.25	328.56	217.81	6.72	0.00	0.00
2012	14.87	0.14	0.00	0.84	0.08	96.36	486.55	390.01	277.20	85.68	7.90	0.00
2013	5.18	34.74	2.80	5.51	1.52	361.39	809.19	363.16	172.22	181.86	0.54	0.11
2014	0.79	9.90	62.98	2.39	7.79	62.19	214.32	221.20	278.07	18.89	2.29	0.06
2015	34.46	6.66	87.50	31.55	14.48	350.59	117.73	294.62	233.02	3.82	0.00	3.44
2016	0.50	6.46	29.51	20.75	29.11	408.99	609.76	120.89	364.50	65.94	0.00	0.00
2017	0.03	0.03	33.64	0.09	20.05	164.44	312.60	193.06	196.85	47.06	1.50	0.00
2018	0.00	13.88	7.95	29.89	32.28	174.90	451.47	350.73	78.88	0.01	0.42	13.60
2019	10.61	9.30	1.31	3.52	0.04	119.48	268.82	308.95	216.89	83.83	7.02	1.78
2020	22.07	5.19	53.85	28.65	30.50	178.16	404.70	195.65	106.61	73.89	15.21	0.24

Annexure 3.1

	Montly Discharge data of Chincholi Nallha												
	Month												
Year	**1.0**	**2.0**	**3.0**	**4.0**	**5.0**	**6.0**	**7.0**	**8.0**	**9.0**	**10.0**	**11.0**	**12.0**	Grand Tota
1952	0.0	0.0	0.0	0.0	0.0	0.0	0.0	188.5	0.0	0.0	0.0	0.0	188.5
1953	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1038.5	100.5	0.0	0.0	0.0	1139.0
1954	0.0	0.0	0.0	0.0	0.0	0.0	162.9	10.6	275.6	0.0	0.0	0.0	449.1
1955	0.0	0.0	0.0	0.0	0.0	0.0	22.6	51.3	0.0	0.0	0.0	0.0	73.9
1956	0.0	0.0	0.0	0.0	0.0	937.0	56.5	112.7	42.3	21.4	0.0	0.0	1169.9
1957	0.0	0.0	0.0	0.0	0.0	0.0	0.0	577.5	66.0	0.0	0.0	0.0	643.4
1958	0.0	0.0	0.0	0.0	0.0	0.0	67.0	451.0	181.7	0.0	0.0	0.0	699.7
1959	0.0	0.0	0.0	0.0	0.0	0.0	208.2	545.7	1405.7	0.0	0.0	0.0	2159.6
1960	0.0	0.0	0.0	0.0	0.0	0.0	169.3	143.8	0.0	0.0	0.0	0.0	313.0
1961	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1193.4	63.2	0.0	0.0	0.0	1256.6
1962	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1963	0.0	0.0	0.0	0.0	0.0	0.0	12.0	321.9	0.0	0.0	0.0	0.0	334.0
1964	0.0	0.0	0.0	0.0	0.0	0.0	0.0	161.6	214.7	0.0	0.0	0.0	376.3
1965	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.7	0.0	0.0	0.0	31.7
1966	0.0	0.0	0.0	0.0	0.0	0.0	429.8	238.7	654.6	0.0	0.0	0.0	1323.0
1967	0.0	0.0	0.0	0.0	0.0	0.0	443.1	83.8	0.0	0.0	0.0	0.0	526.9
1968	0.0	0.0	0.0	0.0	0.0	0.0	36.8	12.1	30.2	0.0	0.0	0.0	79.1
1969	0.0	0.0	0.0	0.0	0.0	0.0	27.9	0.0	262.8	0.0	0.0	0.0	290.6
1970	0.0	0.0	0.0	0.0	0.0	0.0	0.0	290.9	39.6	0.0	0.0	0.0	330.5
1971	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	319.5	0.0	0.0	0.0	319.5
1972	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1973	0.0	0.0	0.0	0.0	0.0	0.0	119.1	173.8	0.0	95.7	0.0	0.0	388.7
1974	0.0	0.0	0.0	0.0	0.0	0.0	0.0	165.8	0.0	0.0	0.0	0.0	165.8
1975	0.0	0.0	0.0	0.0	0.0	215.0	10.1	227.7	305.9	0.0	0.0	0.0	758.7
1976	0.0	0.0	0.0	0.0	0.0	0.0	547.6	10.4	229.4	0.0	0.0	0.0	787.5
1977	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1123.4	0.0	0.0	0.0	0.0	1123.4
1978	0.0	0.0	0.0	0.0	0.0	0.0	671.4	502.4	0.0	0.0	0.0	0.0	1173.8
1979	0.0	0.0	0.0	0.0	0.0	113.0	44.7	176.7	0.0	0.0	0.0	0.0	334.4
1980	0.0	0.0	0.0	0.0	0.0	0.0	0.0	443.3	0.0	0.0	0.0	0.0	443.3
1981	0.0	0.0	0.0	0.0	0.0	0.0	489.4	1159.5	12.7	0.0	0.0	0.0	1661.6
1982	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.1	20.9	0.0	0.0	0.0	65.0
1983	0.0	0.0	0.0	0.0	0.0	0.0	0.0	406.4	0.0	0.0	0.0	0.0	406.4
1984	0.0	0.0	0.0	0.0	0.0	0.0	0.0	221.3	0.0	0.0	0.0	0.0	221.3
1985	0.0	0.0	0.0	0.0	0.0	0.0	285.9	66.1	0.0	571.1	0.0	0.0	923.0
1986	0.0	0.0	0.0	0.0	0.0	0.0	718.5	1945.0	0.0	0.0	0.0	0.0	2663.5
1987	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.6	0.0	0.0	0.0	0.0	10.6
1988	0.0	0.0	0.0	0.0	0.0	0.0	531.8	441.3	0.0	418.2	0.0	0.0	1391.3
1989	0.0	0.0	0.0	0.0	0.0	0.0	0.0	360.0	88.4	0.0	0.0	0.0	448.3
1990	0.0	0.0	0.0	0.0	0.0	74.5	602.8	2295.4	0.0	0.0	0.0	0.0	2972.7
1991	0.0	0.0	0.0	0.0	0.0	0.0	120.0	850.4	0.0	0.0	0.0	0.0	970.4
1992	0.0	0.0	0.0	0.0	0.0	0.0	145.3	1488.0	98.4	0.0	0.0	0.0	1731.7
1993	0.0	0.0	0.0	0.0	0.0	0.0	172.9	117.1	0.0	0.0	0.0	0.0	290.0
1994	0.0	0.0	0.0	0.0	0.0	0.0	961.2	340.9	378.7	0.0	0.0	0.0	1680.8
1995	0.0	0.0	0.0	0.0	0.0	0.0	121.9	48.3	404.5	449.9	0.0	0.0	1024.5
1996	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1997	0.0	0.0	0.0	0.0	0.0	0.0	0.0	134.7	65.9	0.0	0.0	0.0	200.6
1998	0.0	0.0	0.0	0.0	0.0	0.0	94.2	0.0	194.0	0.0	0.0	0.0	288.2
1999	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.3	0.0	0.0	0.0	0.0	50.3
2000	0.0	0.0	0.0	0.0	0.0	0.0	77.7	496.0	0.0	0.0	0.0	0.0	573.8
2001	0.0	0.0	0.0	0.0	0.0	0.0	0.0	86.3	0.0	0.0	0.0	0.0	86.3
2002	0.0	0.0	0.0	0.0	0.0	349.8	0.0	113.3	0.0	0.0	0.0	0.0	463.1
2003	0.0	0.0	0.0	0.0	0.0	0.0	285.4	580.1	0.0	0.0	0.0	0.0	865.5
2004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.0	0.0	0.0	0.0	0.0	0.0	1505.6	454.9	0.0	0.0	0.0	0.0	1960.5
2006	0.0	0.0	0.0	0.0	0.0	0.0	826.2	625.0	0.0	11.1	0.0	0.0	1462.3
2007	0.0	0.0	0.0	0.0	0.0	1088.1	921.9	404.8	301.9	0.0	0.0	0.0	2716.7
2008	0.0	0.0	0.0	0.0	0.0	0.0	24.2	1969.8	0.0	0.0	0.0	0.0	1994.0
2009	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010	0.0	0.0	0.0	0.0	0.0	0.0	109.6	1599.3	1003.8	0.0	0.0	0.0	2712.7
2011	0.0	0.0	0.0	0.0	0.0	0.0	0.0	195.8	78.1	0.0	0.0	0.0	273.9
2012	0.0	0.0	0.0	0.0	0.0	0.0	436.3	487.3	298.7	27.7	0.0	0.0	1250.0
2013	0.0	0.0	0.0	0.0	0.0	0.0	2239.5	653.5	11.6	24.0	0.0	0.0	2928.7
2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	792.6	0.0	0.0	0.0	792.6
2015	0.0	0.0	0.0	0.0	0.0	78.3	0.0	73.0	343.7	0.0	0.0	0.0	495.0
2016	0.0	0.0	0.0	0.0	0.0	431.2	1609.8	0.0	178.1	0.0	0.0	0.0	2219.0
2017	0.0	0.0	0.0	0.0	0.0	0.0	26.9	0.0	11.5	0.0	0.0	0.0	38.4
2018	0.0	0.0	0.0	0.0	0.0	0.0	371.2	500.0	0.0	0.0	0.0	0.0	871.2
2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	86.9	0.0	0.0	0.0	0.0	86.9
2020	0.0	0.0	0.0	0.0	0.0	0.0	181.2	11.5	0.0	0.0	0.0	0.0	192.7
Grand Total	0.0	0.0	0.0	0.0	0.0	3286.9	15888.5	26562.6	8506.3	1619.1	0.0	0.0	55863.4

Annexure 3.2

	Montly Discharge data of Dhoptala Nalhha												
	Month												
Year	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	Grand Tota
1952	0.0	0.0	0.0	0.0	0.0	0.0	0.0	745.2	0.0	0.0	0.0	0.0	745.2
1953	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2728.0	165.7	0.0	0.0	0.0	2893.6
1954	0.0	0.0	0.0	0.0	0.0	0.0	685.5	11.2	489.8	0.0	0.0	0.0	1186.5
1955	0.0	0.0	0.0	0.0	0.0	255.7	11.5	71.6	55.8	0.0	0.0	0.0	394.7
1956	0.0	0.0	0.0	0.0	0.0	2422.1	196.8	202.4	206.0	0.0	0.0	0.0	3027.3
1957	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1101.5	128.6	0.0	0.0	0.0	1230.0
1958	0.0	0.0	0.0	0.0	0.0	0.0	310.5	681.0	874.8	0.0	0.0	0.0	1866.4
1959	0.0	0.0	0.0	0.0	0.0	0.0	703.8	1245.5	3787.3	0.0	0.0	0.0	5736.6
1960	0.0	0.0	0.0	0.0	0.0	192.0	675.5	307.1	0.0	0.0	0.0	0.0	1174.6
1961	0.0	0.0	0.0	0.0	0.0	0.0	67.6	2929.6	677.6	0.0	0.0	0.0	3674.8
1962	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1963	0.0	0.0	0.0	0.0	0.0	0.0	158.2	619.0	0.0	0.0	0.0	0.0	777.2
1964	0.0	0.0	0.0	0.0	0.0	0.0	0.0	381.5	525.8	0.0	0.0	0.0	907.4
1965	0.0	0.0	0.0	0.0	0.0	0.0	0.0	63.9	131.0	0.0	0.0	0.0	194.9
1966	0.0	0.0	0.0	0.0	0.0	0.0	2055.0	459.9	1715.2	0.0	0.0	0.0	4230.1
1967	0.0	0.0	0.0	0.0	0.0	256.3	1064.7	146.2	0.0	0.0	0.0	0.0	1467.2
1968	0.0	0.0	0.0	0.0	0.0	0.0	324.3	25.3	106.6	0.0	0.0	0.0	456.1
1969	0.0	0.0	0.0	0.0	0.0	0.0	426.3	0.0	578.9	0.0	0.0	0.0	1005.3
1970	0.0	0.0	0.0	0.0	0.0	0.0	0.0	622.7	86.1	0.0	0.0	0.0	708.8
1971	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	738.9	0.0	0.0	0.0	738.9
1972	0.0	0.0	0.0	0.0	0.0	0.0	112.0	0.0	0.0	0.0	0.0	0.0	112.0
1973	0.0	0.0	0.0	0.0	0.0	0.0	601.1	374.7	0.0	218.3	0.0	0.0	1194.0
1974	0.0	0.0	0.0	0.0	0.0	0.0	0.0	706.5	0.0	52.3	0.0	0.0	758.8
1975	0.0	0.0	0.0	0.0	0.0	1036.3	10.4	369.9	580.7	0.0	0.0	0.0	1997.1
1976	0.0	0.0	0.0	0.0	0.0	0.0	1741.8	61.2	455.5	0.0	0.0	0.0	2258.4
1977	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2655.3	0.0	0.0	0.0	0.0	2655.3
1978	0.0	0.0	0.0	0.0	0.0	0.0	1638.5	1235.4	0.0	0.0	0.0	0.0	2873.9
1979	0.0	0.0	0.0	0.0	0.0	885.1	67.3	342.0	0.0	0.0	0.0	0.0	1294.3
1980	0.0	0.0	0.0	0.0	0.0	0.0	34.5	1052.7	0.0	0.0	0.0	0.0	1087.2
1981	0.0	0.0	0.0	0.0	0.0	0.0	1238.6	2565.6	63.6	0.0	0.0	0.0	3867.8
1982	0.0	0.0	0.0	0.0	0.0	0.0	0.0	213.0	37.0	0.0	0.0	0.0	250.0
1983	0.0	0.0	0.0	0.0	0.0	0.0	79.9	1241.9	21.2	0.0	0.0	0.0	1343.0
1984	0.0	0.0	0.0	0.0	0.0	0.0	0.0	771.8	0.0	0.0	0.0	0.0	771.8
1985	0.0	0.0	0.0	0.0	0.0	0.0	1018.0	144.8	0.0	1380.1	0.0	0.0	2542.8
1986	0.0	0.0	0.0	0.0	0.0	0.0	1966.3	4979.7	0.0	0.0	0.0	0.0	6946.1
1987	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.5	0.0	0.0	0.0	0.0	41.5
1988	0.0	0.0	0.0	0.0	0.0	0.0	1149.4	1001.1	0.0	978.4	0.0	0.0	3128.8
1989	0.0	0.0	0.0	0.0	0.0	0.0	0.0	700.7	189.2	0.0	0.0	0.0	889.8
1990	0.0	0.0	0.0	0.0	0.0	547.6	1425.9	5171.5	0.0	0.0	0.0	0.0	7145.0
1991	0.0	0.0	0.0	0.0	0.0	0.0	340.5	1908.1	0.0	0.0	0.0	0.0	2248.6
1992	0.0	0.0	0.0	0.0	0.0	81.8	365.7	4429.0	143.7	0.0	0.0	0.0	5020.2
1993	0.0	0.0	0.0	0.0	0.0	0.0	865.6	190.5	0.0	0.0	0.0	0.0	1056.1
1994	0.0	0.0	0.0	0.0	0.0	0.0	2534.7	603.2	782.5	0.0	0.0	0.0	3920.4
1995	0.0	0.0	0.0	0.0	0.0	0.0	383.3	71.7	927.1	957.0	0.0	0.0	2339.1
1996	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.7	0.0	0.0	0.0	0.0	32.7
1997	0.0	0.0	0.0	0.0	0.0	0.0	0.0	470.6	113.9	0.0	0.0	0.0	584.5
1998	0.0	0.0	0.0	0.0	0.0	0.0	234.5	0.0	341.6	0.0	0.0	0.0	576.1
1999	0.0	0.0	0.0	0.0	0.0	0.0	0.0	205.7	0.0	0.0	0.0	0.0	205.7
2000	0.0	0.0	0.0	0.0	0.0	0.0	238.3	1111.2	0.0	0.0	0.0	0.0	1349.6
2001	0.0	0.0	0.0	0.0	0.0	100.1	0.0	142.8	0.0	0.0	0.0	0.0	242.8
2002	0.0	0.0	0.0	0.0	0.0	1398.3	0.0	303.5	0.0	0.0	0.0	0.0	1701.8
2003	0.0	0.0	0.0	0.0	0.0	0.0	649.1	1299.2	0.0	0.0	0.0	0.0	1948.3
2004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.0	0.0	0.0	0.0	0.0	0.0	4194.3	923.5	0.0	0.0	0.0	0.0	5117.8
2006	0.0	0.0	0.0	0.0	0.0	0.0	2366.4	1431.7	0.0	63.4	0.0	0.0	3861.5
2007	0.0	0.0	0.0	0.0	0.0	2421.1	2911.9	838.1	574.8	0.0	0.0	0.0	6745.9
2008	0.0	0.0	0.0	0.0	0.0	0.0	48.9	5021.8	0.0	0.0	0.0	0.0	5070.7
2009	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010	0.0	0.0	0.0	0.0	0.0	0.0	399.1	3070.7	2141.5	0.0	0.0	0.0	5611.4
2011	0.0	0.0	0.0	0.0	0.0	0.0	11.1	448.6	144.6	0.0	0.0	0.0	604.3
2012	0.0	0.0	0.0	0.0	0.0	0.0	1372.4	1016.3	500.1	132.8	0.0	0.0	3021.6
2013	0.0	0.0	0.0	0.0	0.0	210.9	5256.6	1566.7	79.8	62.1	0.0	0.0	7176.1
2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1913.5	0.0	0.0	0.0	1913.5
2015	0.0	0.0	0.0	0.0	0.0	547.2	0.0	345.4	702.9	0.0	0.0	0.0	1595.6
2016	0.0	0.0	0.0	0.0	0.0	1839.2	3691.1	0.0	476.6	0.0	0.0	0.0	6006.8
2017	0.0	0.0	0.0	0.0	0.0	0.0	359.1	11.8	25.4	0.0	0.0	0.0	396.3
2018	0.0	0.0	0.0	0.0	0.0	0.0	1536.7	959.4	0.0	0.0	0.0	0.0	2496.1
2019	0.0	0.0	0.0	0.0	0.0	0.0	102.6	343.1	0.0	0.0	0.0	0.0	445.7
2020	0.0	0.0	0.0	0.0	0.0	0.0	440.0	38.7	0.0	0.0	0.0	0.0	478.8
Grand Total	0.0	0.0	0.0	0.0	0.0	12193.6	46065.5	62754.8	20483.1	3844.3	0.0	0.0	145341.4

Annexure 3.3

	Montly Discharge data of Gauri Nallha												
	Month												
Year	**1.0**	**2.0**	**3.0**	**4.0**	**5.0**	**6.0**	**7.0**	**8.0**	**9.0**	**10.0**	**11.0**	**12.0**	Grand Tota
1952	0.0	0.0	0.0	0.0	0.0	0.0	63.5	2236.3	469.3	0.0	0.0	0.0	2769.0
1953	0.0	0.0	0.0	0.0	0.0	0.0	268.8	7311.2	1305.6	79.2	0.0	0.0	8964.8
1954	0.0	0.0	0.0	0.0	0.0	0.0	3572.8	1269.8	2161.8	0.0	0.0	0.0	7004.4
1955	0.0	0.0	0.0	0.0	0.0	2171.2	929.6	1292.8	1116.6	139.7	0.0	0.0	5649.9
1956	0.0	0.0	0.0	0.0	0.0	6983.0	1083.2	1267.1	1187.2	288.5	0.0	0.0	10808.9
1957	0.0	0.0	0.0	0.0	0.0	0.0	1388.4	5382.3	846.6	0.0	0.0	0.0	7617.3
1958	0.0	0.0	0.0	0.0	0.0	0.0	2358.2	4164.5	2437.8	190.3	0.0	0.0	9150.8
1959	0.0	0.0	0.0	0.0	0.0	661.2	3869.1	5519.2	11166.7	0.0	0.0	0.0	21216.2
1960	0.0	0.0	0.0	0.0	0.0	1493.4	2509.6	1351.0	0.0	0.0	0.0	0.0	5354.1
1961	0.0	0.0	0.0	0.0	0.0	0.0	1165.0	10706.3	3098.8	0.0	0.0	0.0	14970.2
1962	0.0	0.0	0.0	0.0	0.0	0.0	0.0	86.1	97.5	0.0	0.0	0.0	183.6
1963	0.0	0.0	0.0	0.0	0.0	0.0	1152.0	6023.8	0.0	0.0	0.0	0.0	7175.9
1964	0.0	0.0	0.0	0.0	0.0	0.0	23.1	3358.1	1890.1	0.0	0.0	0.0	5271.2
1965	0.0	0.0	0.0	0.0	0.0	0.0	0.0	581.3	1144.1	0.0	0.0	0.0	1725.4
1966	0.0	0.0	0.0	0.0	0.0	0.0	5884.6	3119.7	4164.6	0.0	0.0	0.0	13168.9
1967	0.0	0.0	0.0	0.0	0.0	2522.0	3233.9	1965.6	0.0	0.0	0.0	0.0	7721.5
1968	0.0	0.0	0.0	0.0	0.0	0.0	1486.4	416.8	913.8	0.0	0.0	0.0	2817.0
1969	0.0	0.0	0.0	0.0	0.0	0.0	1748.2	303.3	2095.6	0.0	0.0	0.0	4147.2
1970	0.0	0.0	0.0	0.0	0.0	26.5	616.1	3558.0	1052.3	0.0	0.0	0.0	5252.9
1971	0.0	0.0	0.0	0.0	0.0	311.5	0.0	754.0	1942.4	0.0	0.0	0.0	3007.9
1972	0.0	0.0	0.0	0.0	0.0	0.0	1616.7	125.4	0.0	0.0	0.0	0.0	1742.1
1973	0.0	0.0	0.0	0.0	0.0	0.0	2711.1	2669.2	135.9	1286.9	0.0	0.0	6803.0
1974	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2514.6	0.0	684.3	0.0	0.0	3198.8
1975	0.0	0.0	0.0	0.0	0.0	4208.2	881.7	2219.4	3066.2	24.6	0.0	0.0	10400.1
1976	0.0	0.0	0.0	0.0	0.0	0.0	6827.6	680.1	2023.8	0.0	0.0	0.0	9531.5
1977	0.0	0.0	0.0	0.0	0.0	0.0	478.6	7331.3	195.8	0.0	0.0	0.0	8005.7
1978	0.0	0.0	0.0	0.0	0.0	0.0	6432.4	4881.1	0.0	0.0	0.0	0.0	11313.5
1979	0.0	0.0	0.0	0.0	0.0	3735.4	616.7	1598.3	0.0	0.0	0.0	0.0	5950.4
1980	0.0	0.0	0.0	0.0	0.0	0.0	1269.1	4375.1	332.4	0.0	0.0	0.0	5976.6
1981	0.0	0.0	0.0	0.0	0.0	481.1	5718.5	6841.4	606.6	0.0	0.0	0.0	13647.7
1982	0.0	0.0	0.0	0.0	0.0	0.0	156.9	1043.5	716.8	21.5	0.0	0.0	1938.7
1983	0.0	0.0	0.0	0.0	0.0	0.0	1168.9	4874.8	746.3	0.0	0.0	0.0	6789.9
1984	0.0	0.0	0.0	0.0	0.0	0.0	285.5	2207.1	0.0	0.0	0.0	0.0	2492.6
1985	0.0	0.0	0.0	0.0	0.0	288.0	3067.3	1264.8	0.0	4063.3	0.0	0.0	8683.4
1986	0.0	0.0	0.0	0.0	0.0	33.7	5293.1	11875.8	0.0	0.0	0.0	0.0	17202.6
1987	0.0	0.0	0.0	0.0	0.0	0.0	40.3	1569.1	0.0	0.0	0.0	0.0	1609.4
1988	0.0	0.0	0.0	0.0	0.0	0.0	6163.1	4138.3	0.0	2882.7	0.0	0.0	13184.2
1989	0.0	0.0	0.0	0.0	0.0	159.2	900.6	3171.6	1085.0	0.0	0.0	0.0	5316.4
1990	0.0	0.0	0.0	0.0	430.8	2250.3	4559.5	13329.1	217.3	257.2	0.0	0.0	21044.3
1991	0.0	0.0	0.0	0.0	0.0	0.0	1820.6	4800.5	0.0	0.0	0.0	0.0	6621.1
1992	0.0	0.0	0.0	0.0	0.0	1488.6	1608.9	12201.7	1401.9	0.0	0.0	0.0	16701.1
1993	0.0	0.0	0.0	0.0	0.0	0.0	3641.9	961.5	500.5	0.0	0.0	0.0	5104.0
1994	0.0	0.0	0.0	0.0	0.0	567.5	7672.8	3272.1	2552.6	0.0	0.0	0.0	14065.0
1995	0.0	0.0	0.0	0.0	0.0	663.9	2750.4	846.2	2614.4	2899.8	0.0	0.0	9774.7
1996	0.0	0.0	0.0	0.0	0.0	366.5	51.2	888.3	246.0	0.0	0.0	0.0	1552.0
1997	0.0	0.0	0.0	0.0	0.0	0.0	271.3	2112.7	957.8	0.0	0.0	0.0	3341.8
1998	0.0	0.0	0.0	0.0	0.0	0.0	2714.0	646.2	1740.8	0.0	0.0	0.0	5101.0
1999	0.0	0.0	0.0	0.0	0.0	742.1	241.3	1311.5	664.1	46.8	0.0	0.0	3005.8
2000	0.0	0.0	0.0	0.0	0.0	636.9	1998.3	3740.0	0.0	0.0	0.0	0.0	6375.2
2001	0.0	0.0	0.0	0.0	0.0	1937.0	183.0	1697.1	0.0	0.0	0.0	0.0	3817.1
2002	0.0	0.0	0.0	0.0	0.0	4699.1	89.0	1251.0	0.0	0.0	0.0	0.0	6039.1
2003	0.0	0.0	0.0	0.0	0.0	0.0	3720.4	3609.3	0.0	0.0	0.0	0.0	7329.7
2004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	333.9	0.0	0.0	0.0	0.0	333.9
2005	0.0	0.0	0.0	0.0	0.0	255.2	11212.3	2853.5	0.0	109.9	0.0	0.0	14430.9
2006	0.0	0.0	0.0	0.0	0.0	48.5	7927.9	3841.9	164.7	465.4	0.0	0.0	12448.5
2007	0.0	0.0	0.0	0.0	0.0	7416.5	7711.2	3073.0	2428.3	0.0	0.0	0.0	20629.1
2008	0.0	0.0	0.0	0.0	0.0	305.7	1439.2	12710.6	21.4	0.0	0.0	0.0	14476.9
2009	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.9	184.1	0.0	0.0	0.0	224.0
2010	0.0	0.0	0.0	0.0	0.0	0.0	2373.5	9695.7	6008.3	239.8	0.0	0.0	18317.3
2011	0.0	0.0	0.0	0.0	0.0	0.0	691.6	1870.6	1453.3	0.0	0.0	0.0	4015.4
2012	0.0	0.0	0.0	0.0	0.0	0.0	4703.7	3772.4	2271.5	742.1	0.0	0.0	11489.7
2013	0.0	0.0	0.0	0.0	0.0	2092.7	14166.7	4993.0	582.8	993.7	0.0	0.0	22828.8
2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0	404.3	4919.3	0.0	0.0	0.0	5323.6
2015	0.0	0.0	0.0	0.0	0.0	2481.7	0.0	1765.8	2450.9	0.0	0.0	0.0	6698.4
2016	0.0	0.0	0.0	0.0	0.0	5134.2	9382.2	0.0	2523.4	162.7	0.0	0.0	17202.5
2017	0.0	0.0	0.0	0.0	0.0	0.0	1635.0	447.1	498.5	0.0	0.0	0.0	2580.6
2018	0.0	0.0	0.0	0.0	0.0	0.0	6502.6	3782.8	0.0	0.0	0.0	0.0	10285.4
2019	0.0	0.0	0.0	0.0	0.0	0.0	1186.2	2178.1	305.4	0.0	0.0	0.0	3669.7
2020	0.0	0.0	0.0	0.0	0.0	0.0	2722.1	460.4	0.0	0.0	0.0	0.0	3182.5
Grand Total	0.0	0.0	0.0	0.0	430.8	54160.7	177957.9	226938.2	80706.7	15578.5	0.0	0.0	555772.8

Annexure 3.4

	Montly Discharge data of Out fall of The Sakhari And Chincholi Nallah												
	Month												
Year	**1.0**	**2.0**	**3.0**	**4.0**	**5.0**	**6.0**	**7.0**	**8.0**	**9.0**	**10.0**	**11.0**	**12.0**	Grand Tota
1952	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1953	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.9	0.0	0.0	0.0	0.0	29.9
1954	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1955	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1956	0.0	0.0	0.0	0.0	0.0	35.2	0.0	0.0	0.0	0.0	0.0	0.0	35.2
1957	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.7	0.0	0.0	0.0	0.0	11.7
1958	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1959	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	85.3	0.0	0.0	0.0	85.3
1960	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1961	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.1	0.0	0.0	0.0	0.0	10.1
1962	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1963	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1964	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1965	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1966	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.5	0.0	0.0	0.0	10.5
1967	0.0	0.0	0.0	0.0	0.0	0.0	24.5	0.0	0.0	0.0	0.0	0.0	24.5
1968	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1971	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1972	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1973	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1974	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1975	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1976	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1977	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.3	0.0	0.0	0.0	0.0	24.3
1978	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1979	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1981	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.1	0.0	0.0	0.0	0.0	37.1
1982	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1983	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1984	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1985	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.8	0.0	0.0	40.8
1986	0.0	0.0	0.0	0.0	0.0	0.0	0.0	125.9	0.0	0.0	0.0	0.0	125.9
1987	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1988	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.7	0.0	0.0	25.7
1989	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990	0.0	0.0	0.0	0.0	0.0	0.0	38.8	129.8	0.0	0.0	0.0	0.0	168.7
1991	0.0	0.0	0.0	0.0	0.0	0.0	0.0	53.8	0.0	0.0	0.0	0.0	53.8
1992	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1994	0.0	0.0	0.0	0.0	0.0	0.0	45.4	0.0	0.0	0.0	0.0	0.0	45.4
1995	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1996	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1997	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1998	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1999	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.3	0.0	0.0	0.0	0.0	23.3
2001	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2002	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.0	0.0	0.0	0.0	0.0	0.0	37.7	26.4	0.0	0.0	0.0	0.0	64.1
2006	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.4	0.0	0.0	0.0	0.0	23.4
2007	0.0	0.0	0.0	0.0	0.0	58.4	0.0	10.4	0.0	0.0	0.0	0.0	68.7
2008	0.0	0.0	0.0	0.0	0.0	0.0	0.0	155.6	0.0	0.0	0.0	0.0	155.6
2009	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010	0.0	0.0	0.0	0.0	0.0	0.0	0.0	94.7	0.0	0.0	0.0	0.0	94.7
2011	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2012	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.4	0.0	0.0	0.0	0.0	13.4
2013	0.0	0.0	0.0	0.0	0.0	0.0	81.6	0.0	0.0	0.0	0.0	0.0	81.6
2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.3	0.0	0.0	0.0	13.3
2015	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2016	0.0	0.0	0.0	0.0	0.0	0.0	96.8	0.0	0.0	0.0	0.0	0.0	96.8
2017	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2018	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2019	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2020	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grand Total	0.0	0.0	0.0	0.0	0.0	93.6	324.8	769.6	109.1	66.6	0.0	0.0	1363.6

Annexure 3.5

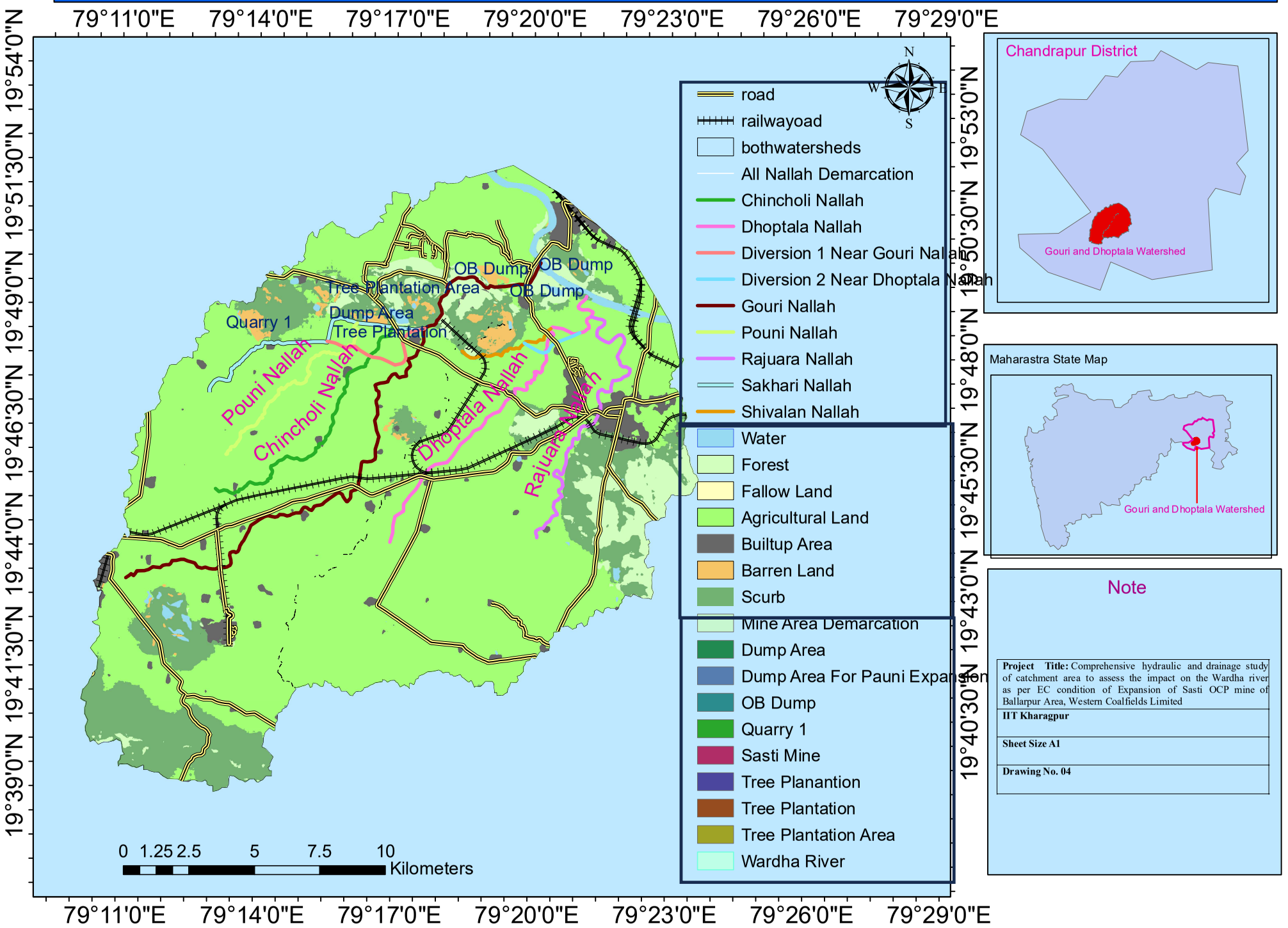
	Montly Discharge data of Pauni Nallha												
	Month												
Year	**1.0**	**2.0**	**3.0**	**4.0**	**5.0**	**6.0**	**7.0**	**8.0**	**9.0**	**10.0**	**11.0**	**12.0**	Grand Tota
1952	0.0	0.0	0.0	0.0	0.0	0.0	0.0	144.3	0.0	0.0	0.0	0.0	144.3
1953	0.0	0.0	0.0	0.0	0.0	0.0	0.0	427.8	27.3	0.0	0.0	0.0	455.2
1954	0.0	0.0	0.0	0.0	0.0	0.0	16.9	0.0	101.3	0.0	0.0	0.0	118.2
1955	0.0	0.0	0.0	0.0	0.0	74.6	0.0	0.0	0.0	0.0	0.0	0.0	74.6
1956	0.0	0.0	0.0	0.0	0.0	471.2	11.0	40.2	11.5	0.0	0.0	0.0	533.9
1957	0.0	0.0	0.0	0.0	0.0	0.0	0.0	194.2	11.6	0.0	0.0	0.0	205.8
1958	0.0	0.0	0.0	0.0	0.0	0.0	28.2	140.9	27.3	0.0	0.0	0.0	196.3
1959	0.0	0.0	0.0	0.0	0.0	0.0	104.5	128.3	517.1	0.0	0.0	0.0	749.8
1960	0.0	0.0	0.0	0.0	0.0	42.7	55.7	27.8	0.0	0.0	0.0	0.0	126.2
1961	0.0	0.0	0.0	0.0	0.0	0.0	0.0	358.4	31.8	0.0	0.0	0.0	390.2
1962	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1963	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.0	0.0	0.0	0.0	0.0	29.0
1964	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.4	0.0	0.0	0.0	100.4
1965	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.5	0.0	0.0	0.0	10.5
1966	0.0	0.0	0.0	0.0	0.0	0.0	205.3	53.3	214.4	0.0	0.0	0.0	473.0
1967	0.0	0.0	0.0	0.0	0.0	46.6	163.9	0.0	0.0	0.0	0.0	0.0	210.5
1968	0.0	0.0	0.0	0.0	0.0	0.0	35.2	0.0	0.0	0.0	0.0	0.0	35.2
1969	0.0	0.0	0.0	0.0	0.0	0.0	86.3	0.0	76.7	0.0	0.0	0.0	163.0
1970	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.7	0.0	0.0	0.0	0.0	25.7
1971	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	144.3	0.0	0.0	0.0	144.3
1972	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1973	0.0	0.0	0.0	0.0	0.0	0.0	136.3	12.3	0.0	13.3	0.0	0.0	161.9
1974	0.0	0.0	0.0	0.0	0.0	0.0	0.0	122.5	0.0	0.0	0.0	0.0	122.5
1975	0.0	0.0	0.0	0.0	0.0	224.4	0.0	33.8	74.1	0.0	0.0	0.0	332.4
1976	0.0	0.0	0.0	0.0	0.0	0.0	221.2	0.0	30.3	0.0	0.0	0.0	251.5
1977	0.0	0.0	0.0	0.0	0.0	0.0	0.0	387.3	0.0	0.0	0.0	0.0	387.3
1978	0.0	0.0	0.0	0.0	0.0	0.0	125.1	109.4	0.0	0.0	0.0	0.0	234.6
1979	0.0	0.0	0.0	0.0	0.0	175.6	0.0	46.0	0.0	0.0	0.0	0.0	221.6
1980	0.0	0.0	0.0	0.0	0.0	0.0	0.0	112.6	0.0	0.0	0.0	0.0	112.6
1981	0.0	0.0	0.0	0.0	0.0	0.0	150.5	447.4	0.0	0.0	0.0	0.0	598.0
1982	0.0	0.0	0.0	0.0	0.0	0.0	0.0	41.0	0.0	0.0	0.0	0.0	41.0
1983	0.0	0.0	0.0	0.0	0.0	0.0	0.0	101.4	0.0	0.0	0.0	0.0	101.4
1984	0.0	0.0	0.0	0.0	0.0	0.0	0.0	164.6	0.0	0.0	0.0	0.0	164.6
1985	0.0	0.0	0.0	0.0	0.0	0.0	175.9	0.0	0.0	278.8	0.0	0.0	454.7
1986	0.0	0.0	0.0	0.0	0.0	0.0	300.8	726.4	0.0	0.0	0.0	0.0	1027.2
1987	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1988	0.0	0.0	0.0	0.0	0.0	0.0	110.5	142.6	0.0	207.6	0.0	0.0	460.7
1989	0.0	0.0	0.0	0.0	0.0	0.0	0.0	98.2	0.0	0.0	0.0	0.0	98.2
1990	0.0	0.0	0.0	0.0	0.0	92.2	251.8	910.3	0.0	0.0	0.0	0.0	1254.3
1991	0.0	0.0	0.0	0.0	0.0	0.0	66.1	352.1	0.0	0.0	0.0	0.0	418.2
1992	0.0	0.0	0.0	0.0	0.0	34.9	32.3	484.2	10.2	0.0	0.0	0.0	561.5
1993	0.0	0.0	0.0	0.0	0.0	0.0	115.1	11.0	0.0	0.0	0.0	0.0	126.0
1994	0.0	0.0	0.0	0.0	0.0	0.0	385.0	94.1	140.6	0.0	0.0	0.0	619.8
1995	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	144.7	173.5	0.0	0.0	318.2
1996	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1997	0.0	0.0	0.0	0.0	0.0	0.0	0.0	86.6	0.0	0.0	0.0	0.0	86.6
1998	0.0	0.0	0.0	0.0	0.0	0.0	24.4	0.0	58.1	0.0	0.0	0.0	82.5
1999	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2000	0.0	0.0	0.0	0.0	0.0	0.0	11.0	210.5	0.0	0.0	0.0	0.0	221.6
2001	0.0	0.0	0.0	0.0	0.0	43.7	0.0	0.0	0.0	0.0	0.0	0.0	43.7
2002	0.0	0.0	0.0	0.0	0.0	292.8	0.0	52.6	0.0	0.0	0.0	0.0	345.4
2003	0.0	0.0	0.0	0.0	0.0	0.0	83.2	225.0	0.0	0.0	0.0	0.0	308.2
2004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2005	0.0	0.0	0.0	0.0	0.0	0.0	660.2	185.8	0.0	0.0	0.0	0.0	846.0
2006	0.0	0.0	0.0	0.0	0.0	0.0	474.3	240.1	0.0	0.0	0.0	0.0	714.4
2007	0.0	0.0	0.0	0.0	0.0	512.6	201.6	119.3	58.3	0.0	0.0	0.0	891.9
2008	0.0	0.0	0.0	0.0	0.0	0.0	0.0	817.4	0.0	0.0	0.0	0.0	817.4
2009	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010	0.0	0.0	0.0	0.0	0.0	0.0	11.3	617.6	333.6	0.0	0.0	0.0	962.6
2011	0.0	0.0	0.0	0.0	0.0	0.0	0.0	94.3	0.0	0.0	0.0	0.0	94.3
2012	0.0	0.0	0.0	0.0	0.0	0.0	219.6	224.2	41.0	12.0	0.0	0.0	496.8
2013	0.0	0.0	0.0	0.0	0.0	49.3	710.4	241.0	0.0	0.0	0.0	0.0	1000.7
2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	387.1	0.0	0.0	0.0	387.1
2015	0.0	0.0	0.0	0.0	0.0	146.4	0.0	42.4	127.4	0.0	0.0	0.0	316.2
2016	0.0	0.0	0.0	0.0	0.0	384.8	608.1	0.0	46.9	0.0	0.0	0.0	1039.8
2017	0.0	0.0	0.0	0.0	0.0	0.0	85.8	0.0	0.0	0.0	0.0	0.0	85.8
2018	0.0	0.0	0.0	0.0	0.0	0.0	114.0	146.6	0.0	0.0	0.0	0.0	260.6
2019	0.0	0.0	0.0	0.0	0.0	0.0	15.1	26.2	0.0	0.0	0.0	0.0	41.4
2020	0.0	0.0	0.0	0.0	0.0	0.0	32.2	0.0	0.0	0.0	0.0	0.0	32.2
Grand Total	0.0	0.0	0.0	0.0	0.0	2591.9	6028.9	9297.0	2726.6	685.2	0.0	0.0	21329.5

Annexure 3.6

	Montly Discharge data of Sakhari Nallha												
	Month												
Year	**1.0**	**2.0**	**3.0**	**4.0**	**5.0**	**6.0**	**7.0**	**8.0**	**9.0**	**10.0**	**11.0**	**12.0**	Grand Tota
1952	0.0	0.0	0.0	0.0	0.0	0.0	178.6	684.0	209.7	0.0	0.0	0.0	1072.3
1953	0.0	0.0	0.0	0.0	0.0	86.3	230.7	2105.8	472.5	61.6	0.0	0.0	2956.9
1954	0.0	0.0	0.0	0.0	0.0	58.5	1166.3	406.1	980.6	0.0	0.0	0.0	2611.4
1955	0.0	0.0	0.0	0.0	0.0	998.0	361.5	387.4	312.5	94.6	0.0	0.0	2154.0
1956	0.0	78.8	0.0	0.0	0.0	2378.6	385.7	331.7	540.3	125.6	0.0	0.0	3840.7
1957	0.0	0.0	0.0	0.0	0.0	155.4	231.8	1368.2	349.0	0.0	0.0	0.0	2104.3
1958	0.0	0.0	0.0	0.0	0.0	0.0	786.9	1277.9	594.9	113.5	0.0	0.0	2773.2
1959	0.0	0.0	0.0	0.0	0.0	586.3	1186.4	1429.9	2589.6	0.0	0.0	0.0	5792.2
1960	0.0	0.0	0.0	0.0	0.0	598.2	866.9	422.4	0.0	0.0	0.0	0.0	1887.6
1961	0.0	0.0	0.0	0.0	0.0	22.7	355.1	2558.9	354.7	0.0	0.0	0.0	3291.5
1962	0.0	0.0	0.0	0.0	0.0	0.0	24.6	186.1	29.4	12.6	0.0	19.5	272.1
1963	0.0	0.0	0.0	0.0	0.0	117.3	543.3	1178.7	0.0	0.0	0.0	0.0	1839.3
1964	0.0	0.0	0.0	0.0	0.0	62.8	15.3	802.9	639.6	0.0	0.0	0.0	1520.6
1965	0.0	0.0	0.0	0.0	0.0	74.3	41.4	292.9	528.0	0.0	0.0	0.0	936.6
1966	0.0	0.0	0.0	0.0	0.0	0.0	1743.6	686.7	1324.6	0.0	0.0	0.0	3754.9
1967	0.0	0.0	141.9	0.0	0.0	1011.1	1051.5	636.4	0.0	0.0	0.0	0.0	2841.0
1968	0.0	0.0	87.3	0.0	0.0	165.6	548.1	207.7	409.6	0.0	0.0	0.0	1418.4
1969	0.0	0.0	0.0	0.0	0.0	0.0	694.4	135.3	663.0	0.0	0.0	0.0	1492.7
1970	0.0	0.0	0.0	0.0	0.0	141.0	302.3	999.6	446.8	0.0	0.0	0.0	1889.7
1971	0.0	0.0	0.0	0.0	0.0	404.1	0.0	303.9	627.4	0.0	0.0	0.0	1335.5
1972	0.0	0.0	0.0	0.0	0.0	254.4	562.9	240.8	0.0	0.0	0.0	0.0	1058.1
1973	0.0	0.0	0.0	0.0	0.0	0.0	1099.1	954.4	42.8	617.4	0.0	0.0	2713.6
1974	0.0	0.0	0.0	0.0	0.0	15.0	40.8	864.9	0.0	350.3	0.0	0.0	1271.0
1975	0.0	0.0	0.0	0.0	0.0	1493.9	339.0	727.0	999.3	19.0	0.0	0.0	3578.3
1976	0.0	0.0	0.0	0.0	0.0	0.0	1953.0	298.9	524.8	0.0	0.0	0.0	2776.7
1977	0.0	0.0	0.0	0.0	0.0	0.0	296.0	2232.1	13.5	0.0	0.0	0.0	2541.7
1978	0.0	0.0	0.0	0.0	0.0	161.4	1886.8	1443.0	0.0	0.0	0.0	0.0	3491.3
1979	0.0	0.0	0.0	0.0	0.0	1453.3	516.9	535.4	54.9	0.0	0.0	0.0	2560.5
1980	0.0	0.0	0.0	0.0	0.0	0.0	462.5	1155.0	147.6	0.0	0.0	0.0	1765.1
1981	0.0	0.0	0.0	0.0	0.0	227.3	1620.7	2016.9	296.5	0.0	0.0	0.0	4161.4
1982	0.0	0.0	0.0	0.0	0.0	0.0	227.0	370.1	277.7	233.1	0.0	0.0	1107.9
1983	0.0	0.0	0.0	0.0	0.0	175.5	447.8	1276.2	322.5	0.0	0.0	0.0	2221.9
1984	0.0	0.0	0.0	0.0	0.0	0.0	187.0	653.1	0.0	42.5	0.0	0.0	882.7
1985	0.0	0.0	0.0	0.0	0.0	387.5	1056.4	459.3	0.0	1365.7	0.0	0.0	3269.0
1986	0.0	0.0	0.0	0.0	0.0	158.2	1799.9	3249.2	107.9	0.0	0.0	0.0	5315.2
1987	0.0	0.0	0.0	0.0	0.0	144.8	270.1	516.4	0.0	0.0	103.4	0.0	1034.7
1988	0.0	0.0	0.0	0.0	0.0	55.5	1667.6	1110.1	40.4	900.7	0.0	0.0	3774.3
1989	0.0	0.0	0.0	0.0	0.0	245.7	408.9	1043.5	395.0	0.0	0.0	0.0	2093.2
1990	0.0	0.0	0.0	0.0	556.4	830.9	1196.4	3865.4	108.1	183.0	0.0	0.0	6740.3
1991	0.0	0.0	0.0	0.0	0.0	199.3	689.8	1491.5	0.0	0.0	0.0	0.0	2380.6
1992	0.0	0.0	0.0	0.0	0.0	830.6	573.4	2927.2	419.3	0.0	0.0	0.0	4750.5
1993	0.0	0.0	0.0	0.0	0.0	28.8	1382.8	304.4	206.6	0.0	0.0	0.0	1922.6
1994	0.0	0.0	0.0	0.0	0.0	322.5	2190.0	1024.4	715.6	250.9	0.0	0.0	4503.4
1995	93.6	0.0	0.0	0.0	0.0	466.3	950.2	423.4	793.5	1134.6	0.0	0.0	3861.5
1996	0.0	0.0	0.0	0.0	0.0	563.1	42.9	314.1	144.9	15.9	0.0	0.0	1081.0
1997	0.0	0.0	0.0	0.0	0.0	65.9	201.4	882.7	336.7	0.0	0.0	0.0	1486.7
1998	0.0	0.0	0.0	0.0	0.0	0.0	1262.9	174.6	592.9	0.0	0.0	0.0	2030.4
1999	0.0	0.0	0.0	0.0	0.0	557.7	162.7	390.9	223.3	62.9	0.0	0.0	1397.5
2000	0.0	0.0	0.0	0.0	0.0	410.2	700.2	1211.1	0.0	0.0	0.0	0.0	2321.5
2001	0.0	0.0	0.0	0.0	0.0	827.4	158.8	449.8	0.0	0.0	0.0	0.0	1436.1
2002	0.0	0.0	0.0	0.0	0.0	1703.7	333.1	505.6	0.0	0.0	0.0	0.0	2542.4
2003	0.0	0.0	0.0	0.0	0.0	0.0	1232.5	1183.1	0.0	114.9	0.0	0.0	2530.5
2004	0.0	0.0	0.0	0.0	0.0	11.2	0.0	277.3	0.0	0.0	0.0	0.0	288.5
2005	294.6	0.0	0.0	0.0	0.0	448.7	3173.4	799.8	118.8	253.8	0.0	0.0	5089.1
2006	0.0	0.0	0.0	0.0	0.0	364.7	2343.6	1162.0	174.2	227.1	0.0	0.0	4271.6
2007	0.0	0.0	0.0	0.0	0.0	2669.7	1847.3	978.5	761.8	31.0	0.0	0.0	6288.4
2008	0.0	0.0	0.0	0.0	0.0	342.3	490.2	3179.0	0.0	0.0	0.0	0.0	4011.5
2009	0.0	0.0	0.0	0.0	0.0	0.0	70.9	103.6	64.2	0.0	0.0	0.0	238.7
2010	0.0	0.0	0.0	0.0	0.0	45.8	1009.4	2948.9	1756.3	358.6	0.0	0.0	6119.0
2011	0.0	0.0	0.0	0.0	0.0	28.1	415.3	695.8	463.4	0.0	0.0	0.0	1602.6
2012	0.0	0.0	0.0	0.0	0.0	0.0	1455.3	1280.4	740.6	301.8	0.0	0.0	3778.1
2013	0.0	0.0	0.0	0.0	0.0	1106.2	3978.4	1303.5	436.3	299.3	0.0	0.0	7123.7
2014	0.0	0.0	0.0	0.0	0.0	15.6	137.5	291.5	1468.3	0.0	0.0	0.0	1912.9
2015	0.0	0.0	42.9	0.0	0.0	997.2	30.5	739.0	856.5	0.0	0.0	0.0	2666.2
2016	0.0	0.0	0.0	0.0	0.0	1837.4	2539.8	0.0	997.6	30.0	0.0	0.0	5404.8
2017	0.0	0.0	0.0	0.0	0.0	0.0	772.6	226.7	198.6	0.0	0.0	0.0	1197.9
2018	0.0	0.0	0.0	0.0	0.0	51.2	1715.8	1353.2	0.0	0.0	0.0	0.0	3120.1
2019	0.0	0.0	0.0	0.0	0.0	48.2	575.0	733.5	158.2	0.0	0.0	0.0	1515.0
2020	0.0	0.0	0.0	0.0	0.0	74.7	1151.6	178.8	0.0	19.7	0.0	0.0	1424.8
Grand Total	388.2	78.8	272.1	0.0	556.4	26480.0	58340.8	66948.7	26031.0	7220.3	103.4	19.5	186439.2

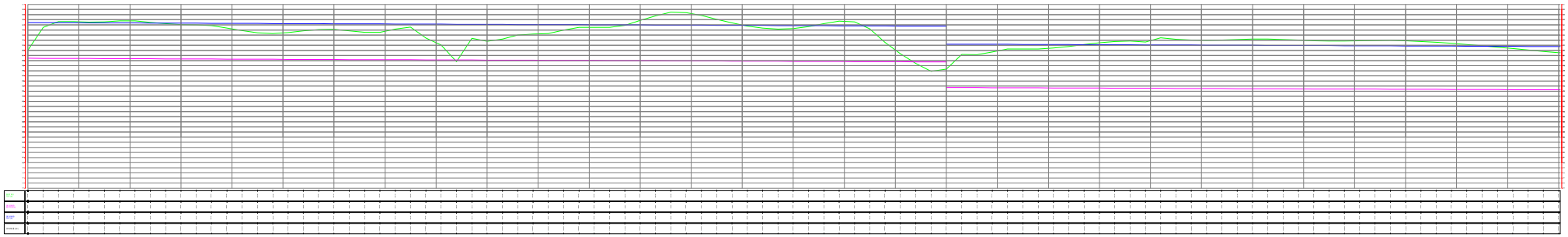
Annexure 4

Land Use Land Cover Map



Annexure 5.1

Gauri Nallha Longitudinal Profile 0 to 3km chainage

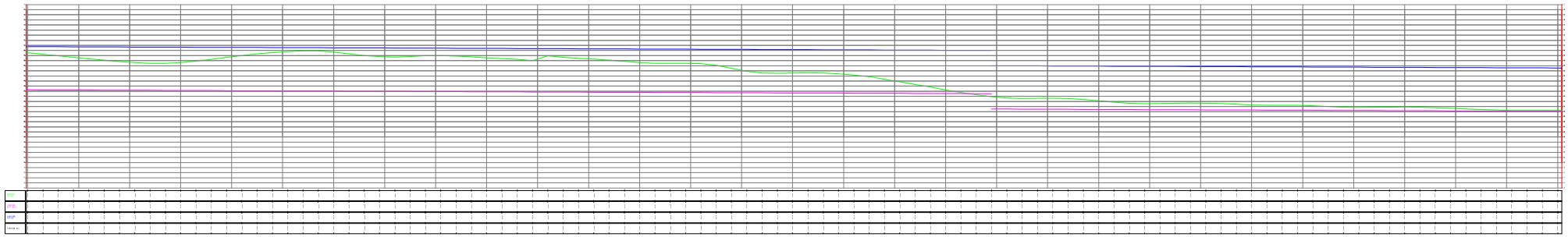


Project Title: Comprehensive hydraulic and drainage study of catchment area to assess the impact on the Nardha river as per EC condition of Expansion of Sarni OCP mine of Ballarpur Area, Western Coalfields Limited	
IIT Kharagpur	
Sheet Size A1	

Legend	
	Existing Level
	Designed Bottom
	Designed Top

Annexure 5.2

Gauri Nallha Longitudinal Profile 3 to 6km chainage

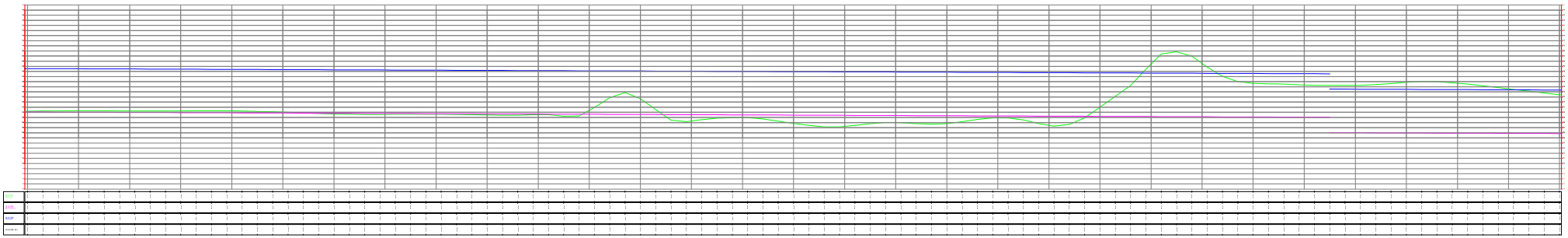


Project Title: Comprehensive hydraulic and drainage study of catchment area to assess the impact on the Wardha river as per EC condition of Expansion of Sasti OCP mine of Ballarpur Area, Western Coalfields Limited
IIT Kharagpur
Sheet Size A1

Legend	
	Existing Level
	Designed Bottom
	Designed Top

Annexure 5.3

Gauri Nallha Longitudinal Profile 6 to 9km chainage

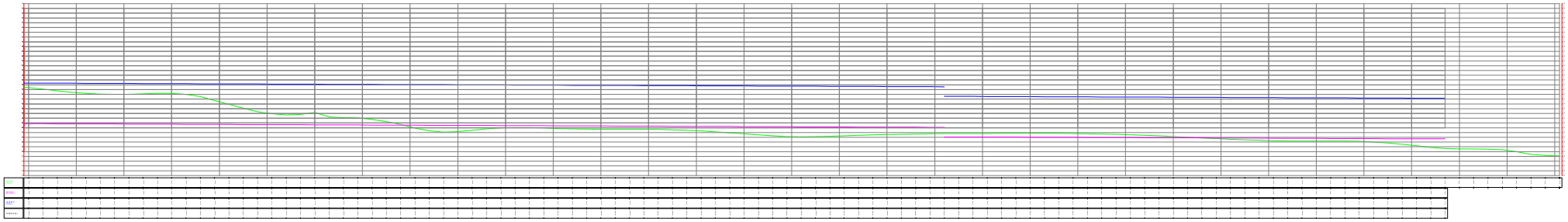


Project Title: Comprehensive hydraulic and drainage study of catchment area to assess the impact on the Wardha river as per EC condition of Expansion of Susti OCP mine of Ballarpur Area, Western Coalfields Limited	
IIT Kharagpur	
Sheet Size A1	

Legend	
	Existing Level
	Designed Bottom
	Designed Top

Annexure 5.4

Gauri Nallha Longitudinal Profile 9 to 12km chainage

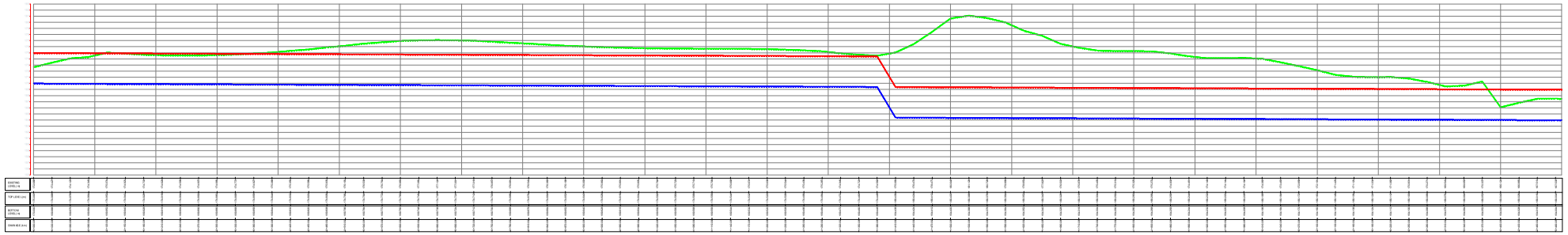


Project Title: Comprehensive hydraulic and drainage study of catchment area to assess the impact on the Nardha river as per EC condition of Expansion of Sasti OCP mine of Ballarpur Area, Western Coalfields Limited
IIT Kharagpur
Sheet Size A1

Legend	
	Existing Level
	Designed Bottom
	Designed Top

Annexure 6.1

Dhoptala Nallha Longitudinal Profile 0 to 2.5km chainage



Legend	
	Existing Level
	Designed Top
	Designed Bottom

Project Title: Comprehensive hydraulic and drainage study of catchment area to assess the impact on the Wardha river as per EC condition of Expansion of Sasti OCP mine of Ballarpur Area, Western Coalfields Limited

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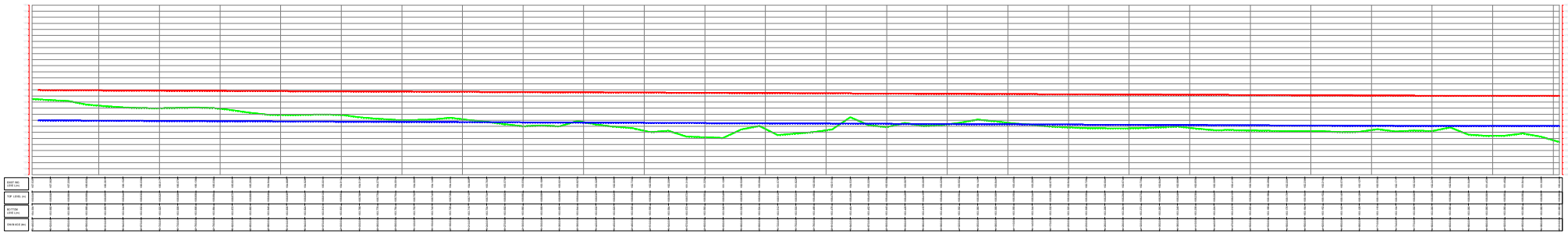
Annexure 6.2

Dhoptala Nallha Longitudinal Profile 2.5 to 5.01km chainage



Legend	
	Existing Level
	Designed Top
	Designed Bottom

Project Title: Comprehensive hydraulic and drainage study of catchment area to assess the impact on the Wardha river as per EC condition of Expansion of Susti OCP mine of Ballarpur Area, Western Coalfields Limited

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"केवल नागपुर कोर्ट के अधिकार क्षेत्र में"
वेस्टर्न कोलफिल्ड्स लिमिटेड
(मिनीरत्न कंपनी)(कोल इंडिया लिमिटेड की अनुषंगी कंपनी)
कार्यालय : क्षेत्रीय महाप्रबंधक, बल्लारपूर क्षेत्र
पोस्ट सास्ती, तह. राजुरा, जिल्हा चंद्रपूर (महाराष्ट्र)
फोन नं. 07173–230105, ई मेल–agmballarpur.wcl@coalindia.in

"Under Jurisdiction of Nagpur Court only"
Western Coalfields Limited
(A Miniratna Company)(A Subsidiary of Coal India Limited)
Office : Area General Manager, Ballarpur Area
Post Sasti, Tah. Rajura, Distt. Chandrapur (MS)
Ph. No. 07173-230105, E Mail-agmballarpur.wcl@coalindia.in

पंजीकृत कार्यालय : कोयला विहार, सिविल लाइन्स, नागपूर (महाराष्ट्र) – 440001
Regd. Office : Coal Estate, Civil Lines, Nagpur (MS) - 400001
CIN : U10100MH1975GOI018626
Website : www.westerncoal.in

संदर्भ क्र. वेकोलि/बक्षे/क्षेमहाप्र/345

दिनांक : 07/01/2025

प्रति,
Deputy Conservator of Forest,
Central Chanda, Chandrapur.

विषय : Approval of Wildlife Conservation Plan for Schedule – I species in the buffer zone of Sasti Expasion OC mine of Ballarpur Area.

महोदय,

As per the Environment Clearance condition for Sasti Expansion OC mine of Ballarpur Area no. 1.2 "*PP shall submit the proof of submission of Wildlife Conservation Plan for schedule I species to IRO and further deposit the allocated amount within six months.*"

As per Wildlife Protection Act 2022, following Schedule I are reported:

Name			WPA, 1972 Status	IUCN Status
Scientific	**English**	**Common / Hindi**		
Mammal				
Cuon alpinus	Wild dog	Jungli kutta	II	EN
Melursus ursinus	Sloth bear	Bhalu	I	VU
Panthera Pardus	Leopard	Tendua	I	VU
Panthera tigris	Tiger	Wagh	I	EN
Bird				
Pavo cristatus	Indian peafowl	Morr	I	LC

In this regard, Wildlife Conservation Plan has been prepared for the above species and submitted to your good office for obtaining competent approval.

भवदीय,

7/1/25
क्षेत्रीय महाप्रबंधक
वेकोलि, बल्लारपुर क्षेत्र

आवक लिपीक
मध्य चांदा वनविभाग
मुल रोड,चंद्रपूर 8/1/25

सत्यमेव जयते

File No.: J-11015/435/2006-IA.II(M)
Government of India
Ministry of Environment, Forest and Climate Change
IA Division
****

Dated **13/09/2023**

To,

Kaushik Chakraborty
Western Coalfields Limited
Coal Estate Civil lines, Nagpur-440001 Coal Estate Civil lines, Nagpur-440001, NAGPUR, MAHARASHTRA, Civil Lines, Nagpur, 440001
wclenv07@gmail.com

Subject: **Expansion of Sasti OCP for increase in ML area from 919.69 ha to 1120.48 ha with production capacity of 2.50 MTPA by M/s Western Coalfields Limited located in Village Sasti & Mathra, Tehsil Rajura, District Chandrapur (Maharashtra) – For Environmental Clearance - reg.**

Sir/Madam,

This is in reference to your application submitted to MoEF&CC vide proposal number IA/MH/CMIN/435209/2023 dated 01/07/2023 for grant of prior Environmental Clearance (EC) to the project under the provision of the EIA Notification 2006-and as amended thereof.

2. The particulars of the proposal are as below :

(i) EC Identification No.	EC23A0101MH5120135N
(ii) File No.	J-11015/435/2006-IA.II(M)
(iii) Clearance Type	Fresh EC
(iv) Category	A
(v) Project/Activity Included Schedule No.	1(a) Mining of minerals
(vi) Sector	Coal Mining
(vii) Name of Project	Sasti Expansion OCP for increase in ML area from 919.69 ha to 1120.48 ha keeping the existing production capacity of 2.50 MTPA located in Sasti & Mathra village, teh Rajura, Dist Chandrapur, Maharashtra
(ix) Location of Project (District, State)	CHANDRAPUR, MAHARASHTRA
(x) Issuing Authority	MoEF&CC
(xii) Applicability of General Conditions	No

2. The Ministry of Environment, Forest and Climate Change has considered the application. It is noted that

the proposal is for grant of Environmental Clearance to Expansion of Sasti OCP for increase in ML area from 919.69 ha to 1120.48 ha with production capacity of 2.50 MTPA by M/s Western Coalfields Limited located in Village Sasti & Mathra, Tehsil Rajura, District Chandrapur (Maharashtra).
The project/activity is covered under category 'A' of item1 (a) 'Mining of Minerals' the Schedule to the EIA Notification, 2006

3. The proposal was considered by the sectoral Expert Appraisal Committee (EAC) in its 47th EAC meeting held on 21 to 22 July, 2023 through Video Conferencing The details of the proposal, as ascertained from the proposal documents and as revealed from the discussions held during the meetings, are given as under:

1. The project area is covered under Survey of India Topo Sheet No 56 M/5 and is bounded by the latitudes from N 19^0 47' 18.24" to 19^0 49' 59.41" and longitudes E 79^0 17' 50.89" to 79^0 20' 1.17".
2. Coal linkage of the project is proposed for thermal use for MAHAGENCO & miscellaneous consumers.
3. There is no Joint venture.
4. Project does not fall in the Critically Polluted Area (CPA), where the MoEF&CC's vide its OM dated 13 January 2010 has imposed moratorium on grant of environment clearance.
5. Employment generation, Permanent employment to 710 persons will be provided from the project. In addition, approximately 200 Nos. of employment shall be provided by contractual HEMM operators.
6. The project is reported to be beneficial to bridge the gap (to the extent of the peak production capacity of the project) between demand & supply of non – coking coal for power plants & other consumers from Western as well as Southern part of the country. The domestic production of additional coal will reduce the impact of coal and save valuable foreign exchange. The CSR activities will provide development in the nearby villages.
7. The existing Sasti OC mine has been granted environment clearance by MoEF& CC vide ref no. J-11015/435/2006-IA.II (M) Dt. 17.05.2007 for production capacity of 2.50 MTPA within land area of 919.69 ha
8. Earlier, the ToR was issued by MoEF & CC vide its letter no. J-11015/537/2008-IA.II (M) dated: 02.01.2021 pertaining to Expansion of Sasti OC with a production capacity of 2.5MTPA with increase in mine lease area from 919.69 ha to 1120.48 ha. The said proposal is for grant of EC with a production capacity of 2.5MTPA with increase in mine lease area from 919.69 ha to 1120.48 ha.
9. Project has been applied for EC under EIA Notification, 2006.
10. Total mining lease area as per block allotment is 1120.48 ha. The present proposal is for EC with production capacity of 2.5MTPA with increase in land area 919.69 ha to 1120.48 ha. The Mining Plan along with mine closure plan for Sasti OC was approved by competent authority (i.e. WCL Board) for production capacity of 2.5MTPA with increase in mine lease area from 919.69 ha to 1120.48 ha area in its 345th meeting held on 19.09.2022 and communicated vide resolution no. WCL/Office of CS/BM-345/2022-23/499 dated 27.09.2022.
11. Total geological reserve reported in the mine lease area is 117.31 MT with 25.39 MT mineable reserve. Out of total mineable reserve of 25.39 MT, 24.12 MT are available for extraction. Percent of extraction is 95%.
12. One composite seams with thickness ranging from 6.34m to 19.05m are workable. Declared Grade of coal is G9 stripping ratio 1:9.47 m^3/t, while gradient is 1 in 7.4 to 1 in 18.
13. Method of mining operations envisages by opencast with surface miner- an ecofriendly technology.
14. Life of mine is 11 years.
15. The project has 7 external OB dumps in an area of 202.52 ha with 60 m max. height and 46.85 Mm^3 of OB. 1 internal OB in an area of 275.89 ha with 90m height and 171.54 Mm^3 of OB is envisaged in the project.
16. Total quarry area is 544.79 ha out of which backfilling will be done in 275.89 ha while final mine void will

be created in an area of 268.90 ha with a depth of 200 m. Backfilled quarry area of shall be reclaimed with plantation after completion of entire mining operation. Total plantation at post mining would be 686.41 ha. Final mine void will be converted to water body.

17. Transportation of coal has been proposed by dumpers in mine pithead, from surface to siding by trucks and at sidings by railways. Proposed change in transportation means are as follows: New railway siding will be constructed within existing ML area. About 2.5 km of new railway track will be required to lay upto new siding from main line. Trucks will dump coal on the elevated platform to create stock along the railway siding. Coal from the stock will be loaded into railway wagons with the help of pay loaders/front end loaders.

18. It was noted that in the interim period till construction of railway siding within ML area of Sasti OC, a railway siding at Gauri Deep OC (Distance – 6.2 kms) is proposed to be constructed. This railway siding is likely to be operationalized by August, 2023. It is proposed to install wind barrier system and rain guns for pollution control mitigation measures at Gauri Deep Railway siding with capital of 282.0 Lakhs. New railway siding will be constructed in western side of the proposed quarry beyond fault F8-F8 within existing ML area. The New Railway Siding within ML area of Sasti OC will be operationalized by March, 2026

19. Reclamation Plan in an area of 686.41 ha, comprising of 202.52 ha of external dump, and 275.89ha in internal dump. In addition to this, an area of 36 ha, included in the undisturbed area/ built up area/ township/embankment area, and also172.0 ha has been proposed for green belt development. Plantation on External dump will be carried out when the dump reaches the stipulated height as per Mining Plan and physical reclamation is completed.

20. There is no forestland has been reported to be involved in the project.

21. No National Parks, Wildlife Sanctuaries and Eco-Sensitive Zones fall within 10 km boundary of the project.

22. There are Four Schedule-I species recorded in the study area namely Tiger, Sloth Bear, Leopard and wild dog. The conservation plan with capital outlay of 1.59 Crore is proposed on conservation measures.

23. The ground water level (m) varying in core and buffer zone : Pre-Monsoon : Core zone: 6.60m to 8.60 m; Buffer zone : 2.32 to 12.50 m; Post-Monsoon : Core zone : 3.90m to 6.48m; Buffer zone : 0.98 m to 9.83 m

24. Total water requirement for industrial purposes is 620 KLD and 474 KLD for residential requirement.

25. The project has been granted NOC for ground water abstraction by CGWA vide NOC no CGWA/NOC/MIN/ORIG/2021/12462 dated 03.08.2021 and valid upto 02.08.2023.

26. In compliance with the ToR condition 40 regarding Public Hearing: Date and Venue of Public Hearing: Public Hearing has been successfully conducted on 16.03.2023 by Maharashtra Pollution Control Board at at Manoranjan Kendra, WCL, Sasti Colony, Village Dhoptala, Tehsil – Rajura, District Chandrapur, Maharashtra.

27. Major issues raised in the public hearing include Employment, CSR, land acquisition, Environment Pollution etc.

28. A total provision of Rs.113.33 lakhs has been envisaged in the capital expenditure for compliance of issue raised during Public Hearing etc and will be implemented as per the assurances given by PP during Public hearing.

29. Consent to Operate for the existing capacity of 2.5 MTPA was obtained from the State PCB on 27.02.2023 valid upto 31.12.2023.

30. Gauri Nallah and Sasti (Shivnal) Nallah flows through the project area and Sakhari nallah flows along the mine boundary of the project. In the coal conservation point of view, 2.60 km and 2.70 km diversion of Gauri nallah and Sasti (Shivnal) nalla is proposed in the proposal respectively. There is also proposal for widening of sakhari nallah for 1.50 km.

31. Baseline Data monitoring has been carried out from 1 October to 31 December 2020. 12 nos. of sampling

location monitored during the Baseline Study. All the parameters have been found to be within the permissible limits. Regular monitoring of ambient air quality is being carried out on fortnightly basis. The documented report is submitted to MPCB and also to MoEF&CC along with half yearly EC compliance report.

32. No court cases, violation cases are pending against the project of the PP.

33. The project does not involve violation of the EIA Notification, 2006 and amendment issued thereunder. The coal production from the mine was started from the year 1985-86 onwards. Excess production from the mine was realized from 1994-95 to 2004-05 w.r.t. the EC granted on 3rd April, 1989 for production capacity of 1.0 MTPA. Subsequently, the application under post facto clearance for expansion in production capacity from 1.00 MTPA to 1.60 MTPA was submitted to MoEF&CC in 2004. The Environment clearance was issued on 19th May 2005 for production capacity of 1.60 MTPA after deliberation in EAC meetings. No excess production of coal from the sanctioned capacity has been realized since grant of EC in 2005-06. The project was subsequently submitted again for expansion in production capacity from 1.60 MTPA to 2.50 MTPA and EC for expansion capacity was granted on 17 May 2007.

34. Project does not involve resettlement of the any villages.

35. Total cost of the project is Rs. 37159.29 Lakhs. Cost of production is Rs.1544.06 per tonne., CSR cost is Rs. 2 per tonne, and no R&R cost as no village rehabilitation is proposed. Environment Management Cost - Capital Rs.1250.06 Lakh & Recurring cost is 6/tonne of coal production

36. Consent to Operate for the existing capacity of 2.5 MTPA was obtained from the State PCB on 27.02.2023 valid upto 31.12.2023.

37. The additional details of project is produced at Annexure-2 & Annexure-3.

4. The Expert Appraisal Committee in its 47th EAC meeting held during 21-22 July, 2023 through Video Conferencing has recommended the project for grant of Environment Clearance (EC). Based on recommendations of the EAC, Ministry of Environment, Forest and Climate Change hereby accords approval for Environment Clearance(EC) to **Expansion of Sasti OCP for increase in ML area from 919.69 ha to 1120.48 ha with production capacity of 2.50 MTPA by M/s Western Coalfields Limited located in Village Sasti & Mathra, Tehsil Rajura, District Chandrapur (Maharashtra),** under the provisions of the Environment Impact Assessment Notification, 2006 and subsequent amendments/circulars thereto subject to the compliance of the terms & conditions / specific conditions at Annexure-I in addition to the standard environmental conditions notified by the Ministry.

5. This issue with an approval of the Competent Authority.

Copy To

1. The Secretary, Ministry of Coal, Shastri Bhawan, New Delhi
2. The Principal Secretary, Department of Environment, Government of Maharashtra, 15th Floor, New Admn. Bldg, Madam Cama Road, Mantralaya, Mumbai - 32 (Maharashtra)
3. The Chairman, Maharashtra State Pollution Control Board, Kalapataru Point, 3rd & 4thFloors, Sion, Matunga Scheme Road No. 8, Opp. Cine Planet Cinema, Near Sion Circle, Sion (E), Mumbai - 2
4. The District Collector, **Chandrapur.** Government of **(Maharashtra)**
5. Deputy Director General of Forests (C), Ministry of Env., Forest and Climate Change, Integrated Regional Office, Ground Floor, East Wing, New Secretariat Building, Civil Lines, Nagpur- 440001 (Maharashtra)
6. The Chairman, Central Ground Water Authority, Ministry of Jal Shakti, Jamnagar House, 18/11, Man Singh Road Area, New Delhi, Delhi 110001

7. Monitoring File 8. PARIVESH

Annexure 1

Specific EC Conditions for (Mining of minerals)

1. Additional specific Condition

S. No	EC Conditions
1.1	PP shall conduct comprehensive hydraulic and drainage study of catchment area to assess the impact on the wardha river within a year and submit the report to IRO.
1.2	PP shall submit the proof of submission of Wildlife Conservation Plan for schedule I species to IRO and further deposit the allocated amount within six months.
1.3	PP shall carry out the mining activity at a safe distance of 100m from Gauri Nallah/ Wardha River flowing through mine lease area or adjacent to the lease area. In any circumstances, PP shall not divert any streams flowing within/adjacent to the mine lease area till no comprehensive study as stated above is done.
1.4	PP needs to extract the seepage ground water from the mine and treat it through ETP so that the water can be further utilize in the Mine as well for the local villagers.
1.5	PP shall implement dedicated inpit conveyor belt with silo loading system till railway siding on or before December, 2025. Accordingly, SPCB may grant CTO to strictly comply this condition.
1.6	The truck size of 40 tonne (payload) for the transportation of coal shall be deployed through dedicated road till commissioning of SILO with rapid loading system on or before December, 2025 accordingly SPCB may issue the CTO.
1.7	PP has to resolve suggestions/objections raised during the public hearing along with implement activities-wise proposed budget of Rs. 113.33 Lakhs (as Public Hearing Budget), Rs. 1250 Lakhs (as EMP cost) in time bound manner as per s.no. (xvi) & (xvii) of para 47.1.3 of MoM of the EAC meeting. The details of annual expenditure shall be part of report submitted to IRO, MoEF&CC. PP needs to include the audited figures against the expenditure and activities to be monitored by through dedicated online monitoring mechanism. The maintenance of all activities shall be covered through recurring cost of Public Hearing, which will be part of CSR budget.
1.8	PP has to implement capital budget upto Rs. 1341.37 lakh for implementing additional air pollution control measures, Rs. 125 lakhs for mitigation of water pollution in time bound manner as per s.no. (xiii) & (xix) of para 47.1.3 of MoM. It shall be monitored by IRO, MoEF&CC.
1.9	Install dust barrier (made up of natural fibre) with automatic fixed type sprinkling system across the village area/sensitive area.
1.10	PP shall increase number of fixed type sprinkling system (near to haul road, stockyard, transportation route etc.) across the mine lease area in order to arrest the dust coming out from the mining activities.
1.11	Implement the integrated transportation system with Dhuptala OC mine locating near to the existing

S. No	EC Conditions
	mine owned by M/s Western Coalfields limited.
1.12	PP shall install additional Continuous air quality system at different locations near to village area and share online data with SPCB as well as with CPCB.
1.13	Afforestation activity shall cover area not less than 600 ha, including reclaimed external OB dump, backfilled area, along ML boundary, along roads & infrastructure, township area. The density of the trees should be around 2500 plants per ha.
1.14	PP shall conduct special drive for villages such as Sasti, Gauri, Pauni and other nearby villages for air pollution mitigation measures and no coal storage yard, OB dump shall be dumped near to the villages.
1.15	Water storage ponds shall be constructed of appropriate depth in nearby village in collaboration with Gram Panchayat
1.16	PP shall increase the bed capacity of the existing Hospital from 25 to 50 bedded at Sasti Township and allow local villager to avail the hospital facility. Quarterly health check- up campaign shall be conducted in all the villages located in 10 km buffer area.
1.17	PP shall construct 25-sitter digital library in each village including the daily newspaper facility.
1.18	PP shall create a "**Public Grievance Redressal and Monitoring System**" for resolving any issues related to the pollution of mines and complaint has to resolve as soon as possible not beyond 30 days. In this regard, adequate awareness to be spread among the public to address their grievance to company with simple and easy manner and for which company needs to devise the mechanism. The same shall be reported to IRO within 3 months. A logbook to be maintained by PP on "**Public Grievance Redressal and Monitoring System**."
1.19	PP shall conduct third party audit of compliance of EC condition at an interval six months and its report shall be submitted to IRO, MoEF&CC.
1.20	The status of mine closure activities must be included in every six months compliance report submitted to the state pollution control board and IRO.
1.21	PP to maintain the topped haul road properly to minimized the dust emission. PP to also develop pucca roads by seeking consent from the panchayat with widening of roads especially roads inter linking the villages within the study area of 10 km radius buffer zone.
1.22	PP to install solar lights along the road used for transportation of minerals to avoid the accidents at night and also seek its maintenance. PP is asked to also identify the rural areas for installation of solar light with its maintenance within the study area of 10 km radius buffer zone within one year.
1.23	PP to provide bio toilets to the villages located within the study areas within 1 year from the grant of this EC.
1.24	PP shall conduct feasibility studies for assessment of voids for backfilling of ash and mixing of ash with overburden, taking up backfilling ash and OB mixing activities during operations as well as post closure of mines in line with the Fly Ash Utilization Notification, 2021

S. No	EC Conditions
1.25	PP shall pay to farmers of agricultural land if there is any loss due to pollution found by concerned District Commissioner as per extent rules or norms
1.26	PP shall deploy atleast 20% of overall fleet of dumpers/trucks/other vehicles as electrical or CNG/LNG based for transportation of coal/OB etc.

Annexure 2

Details of the Project

<table>
<tr><th>S. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>a.</td><td>Details of the Project</td><td>Sasti Expansion OCP for increase in ML area from 919.69 ha to 1120.48 ha keeping the existing production capacity of 2.50 MTPA located in Sasti & Mathra village, teh Rajura, Dist Chandrapur, Maharashtra</td></tr>
<tr><td>b.</td><td>Latitude and Longitude of the project site</td><td>19.788672850469, 79.2977166466971 19.8330341537081, 79.3335429628642</td></tr>
<tr><td>c.</td><td>Land Requirement (in Ha) of the project or activity</td><td><table><tr><th>Nature of Land involved</th><th>Area in Ha</th></tr><tr><td>Non-Forest Land (A)</td><td>1120.48</td></tr><tr><td>Forest Land (B)</td><td>Nil</td></tr><tr><td>Total Land (A+B)</td><td>1120.48</td></tr></table></td></tr>
<tr><td>d.</td><td>Date of Public Consultation</td><td>Public consultation for the project was held on 2023-03-16</td></tr>
<tr><td>e.</td><td>Rehabilitation and Resettlement (R&R) involvement</td><td>NO</td></tr>
<tr><td>f.</td><td>Project Cost</td><td>37159.29</td></tr>
<tr><td>g.</td><td>EMP Cost</td><td>1250.6</td></tr>
<tr><td>h.</td><td>Employment Details</td><td>710</td></tr>
</table>

Annexure

The land usage pattern of the project is as follows:

Pre-Mining

Sl. No.	Type of Land	Area (in Ha)
1	Tenancy land	1085.98
2	Forest land	0.00
3	Govt. land	34.50
	Total	**1120.48**

Post Mining

Sl. No.	Land use during mining	Land use (ha)				
		Plantation	Water Body	Public use	Undisturbed	Total
1	External OB Dump	149.54	-	-	-	149.54
2	Top Soil Dump	52.98	-	-	-	52.98
3	Excavation	275.89	268.90	-	-	544.79
4	Roads	5.00	-	15.00	-	20.00
5	Built up area (Infrastructure)	20.00	-	39.52	-	59.52
6	Undisturbed Area	172.00	-	-	67.25	239.25
7	Embankment around quarry	10.00	-	27.80	-	37.80
8	Outside ML Area	1.00	-	15.60	-	16.60
	Total	**686.41**	**268.90**	**97.92**	**67.25**	**1120.48**

Revised budget of Rs. 1341.37 Lakh for implementing the additional mitigation measures such as:

Particular/Location	Existing Mitigation Measures	Mitigation Measures proposed and presented in 47 EAC	Capital Provision made (in Lakhs)	Modification in Mitigation Measures as directed in 47 EAC	Modified Capital Provision made (in Lakhs)
Mobile Water Sprinklers along Haul road, Coal stockyard, Weigh bridge, Coal transportation road	Presently 05 Nos. of Mobile Water Tankers are provided for dust suppression	Provision for 2 Nos of 28 KL Mobile Water Sprinklers is made (Replacement) Hiring of mobile water sprinklers will be continued in future also.	408.26	a) 3 Nos- 28 KL: In the mine for controlling dust in and around the project. b) 2 Nos- 16 KL : From Sasti mine to Mathra village turning (i.e 3 km road patch of coal transportation route)	608.26
Fixed Water Sprinklers along Haul road, Coal stockyard, Weigh bridge, Coal transportation road	35 Nos of Fixed Sprinklers Provided	Provision made for Additional Fixed Sprinklers and Fogging Machine	80.00	Provision made for Additional Fixed Sprinklers a) covering remaining 3 kms of coal transporta2on route from mine to Gouri deep siding – 75 nos with 15 meters of throw b) Covering coal stock yard of Sasti Expansion OCM with 20	150

				sprinklers c) Installation of Rain guns at Gauri Deep railway siding - 16 nos.	
Road Sweeping Machine	To be provided	It is proposed to introduce road sweeping machine for removal of dust from coal transportation route	43.11	a) 1 no proposed for Sasti Expansion OC Project.	43.11
				b) Additional 4 nos in neighboring mines. One no. bromming machine in Gauri deep, Pauni II, Gauri Pauni, Ballarpur OC	80.00
Fogging Machine	To be provided	For suppression of dust, fogging machine is proposed in the mine	60.00	7 no's of trolley mounted fogger with 100 m throw.	70.00
Greenbelt	Area not less than 500 ha and around 2500 plants per ha	The greenbelt in the dip side along the area of expansion will be developed.	70.00	Covering 6 kms of coal transportation route from mine to Gouri deep siding – approx. 5000 no's bamboo plantation and also inside mine lease area along the embankment, OB dumps etc	70.00

Continuous Ambient Air Quality Monitoring Station	1 nos of CAAQMS has been installed in nearby mine Pauni-II Expansion OC.	1 nos of CAAQMS is proposed to installed for Sas2 Expansion OC Mine.	75.00	1 no of CAAQMS is proposed to be installed for Sasti Expansion OC Mine.	75.00
Dust Barrier				Dust Barrier along the coal transportation road to protect Goyegaon village of 12 feet height for 750 m patch on initial basis.	75.00
				Wind barrier is under final stage of completion of height aprox. 18 feet. Along the railway track (1km length) to control dust pollution.	170.00
Total Capital Provision made in Project Report			**736.37**		**1341.37**

Rs. 125 Lakhs has been proposed for mitigation of water pollution are as follows:

Particular	**Existing Control Measure**	**Proposed Control Measure**	**Capital provision made in approved Expansion Project Report (in Lakhs)**
Workshop Effluent waste-water	A ETP of 150 KL is in operations at existing Sasti OC.	Capital provision of 25.0 Lakhs has been made for repair/upgradation of ETP in the approved Project Report.	25.00
Mine Water	A sedimentation	Capital provision of 25.00	25.00

	tank is in operation in existing Sasti OC.	Lakhs has been made for the additional sedimentation tank.	
Sewage Treatment Plant	1 MLD Sewage Treatment Plan is in operation at Sasti Township.	Provision of 75 Lakhs has been made for repair/upgradation of existing 1 MLD STP.	75.00
Total Capital Provision Made (Additional)			**125.00**

Rs. 1250 Lakhs proposed w.r.t. Environmental Management as follows:

Sl. No.	Particulars	Amount (Rs. Lakhs)	Timeline
1	Sedimentation Pond upgradation for Treatment of Mine Waste water	25	2023-24
2	Effluent Treatment Plant upgradation for treatment of Workshop Effluent	25	2023-24
3	Base Line Environment Data Generation	15	Generated
4	Fogging machines for Dust control measures.	60	2023-24
5	Digital Mapping for Land Use Plan	15	Completed
6	Continuous Ambient Air Quality Monitoring Station (CAAQMS)	75	2023-24
7	Sewarage Treatment Plant	75	2024-25
8	Installation of fixed type sprinklers on haul roads, transportation of coal route, CHP loading & unloading points and other dust generation sources etc.	80	2022-24
9	10-30m of three tier plantations for green belt along mine boundary for approx 14.00 km to control air pollution	70	2022-25
10	Health check-up for Occupational diseases as per EC Condition	30	Continued
11	Scientific Studies	15	2023-24
12	Installation of Piezometers with telemetry	25	2022-23
13	Fund for Wild Life Conservation	100	2023-24
14	Provision for Compliance of issue raised during Public Hearing etc	100	2022-25

15	Misc. Provisions for fulfillment of statutory requirements under environment clearance, CTE, CTO, ground water clearance or as per directives of SPCB/MoEF&CC.	67.51	2022-26
Appendix – A.3.1 of Project Report			
16	2 nos of 28 KL Mobile Water Sprinklers with mist spray (Replacement)	408.26	2024-25
17	Road Sweeping Machine	43.11	2023-24
Appendix – A.3.2 of Project Report			
18	Energy Conservation	21.18	Continued
	Total	**1250.06**	

Budget of Rs.113.33 lakhs proposed as capital expenditure for compliance of issue raised during Public Hearing and their action plan has been mentioned below:

Sl. No.	**Particulars**	**Location (Name of School /Village/Area)**	**FY 2022-23 (In Lakhs)**	**FY 2023-24 (In Lakhs)**
1	Infrastructure creation for Drinking Water supply	Goyegaon		3
		Rampur	5.32	
		Mathra	5.99	
		Dhidsi	5.99	
2	Sanitation	Ballarpur Area	1.5	
		Nearby Villages		6
3	Education	Manoli	0.58	
		Chincholi		7
		Gauri		5
		Chunala		30
4	Skill Development	Ballarpur Area		
12	Avenue plantation			2
14	Infrastructure	Chincholi		
		Mathra		20
		Gouri	0.68	
15	Health	Balarpur area	2	
		Sasti	0.17	5
		Sakhari		
		Mathra		4
		Gauri		4
		Nearby Villages		2
16	Art, Culture & Sports	Ballarpur Area	3	
	Total		**25.23**	**88**

The grant of Environmental Clearance is further subject to compliance of the Standard EC conditions as under:

(a) Statutory compliance

(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.
(ii) The project proponent shall obtain clearance from the National Board for Wildlife, if applicable.
(iii) The project proponent shall prepare a Site-Specific Conservation Plan / Wildlife Management Plan and approved by the Chief Wildlife Warden. The recommendations 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-I 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.
(v) The project proponent shall obtain the necessary permission from the Central Ground Water Authority.

(vi) Solid/hazardous waste generated in the mines needs to addressed in accordance to the Solid Waste Management Rules, 2016/Hazardous & Other Waste Management Rules, 2016.

(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 PM_{10}, $PM_{2.5}$, SO_2 and NO_x. 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.

(ii) 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.

(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 $PM_{10}/PM_{2.5}$) 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.

(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 a 'bypass' road, it should be so 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.

(vi) Coal stock pile/crusher/feeder and breaker material transfer points shall invariably be provided with dust suppression system. Belt-conveyors 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.

(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.

(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.

(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-lA.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.

(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 and 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.

(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.

(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.

(vi) Catch and/or garland drains and siltation ponds in adequate numbers and appropriate size shall be constructed around the mine working, 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 be 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.

(vii) Adequate groundwater recharge measures shall be taken up for augmentation of ground water. The project authorities shall meet water requirement of nearby village(s) after due treatment conforming to the specific requirement (standards).

(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.

(ix) The water pumped out from the mine, after siltation, shall be utilized 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.

(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/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.

(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 rivarine/riparian ecosystem conservation and management plan should be prepared and implemented in consultation with the irrigation / water resource department in the state government.

(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.

(ii) Controlled blasting techniques shall be practiced in order to mitigate ground vibrations, fly rocks, noise and air blast etc., as per the guidelines prescribed by the DGMS.

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

(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.

(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).

(iii) No mining shall be carried out in forest land without obtaining Forestry Clearance as per Forest (Conservation) Act, 1980.

(iv) Efforts should be made to reduce energy and fuel consumption by conservation, efficiency improvements and use of renewable energy.

(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 1:50,000 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).

(ii) 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.

(iii) 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-a-vis the post mining land use pattern shall be submitted to the MOEFCC/RO.

(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 MoEF&CC, CPCB and SPCB.

(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 top soil 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.

(vi) The project proponent shall make necessary alternative arrangements, if grazing land is involved in core zone, in consultation with the State government to provide alternate areas for livestock grazing, if any. In this context, the project proponent shall implement the directions of Hon'ble Supreme Court with regard to acquiring grazing land.

(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.

(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 along the major approach/ coal transportation roads.

(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.

(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, 1955 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, if any, as amended time to time.

(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.

(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 Government, as applicable.

(v) The project proponent shall follow the mitigation measures provided in this Ministry's OM No.Z-11013/5712014-IA.I1 (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'.

(i) Corporate Environment Responsibility

(i) 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.

(ii) 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.

(iii) 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 Compliance Report.

(iv) Self environmental audit shall be conducted annually. Every three years third party environmental audit shall be carried out.

(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.

(ii) The copies of the environmental clearance shall be submitted by the project proponents 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.

(iii) The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.

(iv) The project proponent shall monitor the criteria pollutants level namely; PM_{10}, SO_2, 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.

(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.

(vi) The project proponent shall follow the mitigation measures provided in this Ministry's OM No.Z-11013/5712014-IA.I1 (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'.

(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.

(viii) The project authorities shall inform to the Regional Office of the MOEFCC regarding commencement of mining operations.

(ix) The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.

(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.

(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.

(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.

(xiii) The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.

(xiv) The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.

(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.

(xvi) The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, 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 commitments 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.

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.

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.

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 & others.

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.

10. This environmental clearance 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.

11. All other conditions stipulated in the EC vide its letter J-11015/435/2006-IA.II (M) dated 17.05.2007, shall remain unchanged.

Signed by
Lalit Kumar Bokolia
Date: 13-09-2023 17:03:34
Reason: Verified and signed

WILDLIFE CONSERVATION PLAN

Sasti Expansion Opencast Coal Mine

Ballarpur Area
WESTERN COALFIELDS LIMITED

Sasti Village, Tehsil Rajura, District: Chandrapur, Maharashtra

Jan'2025

PREFACE

Wildlife conservation is essential for preserving the health of ecosystems, maintaining biodiversity, and ensuring that future generations can enjoy a planet rich in natural beauty and resources. Every organism and its variation are unique and have its own role to play in a particular ecological niche. A long-term Wildlife Management Plan for protection and conservation is the need of the hour to save wildlife from extinction.

This Wildlife Conservation Plan aims to create a sustainable framework for protecting the species, with a focus on the most vulnerable and threatened populations. The plan includes a series of strategic actions designed to address the root causes of biodiversity loss, improve habitat conservation efforts, foster community involvement, and ensure that conservation efforts are supported by scientific research and adequate funding.

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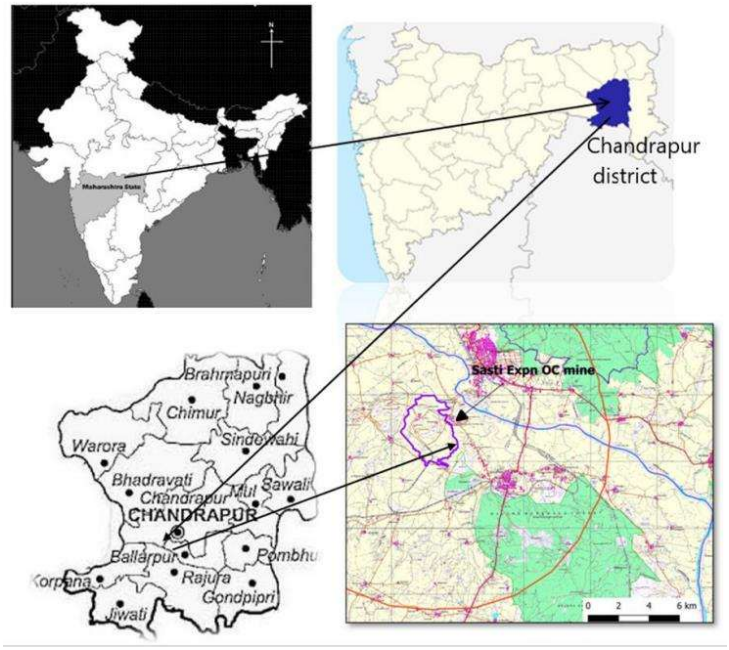
1. PROJECT DESCRIPTION AND NEED FOR WILDLIFE CONSERVATION PLAN:

- The proposed Sasti Expansion OC mine is located near Sasti village in Rajura Tehsil of Chandrapur district of Maharashtra State. The present proposal is dip side extension of existing Sasti OC mine in combined Sasti and Mathara geological block. This combined geological coal block is in the eastern limb of the Wardha Valley Coalfield. The Rajura and Ballarpur townships are located at approx. 4 kms from the project. The Chandrapur district township is located at the distance of about 23 km from the mine.

- Project report for expansion of mine was prepared keeping the existing production capacity of 2.50 MTPA with increase in ML area from 919.69 ha to 1120.48 ha. The project report was approved by WCL Board vide REF: WCL/Office of CS/BM-324/2020-21/336 dated 17.08.2020. Based on the approved Project Report, the Form-I application was submitted to MoEF&CC in December 2020. The ToR was issued by MoEF&CC vide Letter No. J-11015/435/2006-IA. II(M) dated 02.01.2021. Environment Clearance has been granted by MoEFCC vide J-11015/435/2006-IA.II(M) dated 13/09/2023 for production capacity of 2.5MTPA in mine lease area of 1120.48 ha.

- The mine is bounded by Latitude N 19° 47’ 18.24” and N 19° 49’ 59.41” and Longitude E 79° 17’ 50.89” and E 79° 20’ 1.17”. It is covered in the survey of India Toposheet No. - 56 M/5.

Figure 1 Plan specifying location of State, District and Project



- There is no Forest land involved within the Mine lease area of 1120.48 Ha. The proposed rated output of mine is 2.50 MTY, the total life of the mine is 11 years. Total geological reserve reported in the mine lease area is 25.39 MT with 24.12 MT mineable reserve.

- Cost of production is Rs. 1460.12 per tonne. The project is reported to be beneficial to bridge the gap (to the extent of the peak production capacity of the project) between demand & supply of non – coking coal for power plants & other consumers from Western as well as Southern part of the country. The domestic production of additional coal will reduce the impact of coal and save valuable foreign exchange. The CSR activities will provide development in the nearby villagesa and a capital provision of Rs. 540 lakhs have been made against environment protection for the proposed project.

- Total 236.16 Mm3 of overburden will be produced during the expansion of project. Out of above, 220.68 Mm3 (93%) of overburden is proposed to be dumped internally in the void. Only 7% OB will be dumped externally (including embankment) by increasing the height of the existing external dumps.

- Backfilled quarry area of shall be reclaimed with plantation after completion of entire mining operation. Total plantation at post mining shall be 686.41 ha. Final mine void of 268.90 ha will be converted to water body and 97.93 ha of land shall be converted for Public use.

- There are 05 Schedule-I species found in the study area viz., Leopard, Tiger, Indian Peafowl, Sloth Bear, and Wild Dog with other animals are also listed of the Wildlife (Protection Act),1972.

2. FLORA FAUNA OF STUDY AREA

Flora and Fauna both are essential for humans. Flora and fauna are interdependent for source of oxygen and carbon di oxide on each other for survival. Conservation of flora and fauna is thus necessary for maintaining ecological balance. Identification of species will help the restoration process to minimize environmental damage due to mining activities.

This study is conducted to identify the presence of floral and faunal species within the study area. Baseline data of flora and fauna of a project must be generated for the preparation of Environmental Impact Assessment (EIA) report. Data of endangered / endemic species of Flora and Fauna, migratory species of Fauna, migratory corridors, breeding and spawning grounds if present, will help for preparation of conservation plan for the same.

Flora is a collective term for a group of plant life found in a particular region. Fauna represents the animal life indigenous to a region. Flora and fauna form the two most important natural resources. They are important because they contribute, even if in a very small way, something of value to something else.

The more animals and plants we lose, the fewer there are to contribute to individual ecosystems. The more individual ecosystems are damaged, the greater the negative effects to the Earth's environment.

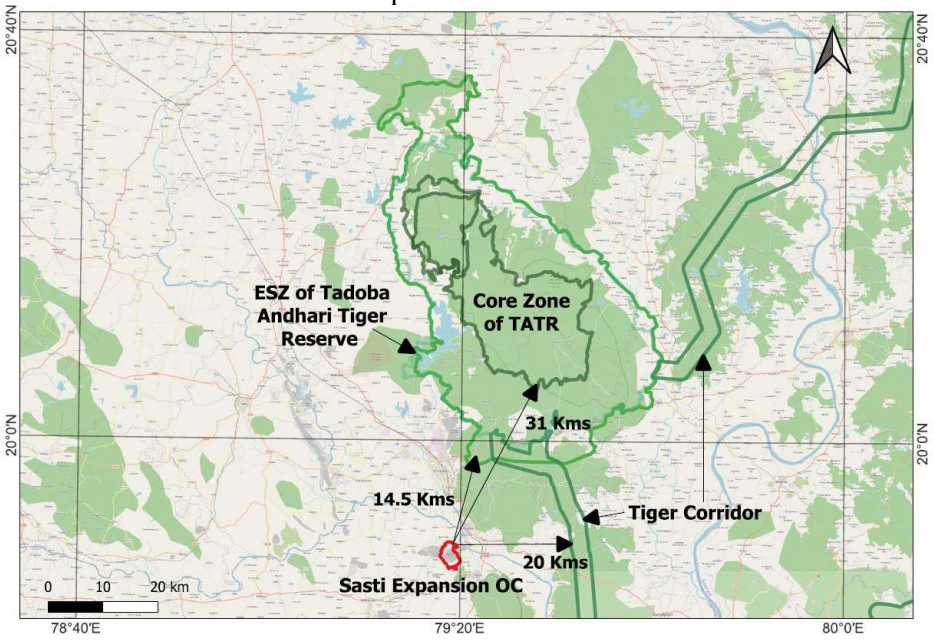
2.1 Description of the study area

The project is located in Chandrapur district of Maharashtra. This is an open-cast mining project. The mine quarry is filled with water and the quarry water gets pumped to township for consumption.

The Plantation on OB dump has *Gliricidia, Dalbergia sissoo, Prosopis juliflora,* Neem, *Acacia mangium* etc. No natural vegetation and no agricultural activity is found in the core zone. Cleaning of the area is in process.

Wild animals come to the area along the wardha River passage, that acts as a natural corridor. Tiger, Leopard, Deer move through the site sometimes. Peacocks are sighted often. There is no remarkable tree flora, only few Tamarind trees, Indian elm etc planted by WCL are present.

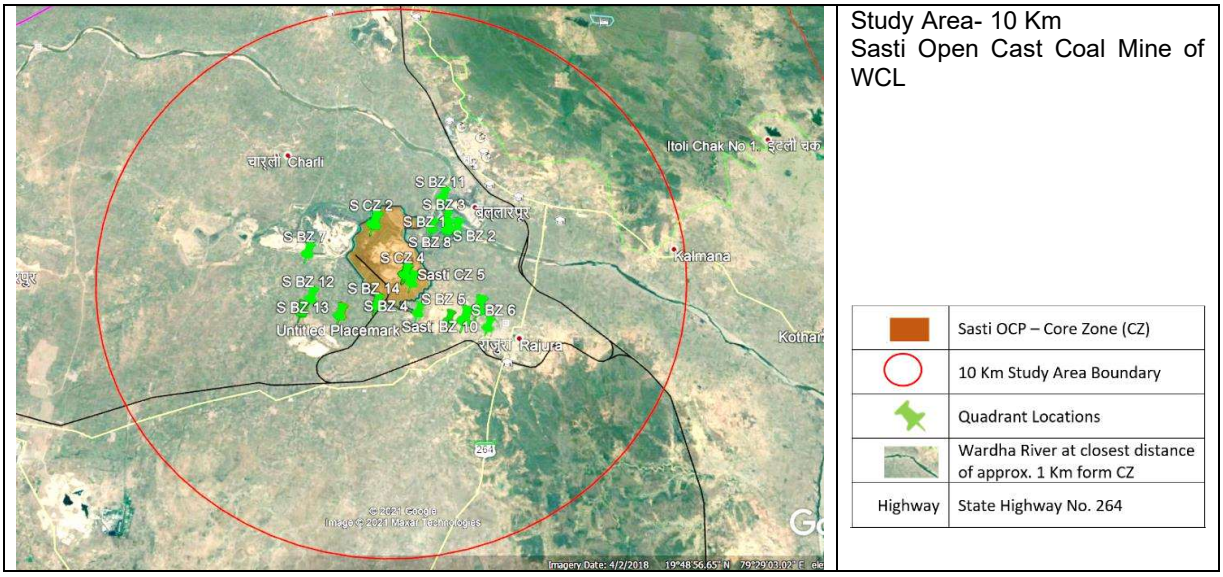
Distance of Sasti Expansion OC from ESZ of TATR



Rajura RF, Junana RF, Ballarshah PF are a part of the study area.

Several mines are in operatation in the vicinity, owing to which, continuous vehicle movements are observed. Wardha River, Erai River, Sarai Nala, Laoni Nala, Sondo Nala, Masbok Nala are some of the water bodies in the study area. Sasti Rd passes through the core and buffer zone. State highway 264, Gadchandur Road, Sasti Rd, Mancherial – Chandrapur- Nagpur Rd. are few roads that pass through the study area.

The nearest railway station is Ballarpur station.



Classification of Forest as per Forest Survey of India:

- Very dense Forest (VDF): All Lands with tree cover (Including mangrove cover) of canopy density of 70% and above
- Mod Dense forest (MDF): All lands with tree cover (Including mangrove cover) of canopy density between 40% and 70% above
- Open forest (OF): All lands with tree cover (Including mangrove cover) of canopy density between 10% and 40%
- Scurb: All forest lands with poor tree growth mainly of small or stunted trees having canopy density less than 10 percent
- Non-Forest: Any area not included in the above classes

Forest Cover of Maharahtra (As per India State of forest Report, 2019)
Maharashtra, the third largest State in the country is ranked second among the States in terms of the recorded forest area. Western Ghats of the State have very rich biodiversity. As per the Champion & Seth Classification of Forest Types (1968), the forests in Maharashtra belong to six Forest Type Groups which are further divided into 17 Forest Types*)*

TABLE 11.16.9 Percentage area under different forest types of in Maharashtra

Sl.No.	Forest Type	% of Forest cover
1	2A/C2 West Coast Semi-Evergreen Forest	11.87
2	3B/C2 Southern Moist Mixed Deciduous Forest	21.01
3	3B/C1b Moist Teak Forest	10.71
4	4B/TS2 Mangrove Forest	0.50
5	4B/TS1 Mangrove Scrub	0.05
6	4A/L1 Littoral Forest	0.01
7	4E/RS1 Riparian Fringing Forest	0.00
8	5A/C3 Southern Dry Mixed Deciduous Forest	26.30
9	5A/C1b Dry Teak Forest	17.40
10	5/DS1 Dry Deciduous Scrub	7.53
11	5/E9 Dry Bamboo Brake	0.46
12	5/E2 *Boswellia* Forest	0.12
13	5/E4 *Hardwickia* Forest	0.11
14	5/E3 Babul Forest	0.03
15	5/E5 *Butea* Forest	0.02
16	6A/C1 Southern Thorn Forest	0.41
17	8A/C2 Western Sub Tropical Hill Forest	1.19
18	Plantation/ TOF	2.28
	Total	**100.00**

From above data, it can be observed that largest percentage of forest type in the state is shared by 5A/C3 Sothern dry mixed deciduous forest (26.30%), 3B/C2 Southern moist mixed deciduous forest (21.01%), followed by 5A/C1b Dry teak forest (17.40%)

Based on the interpretation of IRS Resourcesat-2 LISS III satellite data of the period Oct 2017 to Jan 2018, the Forest Cover in the State is 50,777.56 sq km which is 16.50 % of the State's geographical area. In terms of forest canopy density classes, the State has 8,720.53 sq km under Very Dense Forest(VDF), 20,572.35 sq km under Moderately Dense Forest (MDF) and 21,484.68 sq km under Open Forest (OF).

Forest Area Details of Chandrapur District (in sq km)

Geographical Area	VDF	MDF	OF	Total	% GA	Change wrt 2017 assessment	Scrub
11,441	1,323.03	1,559.44	1,71.99	4,054.46	35.43	-32.54	44.23

2.2 Scope of the study

Study on the existing flora and fauna in the study area (10km) to be carried out and the list of flora and fauna duly authenticated, separately for the core and buffer zone, and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule – I fauna, or if the project falls within 15 km of an ecologically sensitive area, or used as migratory corridor then a comprehensive conservation plan should be prepared

Flora: (Terrestrial / Aquatic)
Agricultural crops, Commercial crops, Plantations, Natural Vegetation / Forest type, Grassland vegetation, Endangered/ Endemic species

Fauna: (Terrestrial / Aquatic)
Total listing of Faunal elements (Mammal, Birds, Reptile, Amphibian, Insects and Butterflies), Endangered species, Endemic species, Migratory species

3. METHODOLOGY OF THE STUDY

Desktop Study: Study of the available information.
It is used to gather contextual information on the site based on existing surveys, literature, database searches and spatial information.

The methodology adopted in this survey complies with those of a reconnaissance survey, providing contextual information obtained from a desktop survey.

3.1 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.
Natural vegetation, invaded species, avenue trees, home garden plants, hedge vegetation of agriculture fields, plants present in the ponds, rivers, hill areas 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, 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. 20 sample plots (including 5 in core and 15 in 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 to be 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.

3.2 Fauna Survey

The survey is carried out during early hours of morning and late hours of evening time. Faunal elements of core and buffer zone were assessed from direct sightings and indirect evidence 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.

3.3 Seasonability of the study

The field survey is carried on 22nd and 23rd March 2021, which represent the summer season.

3.4 Limitations

Complete flora and fauna surveys require multiple surveys, at different times of year, and over a period of years, to enable observation of all species present. Some flora species, such as annuals, are only available for collection at certain times of the year, and others are only identifiable at certain times (such as when they are flowering). Additionally, climatic, and stochastic events (such as fire) may affect the presence of plant species. Species that have a very low abundance in the area are more difficult to locate, due to above factors. Therefore, there is the possibility that some species with low abundance in the area may be overlooked.

The fauna reported are species that can be easily seen, heard or have distinctive signs, such as tracks. Many cryptic and nocturnal species may not have been identified during a survey.

4. BIODIVERSITY STUDY

Biodiversity of flora in the study area were carried out using quadrat sampling method.

Table 1: Summary of Vegetative Survey

Zone	Quadrant	Common Name	Scientific Name	Num of Trees	Girth at Breast Height (cm2)	Height (m)	Longitude, Latitude
Core	Q1 Near existing Mine	Hingot	*Balanites aegyptiaca* (L.) Del.	1	40	6	19°48'0.6"N, 79°19'19.1"E
	Q2 WCL Plantation	Neem	*Azadirachta indica* A.juss	2	100, 110	12	19°49'9.70"N, 79°18'24.73"E
		Siamese Cassia	*Cassia siamea* Lam.	1	70	12	
	Q3 Near old Mine	Polash	*Butea monosperma* (Lam.) Taub.	1	70	7	19°48'0.04"N, 79°19'15.72"E
		Jangli sargua	*Moringa concanensis* Nimmo,	1	80	7	
		Mesquite	*Prosopis juliflora* (Sw.) DC	3	20,50	3-4	
	Q4 Near agricultural land	Ber	*Ziziphus mauritiana* Lam.	1	60	5	19°47'59"N, 79°19'17"E
	Q5 Farm Land area	Polash	*Butea monosperma* (Lam.) Taub.	1	120	7	19°4748.07"N 79°19'27.49"E
		Jangli jilebe	*Pithecellobium dulce* (Roxb.) Benth.	1	20	3	
Buffer	Q1 Near old mine	Hairy Fig	*Ficus hispida* L. F.	2	40, 80	4-5	19°49'11.86"N , 79°20'29.73"E
	Q2 Old pine dump plantation	Mesquite	*Prosopis juliflora* (Sw.) DC.	6	80, 100	8-9	19°49'10.82"N , 79°20'15.24"E
	Q3 Near site office	False asoca	*Monoon longifolium* Sonn. B.Xue & R.M.K.Saunders	1	40	6	19°49'27.41"N , 79°20'13.32"E
		Beach almond	*Terminalia catappa* L.	2	80, 90	8 to 9	
	Q4 Roadside Trees	Tamarind	*Tamarindus indica* L.	2	300, 350	13 to 16	19°47'5.40"N, 79°19'40.18"E
	Q5 Edges of farm land	Palm tree	*Borassus flabellifer* L.	3	230, 250	20-24	19°47'11.84"N , 79°21'6.20"E
	Q6 Forest Area	Banyan tree	*Ficus bengalensis* L.	1	260	19	19°46'54.53"N , 79°20'46.59"E
	Q7- Near nala	Kaim	*Mitragyna parvifolia* (Roxb.) Korth.	1	150	9	19°48'21.63", 79°20'15.31"E
	Q8(Farm Land)	-					
	Q9 Forest Area	Tendu	*Diospyros melanoxylon* Roxb.	1	210	12	19°46'57.11"N , 79°20'25.02"E
	Q10 Town Area	Sirish	*Albizia lebbeck* (L.) Willd.	1	240	15	19°46'51.01"N , 79°21'21.92"E
	Q11 Near old Mine	Mesquite	*Prosopis juliflora* (Sw.) DC	2	30, 60	4 -9	19°49'59.84"N , 79°20'6.25"E
		Sagwan	*Tectona grandis* L.	2	30, 50	6 -7	
	Q12 Farm Land	Jangli sargua	*Moringa concanensis* Nimmo,	1	140	9	19°47'15.64"N , 79°17'1.5"E
		Ber	*Ziziphus mauritiana* Lam.	1	20	3	
	Q13 Farm Land	Jangli sargua	*Azadirachta indica* A. Juss.	1	100	8	19°46'54.51"N 79°17'48.21"E
		Subabul	*Leucaena leucocephala* (Lam.) De Wit	12	20, 30	10	
	Q14 Farm Land	Babul	*Acacia nilotica* (L.) Del.ssp. Indica (Benth.) Brenan	1	90	11	19°47'11.48"N 79°18'38"E
		Green ebony persimmon	*Diospyros chloroxylon* Roxb.	1	70	4	
		Ber	*Ziziphus mauritiana* Lam.	1	60	5	
	Q15 Village road side	Safed babul	*Acacia leucophloea* (Roxb.) Willd.	1	90	12	19°46'54.80"N 79°16'50.03"E
		Axle wood	*Anogeissus acuminata* (Roxb. Ex DC.) Guill. & Perr.	1	160	16	

Zone	Quadrant	Common Name	Scientific Name	Num of Trees	Girth at Breast Height (cm2)	Height (m)	Longitude, Latitude
		Neem	*Azadirachta indica* A. Juss.	2	20	4	

4.1. 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.

A community dominated by one or two species is less diverse than one in which several different species have a similar abundance.

Simpson's Diversity Index is a measure of diversity which considers 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 on basis of the survey is given below in Table

Table 2: Biodiversity Index of Core Zone

Quadrant	Scientific Name	Num of Trees	Simpsons index of biodiversity	% Simpsons index of biodiversity
Q1	*Balanites aegyptiaca* (L.) Del.	1	0	0
Q2	*Azadirachta indica* A.juss	2	0.44	44.45
	Cassia siamea Lam.	1		
Q3	*Butea monosperma* (Lam.) Taub.	1	0.56	56
	Moringa concanensis Nimmo,	1		
	Prosopis juliflora (Sw.) DC	3		
Q4	*Ziziphus mauritiana* Lam.	1	0	0
Q5	*Butea monosperma* (Lam.) Taub.	1	0.5	50
	Pithecellobium dulce (Roxb.) Benth.	1		

In core zone, the biodiversity of various quadrants ranges between 0 and 0.56. Though variety of species are observed across quadrants, biodiversity in each quadrant is very less.

Table 3: Biodiversity Index of Buffer Zone

Quadrant	Scientific Name	Num of Trees	Simpsons index of biodiversity	% Simpsons index of biodiversity
Q1	*Ficus hispida* L. F.	2	0	0
Q2	*Prosopis juliflora* (Sw.) DC.	6	0	0
Q3	*Monoon longifolium* Sonn. B.Xue & R.M.K.Saunders	1	0.44	44.45
	Terminalia catappa L.	2		
Q4	*Tamarindus indica* L.	2	0	0
Q5	*Borassus flabellifer* L.	3	0	0
Q6	*Ficus bengalensis* L.	1	0	0
Q7	*Mitragyna parvifolia* (Roxb.) Korth.	1	0	0
Q8				
Q9	*Diospyros melanoxylon* Roxb.	1	0	0
Q10	*Albizia lebbeck* (L.) Willd.	1	0	0

Quadrant	Scientific Name	Num of Trees	Simpsons index of biodiversity	% Simpsons index of biodiversity
Q11	*Prosopis juliflora* (Sw.) DC	2	0.5	50
	Tectona grandis L.	2		
Q12	*Moringa concanensis* Nimmo,	1	0.5	50
	Ziziphus mauritiana Lam.	1		
Q13	*Azadirachta indica* A. juss.	1	0.14	14.2
	Leucaena leucocephala (Lam.) de Wit .	12		
Q14	*Acacia nilotica* (L.) Del.ssp. indica (Benth.) Brenan	1	0.66	66.67
	Diospyros chloroxylon Roxb.	1		
	Ziziphus mauritiana Lam.	1		
Q15	*Acacia leucophloea* (Roxb.) Willd.	1	0.62	62.5
	Anogeissus acuminata (Roxb. Ex DC.) Guill. & Perr.	1		
	Azadirachta indica A. Juss.	2		

In buffer zone, the biodiversity of various quadrants ranges between 0 and 0.66. Though variety of species are observed across quadrants, biodiversity in each quadrant is very less.

4.2. Importance Value Index (IVI)

Relative density (RD) is the number of a given species expressed as a percentage of all species present, Relative Frequency (RF) is the frequency of a given species expressed as a percentage of the sum of frequency values for all species present, and Relative Dominance (RDo) is the basal area of given species expressed as a percentage of the total basal area of all species present. These three measures are summed to give the importance value, which may lie between 0 and 300.

Table 4: Importance Value Index of Core Zone

Species	No. Of trees	Basal Area	Frequency (A)	RF	RD	RDo	IVI
Azadirachta indica A.juss	2	1755.57	40	11.76	16.67	36.34	64.77
Balanites aegyptiaca (L.) Del.	1	127.38	40	11.76	8.33	2.64	22.74
Butea monosperma (Lam.) Taub.	2	1437.10	60	17.65	16.67	29.75	64.06
Cassia siamea Lam.	1	390.12	40	11.76	8.33	8.08	28.17
Moringa concanensis Nimmo,	1	509.55	40	11.76	8.33	10.55	30.65
Pithecellobium dulce (Roxb.) Benth.	1	31.84	40	11.76	8.33	0.66	20.76
Prosopis juliflora (Sw.) DC	3	292.59	40	11.76	25	6.06	42.82
Ziziphus mauritiana Lam.	1	286.62	40	11.76	8.33	5.93	26.03

Azadirachta indica A.juss tree has higher IVI in core (64.77) followed by *Butea monosperma* (64.06).

Table 5: Importance Value Index of Buffer Zone

Species	No. Of trees	Basal Area	Frequency (A)	RF	RD	Rdo	IVI
Acacia leucophloea (Roxb.) Willd.	1	644.90	6.67	4.55	2.17	1.11	7.83
Acacia nilotica (L.) Del.ssp. indica (Benth.) Brenan	1	644.90	6.67	4.55	2.17	1.11	7.83
Albizia lebbeck (L.) Willd.	1	4585.99	6.67	4.55	2.17	7.93	14.65
Anogeissus acuminata (Roxb. Ex DC.) Guill. & Perr.	1	2038.22	6.67	4.55	2.17	3.52	10.24
Azadirachta indica A. juss.	3	859.87	13.33	9.09	6.52	1.49	17.10
Borassus flabellifer L.	3	13757.96	6.67	4.55	6.52	23.78	34.85
Diospyros melanoxylon Roxb.	1	3511.15	6.67	4.55	2.17	6.07	12.79
Diospyros chloroxylon Roxb.	1	390.13	6.67	4.55	2.17	0.67	7.39
Ficus bengalensis L.	1	5382.17	6.67	4.55	2.17	9.30	16.02
Ficus hispida L. F.	2	573.25	6.67	4.55	4.35	0.99	9.88

Leucaena leucocephala (Lam.) de Wit .12	12	597.13	6.67	4.55	26.09	1.03	31.66
Mitragyna parvifolia (Roxb.) Korth.	1	1791.40	6.67	4.55	2.17	3.10	9.82
Monoon longifolium Sonn. B.Xue & R.M.K.Saunders	1	127.39	6.67	4.55	2.17	0.22	6.94
Moringa concanensis Nimmo,	1	1560.51	6.67	4.55	2.17	2.70	9.42
Prosopis juliflora (Sw.) DC.	8	2902.07	13.33	9.09	17.39	5.02	31.50
Tamarindus indica L.	2	16819.27	6.67	4.55	4.35	29.08	37.97
Tectona grandis L.	2	254.78	6.67	4.55	4.35	0.44	9.33
Terminalia catappa L.	2	1150.48	6.67	4.55	4.35	1.99	10.88
Ziziphus mauritiana Lam.	2	254.78	13.33	9.09	4.35	0.44	13.88

Tamarindus indica (37.97) has highest IVI in buffer zone followed by *Borassus flabellifer* L.(34.85)

5. BASELINE STATUS OF FLORA

Flora of the project areas is classified in to Terrestrial and Aquatic flora.

5.1. 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 among 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. No agricultural activity takes place in the core zone. List of vegetables grown in buffer zone are given below

Table 6: List of Vegetables in the Buffer Zone

Common name	Local name	Botanical name	Name of class/Family
Lady's finger	Okra	*Abelmoschus esculentus* (L.) Moench	*Malvaceae*
Onion	Pyag	Allium cepa	*Alliaceae*
Mustard	Sarson	*Brassica juncea* L	*Brassicaceae*
Cabbage	patta gobhee	*Brassica oleracea*	*Brassicaceae*
Cauliflower	Gobi	*Brassica oleracea var. botrytis*	*Brassicaceae*
German turnip	Kohlrabi	*Brassica oleracea var. gongylodes*	*Brassicaceae*
Chilly	Lalmirchi	*Capsicum annum* L.	*Solanaceae*
Pumpkin	Kaddoo	*Cucurbita maxima* Duch ex Lam.	*Cucurbitaceae*
Fennel	Suanf	*Foeniculum vulgare* Mill.	*Apiaceae*
Bottle guard	Laukee	*Lagenaria siceraria* (Molina) Standl	*Cucurbitaceae*
Spong gourd	Spanjlaukee	*Luffa cylindrica* (L.) M. Roem.	*Cucurbitaceae*
Tomato	Tamatar	*Lycopersicum esculentum* L	*Solanaceae*
Radish	Moolee	*Rhapanus sativus* L. var capitata	*Brassicaceae*
Brinjal	Baingan	*Solanum melongena* L.	*Solanaceae*

Source: Field survey, discussion with locals

(ii) Commercial Crops:

Commercial crop or profit crop is an agricultural crop which is grown to sell for profit. It is typically purchased by parties separate from a farm. The term is used to differentiate marketed crops from subsistence crops, which are those fed to the producer's own livestock or grown as food for the producer's family. Commercial crops are not cultivated in the core zone. List of commercial crops grownin buffer zone is given in Table below.

Table 7: List of Commercial Crops in Buffer Zone

Common name	Local name	Botanical name	Name of class/Family
Field mustard	Rai	*Brassica campestris* L.	Brassicaceae
Chick pea	Chana	*Cicer arietinum* L.	Leguminosae
Lemon	Nimbu	*Citrus limon* (L.) Burm. F.	Rutaceae
Mandarin orange	Chandra	*Citrus reticulata Blanco*	Rutaceae
Soyabean	Soya	*Glycine max* (L.) Merr.	Leguminosae
Upland cotton	Kapok	*Gossypium hirsutum* L.	Malvaceae
Green gram	Moong	*Phaseolus mungo* L.	Leguminosae
Pea	Matar	*Pisum sativum* L.	Leguminosae
Wheat	Gehun	*Triticum aestivum* L.	Poaceae
Maize	Makki	*Zea mays* L.	Poaceae
Kans grass		*Saccharum spontaneum* L.	Poaceae

Source: Field survey, Interaction with locals

(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 8: Status of Natural Vegetation/Shrub/Climber species in Study Area

Scientific Name	Abundance		Average		Minimum		IUCN Status
	Core	Buffer	Core	Buffer	Core	Buffer	
Acacia leucophloea (Roxb.) Willd.		1		1		1	LC
Acacia nilotica (L.) Del.ssp. indica (Benth.) Brenan		1		1		1	LC
Albizia lebbeck (L.) Willd.		1		1		1	LC
Anogeissus acuminata (Roxb. Ex DC.) Guill. & Perr.		1		1		1	-
Azadirachta indica A. juss.		3		1.5		1	LC
Balanites aegyptiaca (L.) Del.	1		1		1		LC
Borassus flabellifer L.		3		3		3	-
Butea monosperma (Lam.) Taub.	2		1		1		LC
Cassia siamea Lam.	1		1		1		LC
Diospyros melanoxylon Roxb.		1		1		1	-
Diospyros chloroxylon Roxb.		1		1		1	-
Ficus bengalensis L.		1		1		1	-
Ficus hispida L. F.		2		2		2	LC
Leucaena leucocephala (Lam.) de Wit		12		12		12	-
Mitragyna parvifolia (Roxb.) Korth.		1		1		1	-
Monoon longifolium Sonn. B.Xue & R.M.K.Saunders		1		1		1	-
Moringa concanensis Nimmo	1	1	1	1	1	1	-
Pithecellobium dulce (Roxb.) Benth.	1		1		1		LC
Prosopis juliflora (Sw.) DC.	3	6	3	6	3	6	-
Tamarindus indica L.		2		2		2	LC
Tectona grandis L.		2		2		2	-
Terminalia catappa L.		2		2		2	LC
Ziziphus mauritiana Lam.	1	2	1	1	1	1	LC

Table 9: List of Plants in Core Zone

Plant species	Common name	Habitat	Family Average	Abundance	Average	Minimum	IUCN Status
Shrubs/climbers							
Calotropis procera(Ait.) R.Br.	Awk	Wild	NA	1	1	1	-
Calycopteris floribunda Lam.	Ukshi	Wild	NA	2	2	2	-
Cocculus hirsutus (L.) Diels	Broom Creeper	Wild	NA	1	1	1	-
Lantana camera L.	Wild sage	Invaded	NA	6	3	3	-
Herbs							
Abutilon pannosum (G.Forst.) Schltdl	Karandi	Weed	1.6	3	1	1	-
Achyranthes aspera L	Chirchita	Weed	2.5	4	2	2	-
Aerva lanata (L.) Juss.	Chaya	Weed	2.5	2	3	3	-
Alternanthera ficoidea (L.) P. Beauv.	Smoothy joy weed	Invaded	2.5	4	4	4	-
Hibiscus panduriformis Burm.f	Wild bhindi	Wild	1.6	2	2	2	-
Grass/crop							
Apluda mutica L.	Bhongta	Wild	3.22	3	3	3	-
Cyanodon dactylon L.	Durva	Wild	3.22	9	3	3	-
Cymbopogon nardus (L.) Rendle	Wild lemon grass	Wild	3.22	4	4	4	-
Digitaria sanguinalis (L.) Scop.	Crab grass	Wild	3.22	4	2	2	LC
Heteropogon contortus (L.) P.Beauv.	Spear grass	Wild	3.22	9	4.5	4	-

Table 10: List of Plants in Buffer Zone

Plant species	Common name	Habitat	Family Average	Abundance	Avg	Min	IUCN Status
Shrubs/climbers							
Cassytha filiformis L.	Akasha valli	Parasite	NA	1	1	1	
Cocculus hirsutus (L.) Diels	Broom Creeper	Wild climber	1.5	2	2	2	
Lantana camera L.	Wild sage	Invaded	NA	14	2.8	2	
Phyllanthus reticulatus Poir.	Kambojini	Wild in hedges	NA	1	1	1	LC
Tinospora cordifolia (Willd.) Miers ex Hook. F. & Thoms.	Geloy	Wild	1.5	1	1	1	
Herbs							
Abutilon pannosum (Forst. F.) Schlect	Atibala	Weed	3.71	4	4	4	-
Anisomeles indica (L.) Kuntze	Indian Catmint	Weed	2	1	1	1	-
Barleria prionitis L.	Vajradanti	Wild	7	5	5	5	LC
Blumea paniculata (Willd.) M.R.Almeida	Mharbir	Weed	4.33	5	5	5	-
Hygrophila auriculata (Schumach.) Heine	Kokilaksha	Weed	7	4	4	4	LC
Hyptis suaveolens (L.) Poit.	Bushmint	Invaded	2	3	3	3	-
Malachra capitata (L.) L.	Brazil Jute	Invaded	4.5	4	4	4	-
Neptunia oleracea Lour.	Water mimosa	Wild	2.5	1	1	1	-
Parthenium hysterophorus L.	Congress weed	Invaded	4.33	6	6	6	LC
Polygonum plebeium R.Br	Chimati saag	Weed	3	2	2	2	LC
Senna tora L.	Panward	Invaded	2.5	4	4	4	-
Sida acuta L.	Wire weed	Weed	3.71	5	5	5	-
Sida cordata L.	Long stalked sida	Weed	3.71	11	3.66	3	-
Strobilanthes urens (B.Heyne ex Roth) J.R.I.Wood		Wild	7	10	10	10	-
Trichodesma zeylanicum (Burm.f.) R.Br.	Camel Bush	Weed	NA	2	2	2	-
Tridax procumbens L.	Kanphuli	Weed	4.33	2	2	2	-

Triumfetta rotundifolia Lam.		Weed	3.71	2	2	2	-
Grass/crop							
Cyanodon dactylon L.	Durva	Weed	4.5	3	3	3	-
Digitaria sanguinalis (L.) Scop.		Weed	4.5	2	2	2	LC
Sorghum bicolor (L.) Moench	Jowar	Crop	4.5	6	6	6	LC
Triticum aestivum L.	Wheat	Crop	4.5	7	7	7	-

(Abbreviations: LC-Least Concern, Avg.-Average, Min.- Minimum)

5.2. Aquatic Flora

Aquatic Flora are plants that have adapted to living in aquatic environments. They are also referred to as hydrophytes or macrophytes to distinguish them from algae and other microphytes. A macrophyte is a plant that grows in or near water and is either emergent, submergent, or floating. There were few seasonal drains and village ponds found in the core zone, which had a few floral species. List of Aquatic Flora found in buffer zone is given in Tables below

Table 11: List of Aquatic flora in the Core zone

Common name	Local name	Botanical name	Name of class/Family	IUCN Status
Water taro	Kesave	*Colocasia esculenta* (L.) Schott	*Araceae*	LC
Nut sedge	Bara-nagar-motha	*Cyperus corymbosus* Rottb.	*Cyperaceae*	LC
Rice flat sedge	Moth	*Cyperus iria* L.	*Cyperaceae*	LC
Floating heart	Nali	*Ipomoea aquatica* Forssk.	*Convolvulaceae*	LC
Four leaved clover	Chopatiya	*Marsilea quadrifolia* L.	*Marsiliaceae*	LC
Water lily	Neelkamal	*Nymphaea nouchali* Burm f	*Nymphaeaceae*	LC
Water snowflake	Kumudini.	*Nymphoides indica* (L.) Kuntze.	*Menyanhaceae*	LC
Torpedograss	Nali,	*Panicum repens* L.	*Poaceae*	LC
Common marsh buckwheat.	Sheral	*Persicaria glabra* (Willd.) M.Gómez	*Polygonaceae*	LC
Carpet weed	Jala pippali	*Phyla nodiflora* (L.) Grene	*Verbenaceae*	LC
Marsh buckwheat		*Pycreus pumilus* (L.) Nees	*Cyperaceae*	LC
Athel tree	Lal jhau	*Tamarix aphylla* (L.) Karst.	*Tamaricaceae*	LC
Common cattail	Pata	*Typha angustifolia L.*	*Typhaceae*	LC
Tape grass	Syala	*Vallisneria australis* S.W.L.Jacobs & Les	*Hydorcharitaceae*	-

Source: Field survey, discussion with locals.

Table 12: List of Aquatic flora in the Buffer zone

Common name	Local name	Botanical name	Name of class/Family	IUCN Status
Water taro	Kesave	*Colocasia esculenta* (L.) Schott	*Araceae*	LC
Nut sedge	Bara-nagar-motha	*Cyperus corymbosus* Rottb.	*Cyperaceae*	LC
Rice flat sedge	Moth	*Cyperus iria* L.	*Cyperaceae*	LC
Floating heart	Nali	*Ipomoea aquatica* Forssk.	*Convolvulaceae*	LC
Four leaved clover	Chopatiya	*Marsilea quadrifolia* L.	*Marsiliaceae*	LC
Water lily	Neelkamal	*Nymphaea nouchali* Burm f	*Nymphaeaceae*	LC
Water snowflake	Kumudini.	*Nymphoides indica* (L.) Kuntze.	*Menyanhaceae*	LC
Torpedograss	Nali,	*Panicum repens* L.	*Poaceae*	LC
Common marsh buckwheat.	Sheral	*Persicaria glabra* (Willd.) M.Gómez	*Polygonaceae*	LC
Carpet weed	Jala pippali	*Phyla nodiflora* (L.) Grene	*Verbenaceae*	LC
Marsh buckwheat		*Pycreus pumilus* (L.) Nees	*Cyperaceae*	LC
Athel tree	Lal jhau	*Tamarix aphylla* (L.) Karst.	*Tamaricaceae*	LC
Common cattail	Pata	*Typha angustifolia L.*	*Typhaceae*	LC
Tape grass	Syala	*Vallisneria australis* S.W.L.Jacobs & Les	*Hydorcharitaceae*	-

Source: Field survey, discussion with locals.

5.3. 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 species recommended for green belt development are presented below.

Table 13: List of Plants recommended for green belt development/ land reclamation

Species	Common Name
Acacia leucophloea (Roxb.) Willd	White babul
Acacia nilotica (L.) Willd ex Delile	Babul
Aegle marmelos (L.) Corrêa	Bael
Ailanthus excelsa Roxb	Maharuk
*Albizia procera (*Roxb.) Benth.	Safed sirish
Albizia odoratissima (L.f.) Benth.	Kala sirish
Albizia lebbeck (L.) Benth	Sirish
Alstonia scholoris (L.) R.Br	Chitvan
Anogeissus acuminata (Roxb. Ex DC.) Wall.	Buttontree
Anogeissus latifolia (Roxb. Ex DC.) Wall. Ex Guillem. & Perr.	Daura
Artocarpus heterophyllus Lam.	Kathal
Azadirachta indica A. Juss.	Neem
Bombax ceiba L.	Salmali
Bridelia retusa (L.) A.Juss.	Spinous kino
Buchanania cochinchinensis (Lour.) M.R.Almeida	Chhar
Butea monosperma (Lam.) Taub.	Polash
Chloroxylon swietenia DC.	Behru
Crateva religiosa G.Forst.	Varun
Dalbergia lanceolaria L.f.	Panshi
Euphorbia nivulea Buch-Ham	Common milk hedge
Ficus arnottiana (Miq)Miq	Pimpri
Ficus benghalensis L.	Bargad
Ficus racemosa L.	Fig
Ficus religiosa L.	Ashwatha
Firmiana simplex (L.) W.Wight	Gullu
Gardenia gummifera L.f.	Dikamalle
Haldina cordifolia (Roxb.) Ridsdale	Haldu
Holoptelia integrifoila (Roxb.) Planch	Chilbil
Lagerstroemia parviflora Roxb.	Lendia
Lagerstroemia speciosa (L.) Pers.	Pride of India
Lannea coromandeliana (Houtt.) Merr	Mohin
Leucaena leucocephala (Lam.) De Wit	Subabul
Madhuca longifolia var. *Latifolia* (Roxb.) A.Chev.	Mahua
Mangifera indica L.	Mango
Manilkara hexandra (Roxb.) Dubard	Khirni
Mimusops elengi L.	Bakul
Mitragyna parvifolia (Roxb.) Korth.	Kaim
Neolamarckia cadamba (Roxb.) Bosser	Kadamb
Phoenix sylvestris (L.) Roxb.	Date
Phyllanthus emblica L.	Amla
Pithecellobium dulce (Roxb.) Benth.	Jangli jilebe
Plumiera rubra L.	Golachin

Species	Common Name
Putranjiva roxburghii Wall.	Putrajivi
Schleichera oleosa (Lour.) Oken.	Kusum
Schrebera swietenioides Roxb.	Banpalas
Semecarpus anacardium L.f	Bilawa
Shorea robusta Gaertn f	Sal
Soymida febrifuga (Roxb.) Juss.	Rohin
Streblus asper Lour.	Sihora
Syzygium cumini (L.) Skeels	Jamun
Tamarindus indica L	Tamarind
Tectona grandis L.	Sagwan
Terminalia alata Wall.	Saj
Terminalia arjuna (Roxb.) Wt &Arn.	Arjun
Terminalia bellirica (Gaertn.) Roxb.	Baheda
Terminalia chebula. Retz.	Harad
Terminalia elliptica Willd.	Saj
Wrightia tinctoria R.Br.	Kala kuda
Wrightia arborea (Dennst.) Mabb.	Dharauli
Ziziphus mauritiana Lamk.	Ber

6. 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.

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. Wardha River flows at approx. 1 Km. A stream of water flows through the core zone into the buffer zone

6.1. Terrestrial Fauna

Table 14: List of Terrestrial Fauna in in the Core

Name			WPA, 1972 Status	IUCN Status
English	**Common / Hindi**	**Scientific**		
Mammal				
Bandicoot Rat	Chuha	*Bandicota bengalensis*	IV/ V	LC
5 Strip Palm squirrel	Gilahari	*Funambulus pennantii*	IV	LC
Common House Rat	Chuha	*Rattus rattus*	IV/ V	LC
Common Mongoose	Nevlaa	*Herpestes edwardsi*	II	LC
Common Palm Squirrel	Gilhari	*Funambulus palmarum*	-	LC
Birds				
Common Myna	Myna	*Acridotheres tristis*	IV	LC
Crow pheasant	Couckoo	*Centropus sinensis*	IV	LC
Pigeon	Kabutar	*Columbia livia*	-	LC
House Crow	Kauva	*Corvus splendens*	V	LC
Little egret	Kilchia Bagla	*Egretta garzetta*	IV	LC
Koel	Koyal	*Eudynamys scolopacea*	IV	LC
Vented Bulbul	Bulbul	*Pycnonotus cafer*	IV	LC
Asian pied starling	Maina	*Sturnus contra*	IV	-
Yellow legged Green Pigeon	Kabutar	*Treron Phoenicopterus*	IV	LC
Reptile				
Common Krait	Sanmp	*Bungarus caeruleus*	-	-
Garden Lizard	Girgit	*Calotes versicolor*	-	-
Smooth water snake	Sanmp	*Enhydris enhydris*	IV	LC
House Lizard	Chipkali	*Hemidactylus sp.*	-	LC
Cobra	Cobra	*Naja Naja*	II	DD
Rat Snake	Sanmp	*Ptyas mucosus*	II	-
Amphibian				
Common toad	Medhak	*Bufo melanostictus*	-	LC
Common frog	Medhak	*Euphlyctis hexadactylus*	-	LC
Green pond frog	Medhak	*Rana hexadactyla*	IV	-
Indian bull frog	Medhak	*Rana tigrine*	IV	LC
Insects				
Dragon Flies	Vyaadh-Patang	*Anisoptera*	-	-
Moth	Phulpakharu	*Antheria mylita*	-	-
Grasshopper	Tidda	*Bacillus rossii*	-	-
Butteflies				
Common Emigrant	Titli	*Catopsilia pomona (Fabricius)*	-	-
Blue Tiger	Titli	*Tirumala limniace leopardus (Butler)*	-	-

Source: *Field survey, Interaction with locals*

Table 15: List of Terrestrial Fauna in the Buffer Zone

Name			WPA, 1972 Status	IUCN Status
English	**Common / Hindi**	**Scientific**		
Mammal				
Chital	Cheetal	*Axis axis*	III	LC
Bandicoot Rat	Chuha	*Bandicota bengalensis*	V	LC
Nilgai	Rojh	*Boselaphus tragocamelus*	III	LC
Jackal	Gidar	*Canis aureus*	II	LC
Jungle Cat	Jangli Billi	*Felis chaus*	II	LC
Common Palm Squirrel	Gilhari	*Funambulus palmarum*	-	LC
5 Strip Palm squirrel	Gilahari	*Funambulus pennantii*	IV	LC
Common Mongoose	Nevlaa	*Herpestes edwardsi*	II	LC
Hyena	Lakadabagdha	*Hyaena hyaena*	III	NT
Indian Hare	Khargosh	*Lepus nigricollis*	IV	LC
Indian Field Mouse	Chuha	*Mus booduga*	V	LC
Common langur	Langur	*Presbytis entellus*	-	VU
Common House Rat	Chuha	*Rattus rattus*	V	LC
Sambar	Sambar	*Rusa unicolor*	III	VU
Hanuman	Langur	*Semnopithecus dussumieri*	II	LC
Wild boar	Suwar	*Sus scrofa*	III	LC
Indian Fox	Lomri	*Vulpes bengalensis*	II	LC
Birds				
Common Myna	Myna	*Acridotheres tristis*	IV	LC
Common Kingfisher	Chhota kilkila	*Alcedo atthis*	IV	LC
Red Avadavat	Laal munia	*Amandava amandava*	IV	LC
Asian Openbill	Gungla	*Anastomus oscitans*	IV	LC
Crow pheasant	Couckoo	*Centropus sinensis*	IV	LC
Pied Kingfisher	Ramchiraya	*Ceryle rudis*	IV	LC
Black-headed Gull	Dhomra	*Chroicocephalus ridibundus*	-	LC
Pigeon	Kabutar	*Columbia livia*	-	LC
House Crow	Kauva	*Corvus splendens*	V	LC
Capped Pygmy Woodpecker	Kaathphora	*Dendrocopos nanus*	IV	LC
Black Drongo	-	*Dicrurus adsimillis*	IV	LC
Ashy Drongo	Rakhi Kotwal	*Dicrurus leucophaeus*	IV	LC
Little egret	Kilchia Bagla	*Egretta garzetta*	IV	LC
Koel	Koyal	*Eudynamys scolopacea*	IV	LC
Painted partirideg	Kala teetar	*Francolinus pictus*	IV	LC
Small Pratincole	Choti Titihari	*Glareola lacteal*		LC
Jungle Owlet	Ullu	*Glaucidium radiatum*	IV	LC
Green bee eater	Patringa	*Merops orientalis*		LC
Heron	Waak	*Nycticorax nycticorax*	IV	LC
Common Tailorbird	Darzee	*Orthotomus sutorius*	IV	LC
House sparrow	Gauriyya	*Passer domesticus*		LC
Jungle Bush Quail	Lovva	*Perdicula asiatica*	IV	LC
Plum headed Parakeet	Tota	*Psittacula cyanocephala*	IV	LC
Rose ringed Parakeet	Lybar tota	*Psittacula krameria*	IV	LC
Vented Bulbul	Bulbul	*Pycnonotus cafer*	IV	LC
Whiskered Bulbul	Bulbul	*Pycnonotus jocosus*	IV	LC
Indian Robin	Diyal	*Saxicoloides fulicatus*	-	LC

Name			WPA, 1972 Status	IUCN Status
English	**Common / Hindi**	**Scientific**		
Spotted Dove	Kabutar	*Streptopelia chinensis*	IV	-
Asian pied starling	Maina	*Sturnus contra*	IV	-
Yellow legged Green Pigeon	Kabutar	*Treron Phoenicopterus*	IV	LC
Common Babbler	Gaigai	*Turdoides caudatus*	-	LC
Wattled lapwing	Titeeri	*Vanellus indicus*	-	LC
		Reptile		
Common Krait	Sanmp	*Bungarus caeruleus*	-	-
Garden Lizard	Girgit	*Calotes versicolor*	-	-
Smooth Water Snake	Sanmp	*Enhydris enhydris*	-	LC
House Lizard	Chipkali	*Hemidactylus sp.*	-	LC
Cobra	Cobra	*Naja Naja*	II	DD
Common Water Snake	Sanmp	*Natrix piscator*	-	-
Rat Snake	Sanmp	*Ptyas mucosus*	II	-
Russel's Viper	Sanmp	*Vipera russeli*	II	LC
		Amphibian		
Common Toad	Medhak	*Bufo melanostictus*	-	LC
Common Frog	Medhak	*Euphlyctis hexadactylus*	IV	LC
Green Pond Frog	Medhak	*Rana hexadactyla*	-	-
Indian Bull Frog	Medhak	*Rana tigrine*	IV	LC
		Insects		
Dragon Flies	Vyaadh-Patang	*Anisoptera*	-	-
Moth	Phulpakharu	*Antheria mylita*	-	-
Grasshopper	Tidda	*Bacillus rossii*	-	-
		Butterflies		
Common Emigrant	Titli	*Catopsilia pomona (Fabricius)*	-	-
Blue Tiger	Titli	*Tirumala limniace leopardus (Butler)*	-	-
Tailed Jay	Titli	*Graphium agammenon Linn.*	-	-
Spot Swordtail	Titli	*Pathysa nomius nomius (Esper)*	-	-
Lemon or Common Emigrant erias	Titli	*Catopsilia pomona* (Fabricius)	-	-
Common grass yellow	Titli	*Hecabe simulata (Moore)*	-	-

Source: Working Plan- Chandrapur Forest Department, Field survey and Interaction with forest department officials and locals

Table 16: List of Schedule I/ Endangered species

Name			WPA, 1972 Status	IUCN Status
Scientific	**English**	**Common / Hindi**		
		Mammal		
Cuon alpinus	Wild dog	Jungli kutta	II	EN
Melursus ursinus	Sloth bear	Bhalu	I	VU
Panthera Pardus	Leopard	Tendua	I	VU
Panthera tigris	Tiger	Wagh	I	EN
		Bird		
Pavo cristatus	Indian peafowl	Morr	I	LC

Source: field suvery, working plan- Chandrapur forest division, discussion with forest officials

Table 17: List of Migratory Birds

Scientific name	Common Name	Local Name	Schedule Status (WPA 1972)	IUCN Status
Anas acuta	Northern Pintail	Seenkh par Battak	IV	LC
Anas Penelope	Eurasian Wigeon	Peasan	IV	LC
Ardeola grayii	Indian Pond Heron	Dhokri	IV	LC
Bubulcus ibis	Cattle Egret	Badami Bagla	IV	LC

Source: field stuvery, working plan- Chandrapur forest division, interaction with forest department,
Source of migratory status -bnhsenvis.nic.in

6.2. Aquatic Fauna

An aquatic animal is an animal, either vertebrate or invertebrate, which lives in the water for most or all of its lifetime. Many insects such as mosquitoes, mayflies, dragonflies, and caddis flies have aquatic larvae, with winged adults. List of aquatic fauna identified in buffer zone is given in table below.

Table 18: List of Aquatic Fauna in the Core Zone

Species Name			ICUN Status
English	Common / Hindi	Scientific	
Catla	Murrai	*Catla catla*	-
Kuria labeo	Khursa	*Labeo gonius*	LC
White carp	Mrigal	*Cirrhinus mrigala*	LC
Spotted murrel	Maggri	*Channa punctatus*	LC
Magur	Boyi	*Clarias batrachus*	LC
Rohu	Rohu	*Labeo rohita*	LC

Source: Field survey, Interaction with locals

Table 19: List of Aquatic Fauna in the Buffer Zone

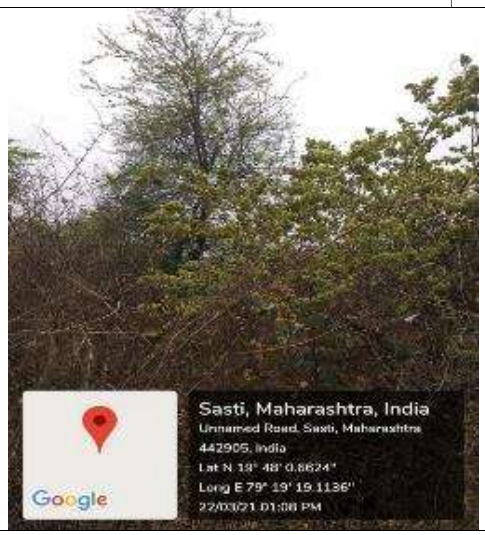
Species Name			ICUN Status
English	Common / Hindi	Scientific	
Catla	Murrai	*Catla catla*	-
Karnataka labeo	Dhai	*Labeo calbasu*	LC
Kuria labeo	Khursa	*Labeo gonius*	LC
Ticto Barb	Kaoli	*Pethia ticto*	LC
White carp	Mrigal	*Cirrhinus mrigala*	LC
Spotted murrel	Maggri	*Channa punctatus*	LC
Magur	Boyi	*Clarias batrachus*	LC
Rohu	Rohu	*Labeo rohita*	LC

Source: Field survey, Interaction with locals

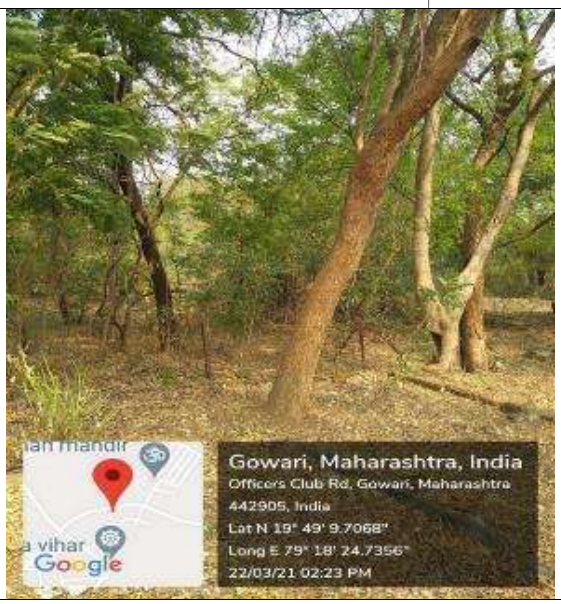
Schedule I : Lists -Rare & Endangered species totally protected
Schedule II : Lists species which deserves more stringent protection
Schedule III & IV: Deserves protection to conserve population
Schedule V : Under Vermin category
EN: Endangered
VU: Vulnerable
LC : Least Concern
DD: Data Deficient

Photographs of Flora and Fauna Study in Core and Buffer Zone

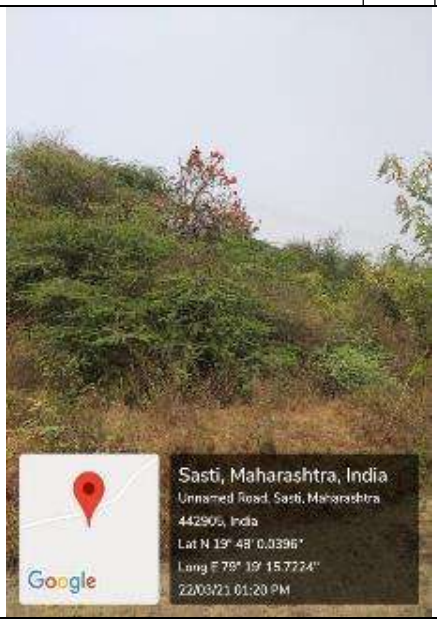
CZ 1 (19°48’ 0.6" N, 79° 19’19.1” E) Near existing mine				
Species		Nos	Stem Circumference (cm)	Height (m)
Common Name	Scientific Name			
Trees				
Hingot	*Balanites aegyptiaca* (L.) Del.	1	40	6
Shrubs				
Broom Creeper	*Cocculus hirsutus* (L.) Diels	1		3
Ukshi	*Calycopteris floribunda* Lam.	2		5
Wild sage	*Lantana camera* L.	2		2
Herbs				
Smoothy joy weed	*Alternanthera ficoidea* (L.) P. Beauv.	4		
Grass				
Bhongta	*Apluda mutica* L.	3		



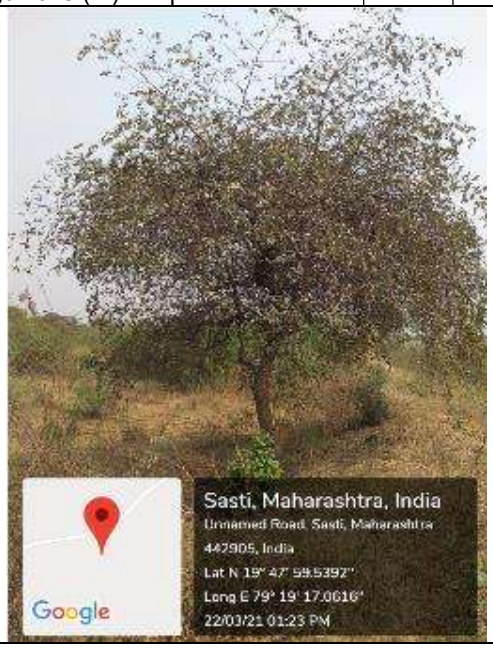
Core Zone 2 (19°49’ 9.70" N, 79° 18’24.73” E) WCL plantation.				
Species		Nos.	Stem Circumference (cm)	Height (m)
Common Name	Scientific Name			
Trees				
Neem	*Azadirachta indica* A.juss	2	100, 110	12
Siamese Cassia	*Cassia siamea* Lam.	1	70	12
Shrub				
Awk	*Calotropis procera* (Ait.) R.Br.	1		1
Wild sage	*Lantana camera* L.	4		2



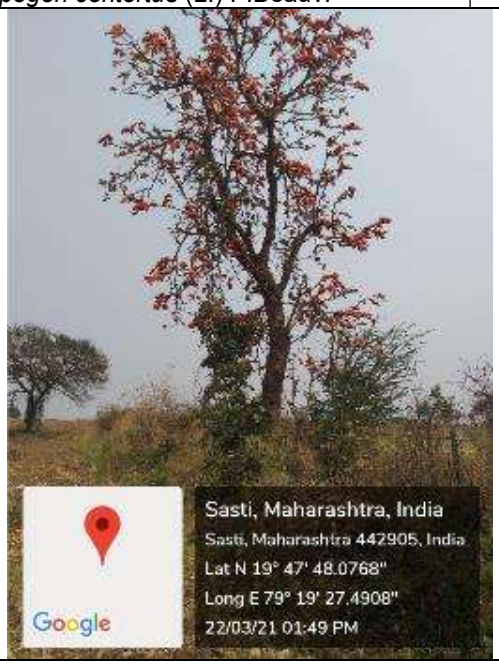
CZ 3 (19°48'0.04"N, 79°19'15.72"E) Near old mine				
Species		Nos	Stem circumference (DBH in cm)	Height (m)
Common name	Scientific name			
Trees				
Polash	*Butea monosperma* (Lam.) Taub.	1	70	7
Jangli sargua	*Moringa concanensis* Nimmo,	1	80	7
Mesquite	*Prosopis juliflora* (Sw.) DC	3	20, 50	3-4
Herb				
Karandi	*Abutilon pannosum* (G.Forst.) Schltdl	1		
Chirchita	*Achyranthes aspera* L	2		
Grasses				
Durva	*Cyanodon dactylon* L.	3		
	Digitaria sanguinalis (L.) Scop.	2		
Spear grass	*Heteropogon contortus* (L.) P.Beauv.	4		



CZ 4 19°47'59"N, 79°19'17"E Near agriculture land				
Species		Nos	Stem circumference (DBH in cm)	Height (m)
Common name	Scientific name			
Trees				
Ber	*Ziziphus mauritiana* Lam.	1	60	5
Herb				
Karandi	*Abutilon pannosum* (G.Forst.) Schltdl	1		
Chaya	*Aerva lanata* (L.) Juss.	2		
Grasses				
Durva	*Cyanodon dactylon* L.	3		
	Digitaria sanguinalis (L.) Scop.	2		

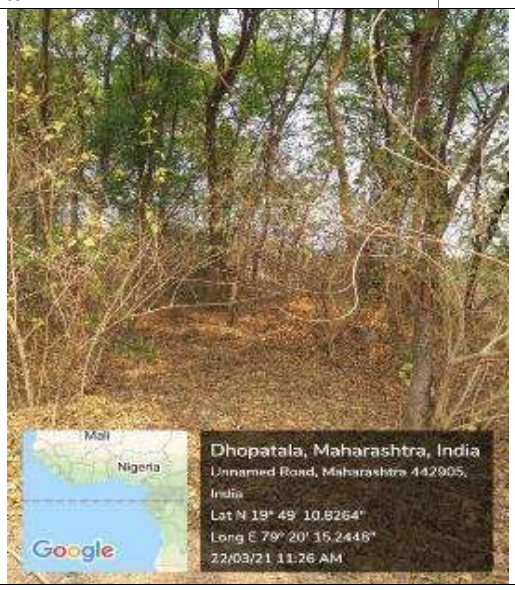


CZ 5 (19°47'48.0768"N, 79°19'27.4908"E) Farm land area				
Species		Nos	Stem circumference (DBH in cm)	Height (m)
Common name	Scientific name			
Trees				
Polash	*Butea monosperma* (Lam.) Taub.	1	120	7
Jangli jilebe	*Pithecellobium dulce* (Roxb.) Benth.	1	20	3
Herb				
Karandi	*Abutilon pannosum* (G.Forst.) Schltdl	1		
Chirchita	*Achyranthes aspera* L	2		
Wild bhindi	*Hibiscus panduriformis* Burm.f	2		
Grasses				
Durva	*Cyanodon dactylon* L.	3		
Wild lemon grass	*Cymbopogon nardus* (L.) Rendle	4		
Spear grass	*Heteropogon contortus* (L.) P.Beauv.	5		

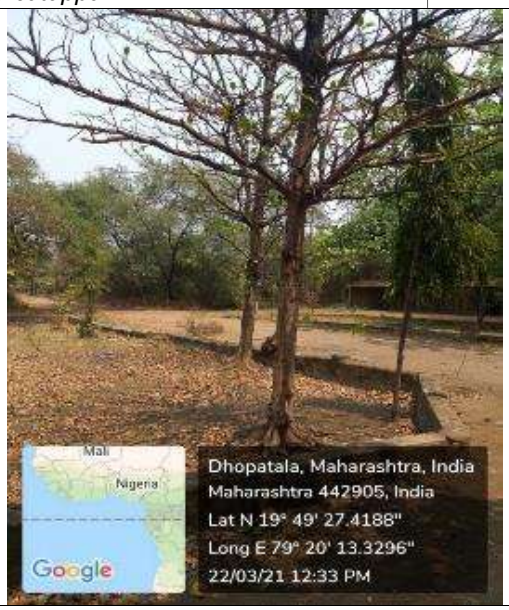


Buffer zone 1 (19°49’ 11.86" N, 79° 20’29.73” E) Near old mine				
Species		Nos.	Stem Circumference (cm)	Height (m)
Common Name	Scientific Name			
Trees				
Hairy Fig	*Ficus hispida* L. F.	2	40, 80	04, 05
Shrubs				
Broom Creeper	*Cocculus hirsutus* (L.) Diels	2		
Wild sage	*Lantana camera* L.	2		2
Kambojini	*Phyllanthus reticulatus* Poir.	1		8
Herbs				
Bushmint	*Hyptis suaveolens* (L.) Poit.	3		
Long stalked sida	*Sida cordata* L.	4		

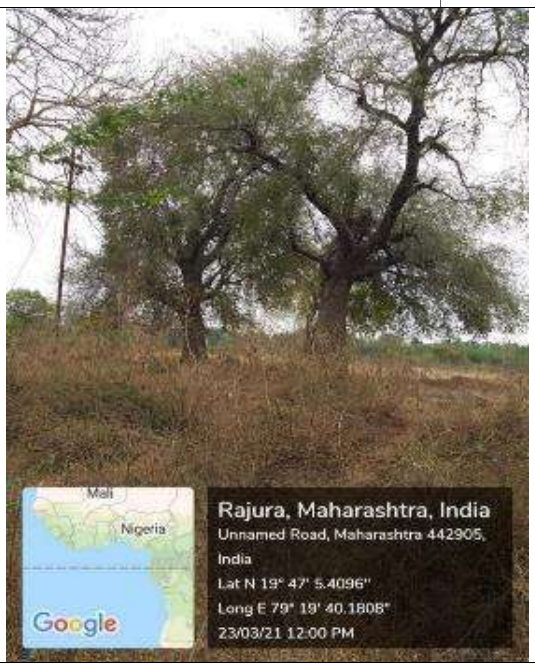
Buffer Zone 2(19°49’ 10.82" N, 79° 20’15.24” E) Old mine dump plantation.				
Species		Nos.	Stem Circumference (cm)	Height (m)
Common Name	Scientific Name			
Trees				
Mesquite.	*Prosopis juliflora* (Sw.) DC.	6	80 -100	8-9
Shrubs				
Wild sage	*Lantana camera* L.	2		2
Geloy	*Tinospora cordifolia* (Willd.) Miers ex Hook. F. & Thoms.	1		8
Herbs				
Atibala	*Abutilon pannosum* (Forst. F.) Schlect	4		
Long stalked sida	*Sida cordata* L.	3		



Buffer zone 3 (19°49’ 27.41" N, 79° 20’13.32” E) Near site office				
Species		Nos	Stem Circumference (cm)	Height (m)
Common Name	Scientific Name			
Trees				
False asoca	*Monoon longifolium* Sonn. B.Xue & R.M.K.Saunders	1	40	6
Beach almond	*Terminalia catappa* L.	2	80, 90	8, 9

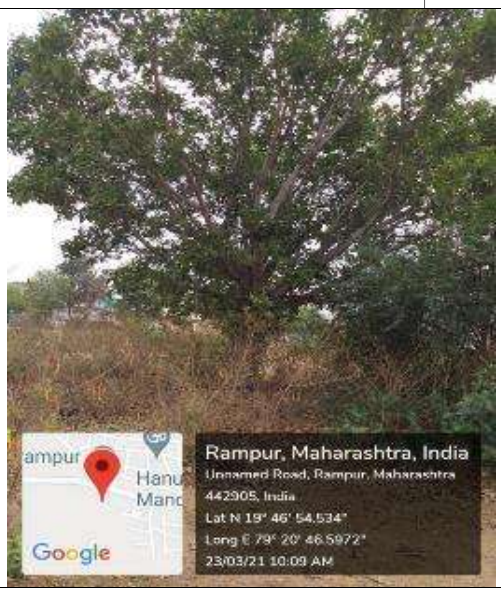


Buffer zone 4(19°47’ 5.40" N, 79° 19’40.18” E) Roadside trees.				
Species		Nos.	Stem Circumference (cm)	Height (m)
Common Name	Scientific Name			
Trees				
Tamarind	*Tamarindus indica* L.	2	300, 350	13, 16
Shrub				
Wild sage	*Lantana camera* L.	4		2

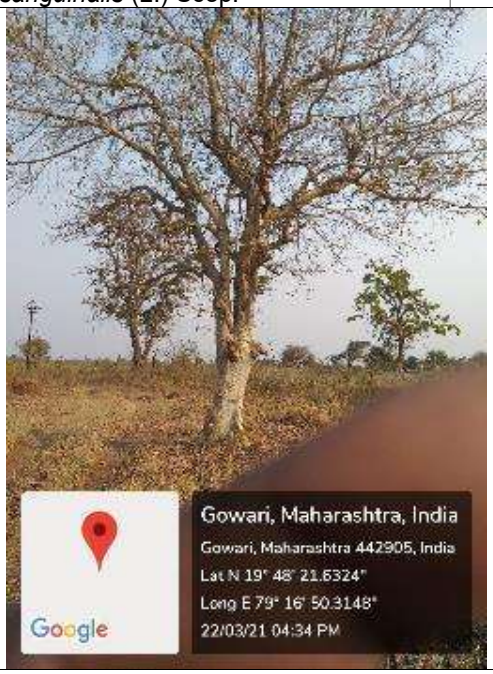


Buffer zone 5(19°47’ 11.84" N, 79° 21’6.20” E) Edges of farm land				
Species		Nos	Stem Circumference (cm)	Height (m)
Common Name	Scientific Name			
Trees				
Palm tree	*Borassus flabellifer* L.	3	230-250	20-24
Herb				
Mharbir	*Blumea paniculata* (Willd.) M.R.Almeida	5		
	Strobilanthes urens (B.Heyne ex Roth) J.R.I.Wood	10		
Kokilaksha	*Hygrophila auriculata* (Schumach.) Heine	4		2
Brazil Jute	*Malachra capitata* (L.) L.	4		1

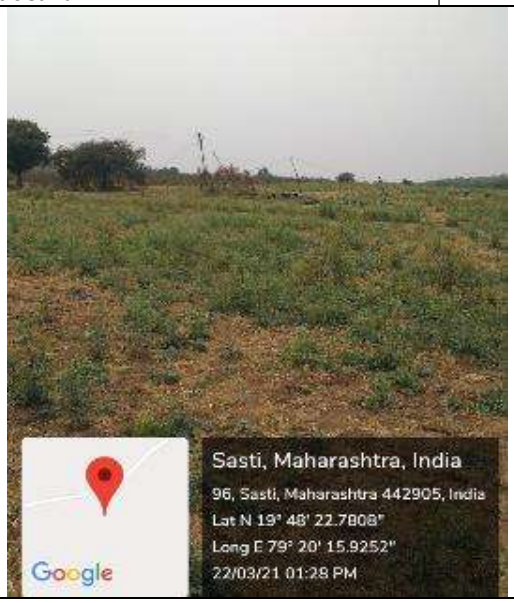
Buffer zone 6 (19°46’ 54.53" N, 79° 20’46.59” E) Forest area				
Species		Nos.	Stem Circumference (cm)	Height (m)
Common Name	Scientific Name			
Trees				
Banyan tree	*Ficus bengalensis* L.	1	260	19
Shrub				
Wild sage	*Lantana camera* L.	4		
Herb				
Panward	*Senna tora* L.	4		
Wire weed	*Sida acuta* L.	5		



Buffer Zone 7 (19°48’ 21.63" N, 79° 16’50.31” E) Near Nala				
Common name	Scientific name	Nos.	Stem circumference (DBH in cm)	Height m
Trees				
Kaim	*Mitragyna parvifolia* (Roxb.) Korth.	1	150	9
Herbs				
Water mimosa	*Neptunia oleracea* Lour.	1		
	Triumfetta rotundifolia Lam.	1		
Grasses				
Durva	*Cyanodon dactylon* L.	3		
	Digitaria sanguinalis (L.) Scop.	2		



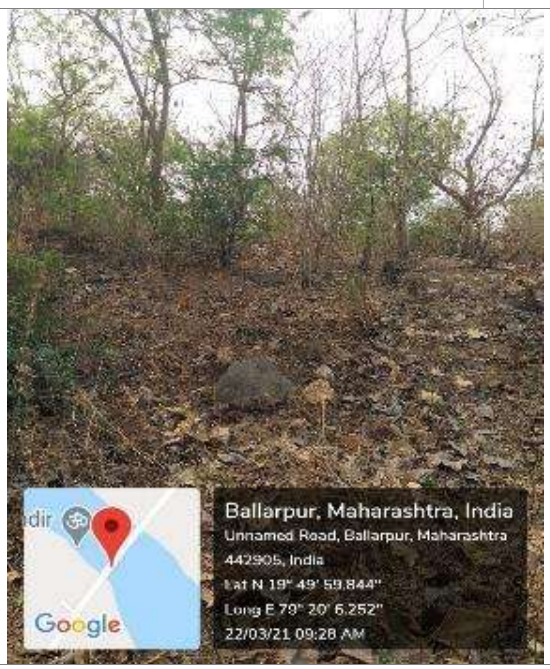
BZ 8 (19°48'22"N, 79°20'15"E) Farm land				
Species		Nos	Stem circumference (DBH in cm)	Height (m)
Common name	Scientific name			
Trees				
Congress weed	*Parthenium hysterophorus* L.	6		1
Chimati saag	*Polygonum plebeium* R.Br	2		
Camel Bush	*Trichodesma zeylanicum* (Burm.f.) R.Br.	2		1
Crop				
Wheat	*Triticum aestivum* L.	7		1



Buffer Zone 9 (19°46’ 57.11" N, 79° 20’25.02” E) Forest area				
Species		Nos	Stem Circumference (cm)	Height (m)
Common Name	Scientific Name			
Trees				
Tendu	*Diospyros melanoxylon* Roxb.	1	210	12

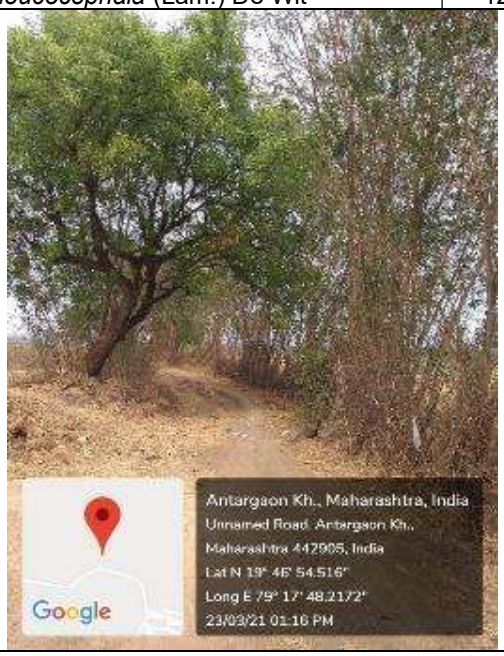
BZ 10 (19°46’ 51.01" N, 79° 21’21.92” E) Town area				
Species		Nos	Stem Circumference (cm)	Height (m)
Common Name	Scientific Name			
Trees				
Sirish	*Albizia lebbeck* (L.) Willd.	1	240	15

Buffer zone 11 (19°49’ 59.84" N, 79° 20’6.25” E) Near old mine				
Species		Nos	Stem circumference (DBH in cm)	Height (m)
Common name	Scientific name			
Trees				
Mesquite	*Prosopis juliflora* (Sw.) DC	2	30, 60	4, 9
Sagwan	*Tectona grandis* L.	2	30, 50	6,7
Herbs				
Long stalked sida	*Sida cordata* L.	4		

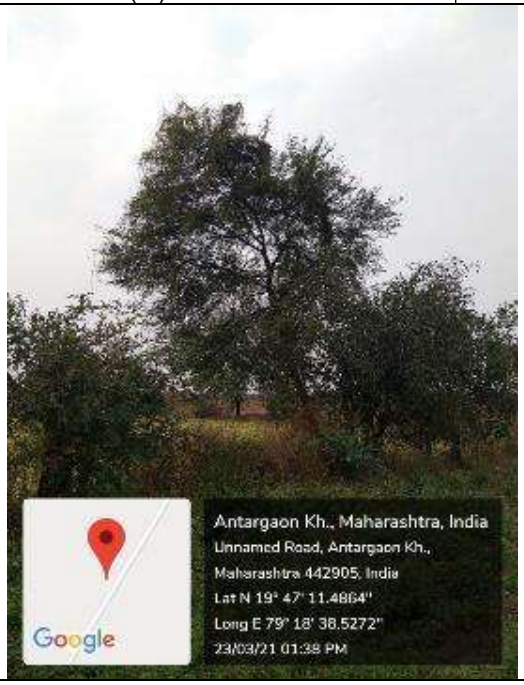


Buffer zone 12 (19°47’ 15.64" N, 79° 17’1.5” E) Farm land				
Species		Nos.	Stem Circumference (cm)	Height (m)
Common Name	Scientific Name			
Trees				
Jangli sargua	*Moringa concanensis* Nimmo,	1	140	9
Ber	*Ziziphus mauritiana* Lam.	1	20	3
Herbs				
Kanphuli	*Tridax procumbens* L.	2		

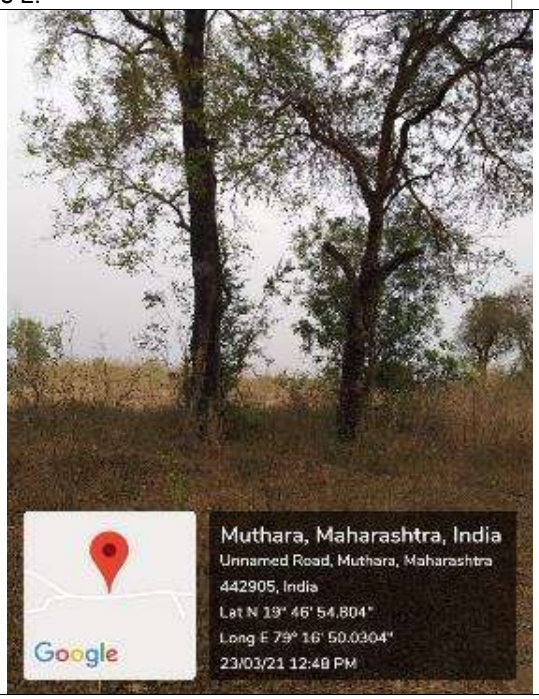
BZ 13 (19°46'54.516"N, 79°17'48.2172"E) Farm land				
Species		Nos	Stem circumference (DBH in cm)	Height (m)
Common name	Scientific name			
Trees				
	Azadirachta indica A. Juss.	1	100	8
Subabul	*Leucaena leucocephala* (Lam.) De Wit	12	20-30	10



BZ 14 (19°47'11.48"N, 79°18'38"E				
Species		Nos	Stem circumference (DBH in cm)	Height (m)
Common name	Scientific name			
Trees				
Babul	*Acacia nilotica* (L.) Del.ssp. Indica (Benth.) Brenan	1	90	11
Green ebony persimmon	*Diospyros chloroxylon* Roxb.	1	70	4
Ber	*Ziziphus mauritiana* Lam.	1	60	5
Shrub/Climber				
Akasha valli	Cassytha filiformis L.	1		11
Herb				
Indian Catmint	*Anisomeles indica* (L.) Kuntze	1		
Crop				
Jowar	*Sorghum bicolor* (L.) Moench	6		1



Buffer zone 15 (19°46’ 54.80" N, 79° 16’50.03” E) Village road side				
Species		Nos	Stem circumference (DBH in cm)	Height (m)
Common name	Scientific name			
Trees				
Safed babul	*Acacia leucophloea* (Roxb.) Willd.	1	90	12
Axle wood	*Anogeissus acuminata* (Roxb. Ex DC.) Guill. & Perr.	1	160	16
Neem	*Azadirachta indica* A. Juss.	2	20	4
Shrub				
Wild Sage	*Lantana indica* L.	2		4
Herb				
Vajradanti	*Barleria prionitis* L.	5		



7.0 PROPOSED MITIGATION MEASURES:

1. **Provision of safe blasting:**
   In order to avoid disturbance to wild animals, the use of blasting operations should be strictly avoided at night.

2. **Lightening system:**
   Usage of use minimal light during the night on the infrastructure in the mining area of the forest. The wild animals are primarily nocturnal, and excess light usually distracts them.

3. **Signs and signages:**
   Signs and signages of warning/awareness of wildlife shall be put up at the Project office, working place, rest house, etc. & at the identified habitat of wildlife corridor. The following five categories can be installed, viz. Caution signs, Enhanced caution signs.

4. **Awareness & Training Programme:**
   Awareness/ training programmes will be organised for WCL project officers/ staff/ local villages for their involvement/ support in wildlife/ biodiversity conservation. Participation of villagers in conservation and habitat improvement efforts should also be ensured.

5. **Increasing the tree cover in the area for shelter and roosting of Birds.**
   This will be achieved by planting of tree groves. Species like Azadirachta indica (Neem), Madhuca longifolia (Mahuwa), Mangifera indica (Aam), Albizia sp. (Siris), Cassia fistula (Amaltash), Dalbergia sissoo (Shesham), Butea monosperma (Dhak), Acacia catechu (Khair), Acacia nilotica (Babool), Prosopis juliflora (Kikar), trees etc. will be planted.

6. **Biological Fences:**
   Conflicts generally arises when Carnivores enters in croplands and human settlements, which indirectly reflect the condition of adjacent forested areas, i.e. its ability to support leopard. Protective Fencing to Protect Livestock: Biological fences will be used to protect the livestock from the Carnivores attack.

7. **Strict Protection Measures:**
   The Wildlife (Protection) Act of 1972 provides us with the statutory framework for wildlife conservation, and Poaching is a crime against wildlife. During interview and discussion with local people it was noted that study area is not prone to poaching or any other wildlife violence related to leopard. But precaution will be always taken while dealing with wildlife. The contact information of concern wildlife and forest department will be provided to every worker or at the field office. If any kind of poaching or other offense is noticed; it will be immediately clued-up to the concern Forest and Wildlife Officials. More importantly, worker will make aware of wildlife crime and subsequent penalties and punishment.

8. **Development of Water hole:**
   Water holes will be constructed at the area where carnivores generally (nearby habitat). Location of water holes will be suggested by the forest department. Water will be supplied during summer seasons through tankers in the village to fill the ponds or water holes.

9. **Prevention of Forest Fire:**
   In the forest area having dry grass lands or bushy vegetation, fire incidences are common. Main reason for fire is stubble burning in the agriculture land and for inducing fresh flush of grass. It has a damaging effect on the soil and affects growth of naturally regenerated

seedlings. Burning of leaf litter also makes the soil prone to erosion in the incoming rain. Incident of forest fire will be minimized through forming a fire line around the forest area. The following measures are therefore proposed to be taken to prevent forest fire:

Fire Fighting Equipment**:** These Fire watchers will also be equipped with certain Fire Fighting Equipment such as Fire resistance dress, Leaf Blowers, Water bottle, Axe, Shoes etc. to attend to emergencies. Therefore, financial provision has been made for fire-fighting equipment. Clearing of Fire Line over a vulnerable area.

It is always better to have controlled burning as a management tool. Otherwise, fire is harmful because it leads to loss of cover of herbivores as well as destruction of eggs and nests of ground birds like Jungle fowl quail, peafowl and partridge or bush living birds. Besides it accelerates soil erosion, deteriorate the forest and ultimately reduce the aesthetic value of the forest.

10. Safeguards during construction phase:

During the construction phase, various adverse impacts on the forest and wildlife are anticipated in the surrounding areas of the proposed project in terms of increased noise levels, release of air and water pollutants, etc.

To avoid and minimize the negative impacts of these activities, project authorities are advised to adopt guidelines as suggested below:

i. Minimum levels of noise during construction activities will be maintained and ambient noise should be monitored periodically at different locations as outlined in Environment Monitoring Program.
ii. Strict restrictions shall be imposed on the workers at project sites to ensure that they do not harvest any species/produce from the forests and cause any danger or harm to the animals and birds in the wild
iii. Contractors do not set up labour colonies in the vicinity of forests and wilderness areas.

11. Captive Breeding Programme:

An ex-situ intervention to conserve avifaunal species (Indian Peafowl) is needed to survive the growing pressures of urbanization and infrastructure development. The captive breeding programme will require a few years to become successful as these birds are slow breeders. Parallelly, its prime habitat has to be protected and prepared for the captive breed stock to be released into the wild.

12. Development of Grasslands/patches:

This needs to be ensured for herbivore species to improve the prey species, including the rodent population that are also eaten by carnivore. Habitat improvement should involve developing grass patches in the area that are open in consultation with Forest Department.

13. Wildlife Health:

Efforts will be made to immunize the domestic animals in and around the proposed area against contagious diseases like Food & Mouth disease, Rinderpest etc. In order to avoid the spread of disease the stall feeding should be encouraged by supporting grassland development on community or private fellow land. Govt. of India, MoEF has put up a condition to set up a center for wildlife health monitoring. It will be an important initiative because in case of injury of wild animals in road accident or due to conflict, it is very difficult to find a doctor or place for first aid. Provision has been made in budget proposal for creation of such separate center in existing Veterinary hospital campus.

8.0 BUDGET FOR WILDLIFE CONSERVATION PLAN

The provisions in the budget have been designed to improve the habitat in terms of food, water and shelter. Attempt has been taken to reduce the human-animal interface conflicts by habitat improvement for wildlife, awareness programme and training programme for the villagers. Provision for regular monitoring by the forest officials has been made to ensure that all condition imposed by Govt. of India should be adhere to its letter and spirit. The total budgetary provision has been summarized into annual work plan with a provision of annual outlay in tabulate form for each component.

Sl. No.	Component	Unit cost	Units	Financial (Rs. in lakhs)
1	**Capacity Building & Awareness Programme**			
a	Technical training to the Frontline Staff regarding rescue and rehabilitation of wild animals.	Rs.1.00 lakh/ training	5	5.00
b	Training to Wildlife employees/ staff regarding awareness/ precautions during Human-Wildlife conflict	Rs.0.5 lakh/ training	10	5.00
c	Equipment for PRT	LS	1	8.00
d	Training of staff in other acclaimed institutes outside territorial limits	Rs.0.4 lakh/ training	10	4.00
2	**Research and wildlife monitoring**			
a	Appointment of GIS expert and Data analyst to enable decision support system for the division using collected data for 3 years	LS	1	12.00
b	Appointment of Researcher and Field assistant for 3 years for study of the movement pattern of wildlife and change in the movement pattern due to conflict, in the project impact area.	LS	1	12.00
c	Appointment of Biologist for 3 years for monitoring and maintaining the record of wildlife	LS	1	12.0
d	Strengthening of Wildlife Research Cell by establishment of Wildlife Research and Monitoring Control Room with state of art technology as a central unit at Division Level	LS	1	20.00
3	**Conservation Education & Allied initiatives**			
a	Conservation based education initiatives on wildlife behavior and response to human-wildlife conflict involving local people and educational institutions	Rs.1.00 lakh/year	10	10
4	**Machinery and Equipment for mitigating human- wildlife conflicts**			
a	Infrastructure and machinery for wildlife protection and monitoring	Rs.10.00 lakhs	1	10.00
b	Development of veterinary facilities for wildlife by appointing a veterinarian for 2 years	Rs.8 Lakhs	1	8.00
c	Establishment of Veterinary facility for wildlife	LS	1	10.00

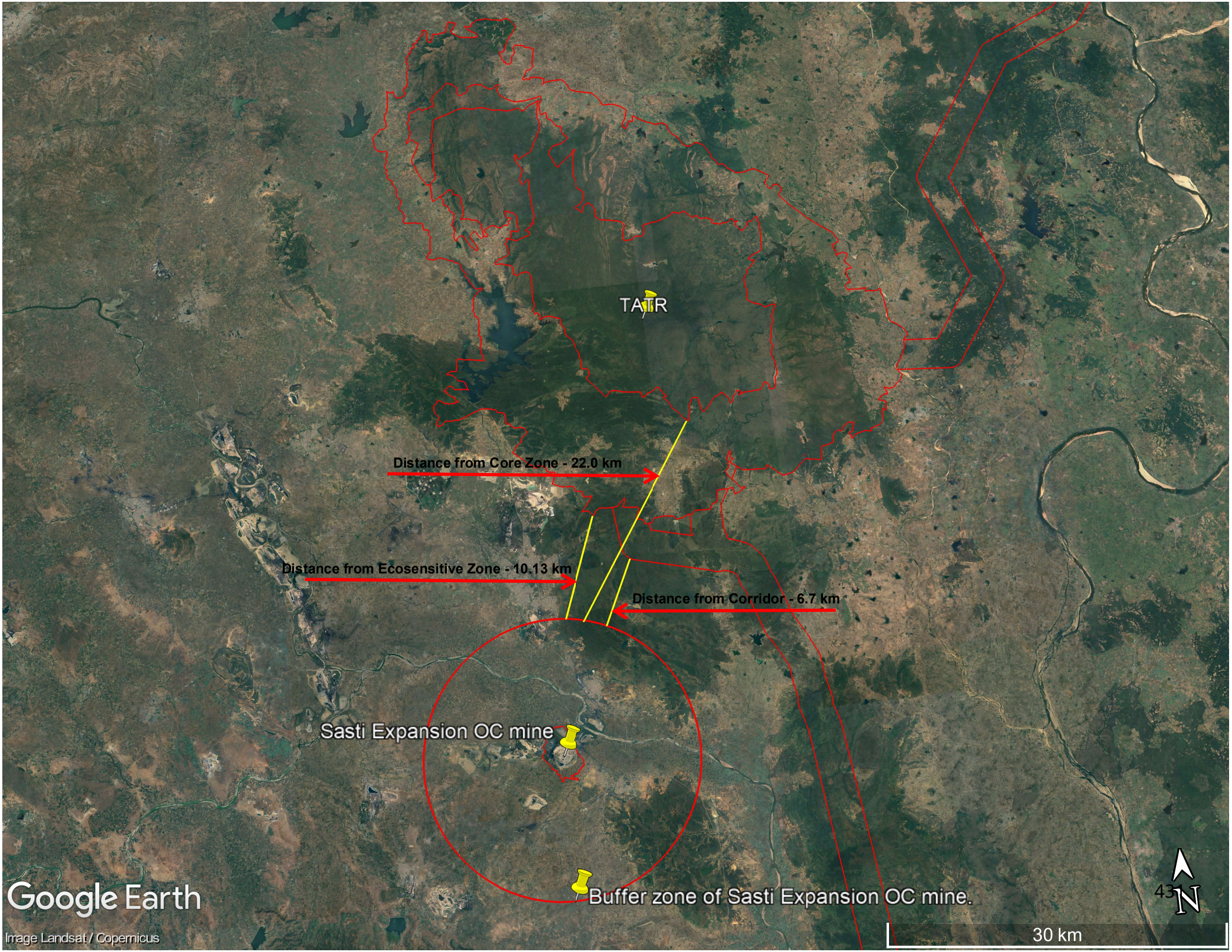
d	Augmentation and Maintenance of Rapid Response Team at Rajura	LS	1	10.00
e	E surveillance system for monitoring wildlife in human nominate areas to mitigate human wildlife conflict.	LS	1	10.00
5	**Other Miscellaneous Funds & site-specific measures machinery**			
a	Awareness Rallies and programmes	LS	1	3.00
b	Establishment of mobile Alert and Early Warning System at division level	LS	1	15.00
	Total			**154.00**

(Swetha Boddu)

Dy. Conservator of Forests,
Central Chanda Forest division,
Chandrapur

S.no	Component	Unit Cost	Units	Total Financial Provision	Yr-I	Yr-II	Yr-III	Yr-IV	Yr-V	Yr-VI	Yr-VII	Yr-VIII	Yr-IX	Yr-X
		(Rs. In lakhs)												
1	**Capacity Building & Awareness Programme**													
a.	Technical training to the Frontline Staff regarding rescue and rehabilitation of wild animals.	Rs.1.00 lakh/ training	5	5.00	1.00	1.00	1.00	1.00	1.00					
b.	Training to Wildlife employees/ staff regarding awareness/ precautions during Human-Wildlife conflict	Rs.0.5 lakh/ training	10	5.00	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
c.	Equipment for PRT	LS	1	8.00	8.00									
d.	Training of staff in other acclaimed institutes outside territorial limits	Rs.0.4 lakh/ training	10	4.00	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
2.	**Research and wildlife monitoring**													
a.	Appointment of GIS expert and Data analyst to enable decision support system for the division using collected data for 3 years	LS	1	12.00	12.00									
b.	Appointment of Researcher and Field assistant for 3 years for study of the movement pattern of wildlife and change in the movement pattern due to conflict, in the project impact area.	LS	1	12.00	12.00									
c.	Appointment of Biologist for 3 years for monitoring and maintaining the record of wildlife	LS	1	12.0	12.0									
d.	Strengthening of Wildlife Research Cell by establishment of Wildlife	LS	1	20.00	20.00									

	Research and Monitoring Control Room with state of art technology as a central unit at Division Level													
3	**Conservation Education & Allied initiatives**													
a.	Conservation based education initiatives on wildlife behavior and response to human-wildlife conflict involving local people and educational institutions	Rs.1.00 lakh/year	10	10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4	**Machinery and Equipment for mitigating human- wildlife conflicts**													
a.	Infrastructure and machinery for wildlife protection and monitoring	Rs.10.00 lakhs	1	10.00	10.00									
b.	Development of veterinary facilities for wildlife by appointing a veterinarian for 2 years	Rs.8 Lakhs	1	8.00	8.00									
c.	Establishment of Veterinary facility for wildlife	LS	1	10.00	10.00									
d.	Augmentation and Maintenance of Rapid Response Team at Rajura	LS	1	10.00	10.00									
e.	E surveillance system for monitoring wildlife in human nominate areas to mitigate human wildlife conflict.	LS	1	10.00	10.00									
5	**Other Miscellaneous Funds & site-specific measures machinery**													
a.	Awareness Rallies and programmes	LS	1	3.00	3.00									
b.	Establishment of mobile Alert and Early Warning System at division level	LS	1	15.00	15.00									
	Total			**154.00**	132.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90


TATR
Distance from Core Zone - 22.0 km
Distance from Ecosensitive Zone - 10.13 km
Distance from Corridor - 6.7 km
Sasti Expansion OC mine
Buffer zone of Sasti Expansion OC mine.
Google Earth
Image Landsat / Copernicus
30 km
N

WESTERN COALFIELDS LIMITED
OFFICE OF THE SUB AREA MANAGER
SASTI SUB AREA, BALLARPUR AREA

Ref No. WCL/BA/AGM/ENV/1440 Date:14/05/2025

To
Addl. Principal Chief Conservator of Forests,
Ministry of Environment, Forest & Climate Change
Integrated Regional Office, Ground Floor, East
Wing, "New Secretariat Building", Civil Lines,
Nagpur, Maharashtra- 440001

Sub: - Submission of Six monthly EC Compliance Report in respect of **SASTI OC MINE**, Ballarpur Area, WCL for the period from 1st October 2024 to 31st March 2025.

Respected Sir,
Please find enclosed herewith the Six Monthly EC Compliance Report in respect of Sasti Opencast Project, Ballarpur Area for the period from 1st October 2024 to 31st March 2025.
EC NO: J-11015/435/2006-IA.II(M) Dated:- 17.05.2007
EC NO: J-11015/435/2006-IA.II(M) Dated:- 13.09.2023

Thanking you.

Encl. Environment Compliance Report

Yours Faithfully

Sub Area Manager
(Sasti Sub Area)

Copy To,
1. Regional Officer, MPCB Chandrapur.
2. AGM, Ballarpur Area , WCL
3. The General Manager (Env) WCL, Nagpur
4. GM (Environment), CMPDIL RI – IV, Nagpur
5. Area Nodal Officer (Env), Wani Area.
6. Office Copy

BALLARPUR

FOR INTERNAL TRANSPORT
SASTI OPENCAST MINE
BALLARPUR AREA
BALLARPUR
GATE PASS/TICKET

DATE : 07/05/2025 WEIGHMENT SLIP TIME : 10:30:49

TRUCK NO.	: HR39D4189	SLNO	: 25-05-000343
INV/GPNO	: 51		
CUSTOMER Code	: BMT	CUSTOMER Name	:BANTY MAHALA TRANSPORT CO
PRODUCT Code	: G-11	PRODUCT Name	:CRUSH COAL
FROM Code	: SEOC	FROM Name	:SASTI EXPN OCM
TO Code	: GD	TO Name	:GOURI DEEP RAILWAY SIDING
TRANSPOTER Code	: BMT	TRANSPOTER Name	:M/S BANTY MAHALA TRANSPORT CO
GROSS	: 57840 Kgs	GROSS DATE : 07-05-2025	TIME : 10:30:48
TARE	: 17220 Kgs	TARE DATE : 06-05-2025	TIME : 12:46:37
NET	: 40620 Kgs		

Leakage

WEIGHED BY

PARTY SIGN

433

DIGITAL
BALLARPUR

FOR INTERNAL TRANSPORT
SASTI OPENCAST MINE
BALLARPUR AREA
BALLARPUR
GATE PASS/TICKET

DATE : 07/05/2025 WEIGHMENT SLIP TIME : 14:27:09

TRUCK NO	: MH29BE8929	SLNO	: 25-05-000350
INV/GPNO	: 299		
CUSTOMER Code	: BMTC	CUSTOMER Name	:BANTY MAHALA TRANSPORT CO
PRODUCT Code	: CRU	PRODUCT Name	:CRUSH COAL
FROM Code	: ST24	FROM Name	:24 NO STOCK SURFACE MINER SOCM
TO Code	: BCUG	TO Name	:BALLARPUR BC SIDING
TRANSPOTER Code	: BMTC	TRANSPOTER Name	:BANTY MAHALA TRANSPORT CO
GROSS	: 59040 Kgs	GROSS DATE : 07-05-2025	TIME : 14:26:44
TARE	: 16550 Kgs	TARE DATE : 06-05-2025	TIME : 10:35:19
NET	: 42490 Kgs		

C/P

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PARTY SIGN

DIGITAL
BALLARPUR

FOR INTERNAL TRANSPORT
SASTI OPENCAST MINE
BALLARPUR AREA
--BALLARPUR-
GATE PASS/TICKET

103

DATE : 07/05/2025 WEIGHMENT SLIP TIME : 09:57:40

TRUCK NO	: MH29BE8928	SLNO	: 25-05-000341
INV/GPNO	: 291		
CUSTOMER Code	: BMTC	CUSTOMER Name	:BANTY MAHALA TRANSPORT CO
PRODUCT Code	: CRU	PRODUCT Name	:CRUSH COAL
FROM Code	: ST24	FROM Name	:24 NO STOCK SURFACE MINER SDCM
TO Code	: BCUG	TO Name	:BALLARPUR BC SIDING
TRANSPOTER Code	: BMTC	TRANSPOTER Name	:BANTY MAHALA TRANSPORT CO
GROSS	: 58690 Kgs	GROSS DATE : 07-05-2025	TIME : 09:57:39
TARE	: 16770 Kgs	TARE DATE : 07-05-2025	TIME : 09:34:42
NET	: 41920 Kgs		

Ledanse

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DIGITAL
BALLARPUR

BCUG/BMTC
Date :- 12/05/2025
'C' Shift

FOR INTERNAL TRANS T
SASTI OPENCAST MI
BALLARPUR AREA
BALLARPUR
GATE PASS/TICKET

DATE : 12/05/2025 WEIGHMENT SLIP TIME : 21:39:06

TRUCK NO	: MH29BE9060	SLNO	: 25-05-000514
INV/GPNO	: 482		
CUSTOMER Code	: BMTC	CUSTOMER Name	:BANTY MAHALA TRANSPORT CO
PRODUCT Code	: CRU	PRODUCT Name	:CRUSH COAL
FROM Code	: ST24	FROM Name	:24 NO STOCK SURFACE MINER SOCM
TO Code	: BCUG	TO Name	:BALLARPUR BC SIDING
TRANSPOTER Code	: BMT	TRANSPOTER Name	:M/S BANTY MAHALA TRANSPORT CO
GROSS	: 59100 Kgs	GROSS DATE : 12-05-2025	TIME : 21:39:05
TARE	: 16790 Kgs	TARE DATE : 12-05-2025	TIME : 09:08:55
NET	: 42310 Kgs		

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Data Forms Pvt. Ltd. 2023

ACTION TAKEN REPORT FOR PUBLIC HEARING MINUTES OF SASTI EXPANSION OC PROJECT HELD ON 16/03/2023

1) Shri Babanrao Urkude, Village – Gouri village, Taluka – Rajuara, District – Chandrapur :-

Sr	Objection / Information / Question	Answers / Assurances given by Project Promoter / Environmental Consultant / Environmental Public Hearing Committee as per discussion	Action Taken/ Status as on 15/06/2023	Budget Provision	Timeline for Completion
1)	I am a resident of Gauri village and my wife is Sarpanch of Gauri village. Our Gauri village land is also in the project for which this public hearing is going on. A few years ago, land was acquired for Pauni-2 and Pauni-3 through an agreement with the local people. However, my question to the WCL company and Government Officials is that when the land was acquired, the local people made an agreement to give the land by trusting the national interest and faith on the Project Proponent- WCL	Project Officer replied in Hindi that Shri Baban Urgade had asked the right questions. Thanks to him for that. He asked about Gat No.139 of Pauni-2. In 2004, the land of pauni-2 was acquired under CBA Act. In 2015, the land of Pauni-3 was acquired. After publication in 2004, it was found that the original owner had carried sale deeds with three different persons. Therefore, the remaining land has been acquired in 2015. Project Officer said that we have already sent a proposal to the Headquarters to give job opportunities as per policy to the Project Affected Persons (PAPs) and it is under consideration. We are trying for the positive decision.	This issue of land acquisition is not related to Sasti Expansion OC Mine. In the year 2004, and year 2015, the land of Pauni-2 and Pauni-3 was acquired under CBA Act. After publication in 2004, it was found that the original owner had carried sale deeds with three different persons. In view of the same, the remaining land has been acquired in year 2015. However, Project proponent would like to highlight that Land acquisition is done through proper procedure as per the rules laid out by Government. The mine is following the R&R policy of the CIL, 2012 for matters related to employment and resettlement. The details of employment provided by project proponent for the earlier EC are given below. In specific reference to Sasti project, details of land Compensation paid along employment generated and future provision is Attached as **ANNEXURE 1.** Employment to be generated in this expansion is 211 no.s **The R&R Committee and Action Plan :**	Rs. 42 crores as land compensation.	By end of August 2023.

	Administration. Then came the another company. Still our Project affected Persons (PAPs) did not get jobs in the project. He further objected that survey no. 139 – Part of Group No. 1, 2, 3 went to pauni – 2. While its FSI was done in 2004, no agreement was reached with the farmers for the rest of it and the remaining land went to Pauni-3. Its FSI was done in 2015		District Rehabilitation and Resettlement Committee (DRRC) is constituted for the purpose of finalizing the mode of employments and other R&R issues for district where project is proposed. As per the directives of the policy the committee consists of : 1. Dy. Collector (RES.) District Collector, Chandrapur or his nominated representative. 2. General Manager, Genera Manager (Oprn), APO, APM, AFM, ASO of Ballarpur Area 3. Project Officer of the concerned project of the Ballarpur Area In future also, Employment against land and monetary Compensation benefits will be provided as per norms of CIL R&R policy.		
2)	In this regard, the company has signed an agreement for the entire part/area in which the jobs are approved.	Project Officer informed that the land acquired for the Sasti open cast, the first job, then the land acquisition agreement. while the land acquired for the Pauni expansion OC, 228 hectares of land has been acquired for this purpose. As per Clause 4, Clause 7 and Clause 9, the Government directives are to take care of the livelihood of the PAPs first, while the contract contains employment directives/provisions. Matter will be taken up with the District Collector, Chairman of the Committee and further action will be taken accordingly. Another thing is to	Land acquisition is done through proper procedure as per the rules laid out by Government. The mine is following the R&R policy of the CIL, 2012 for matters related to employment and resettlement. In this regard, company has formed an R&R Committee for sorting out the land employment and compensation related matters: **The R&R Committee and Action Plan :** District Rehabilitation and Resettlement Committee (DRRC) is constituted for the purpose of finalizing the mode of employments and other R&R issues for district where project is proposed.	Rs. 42 crores as land compensation.	By end of August 2023.

		provide compensation for land acquisition as directed by Maharashtra Government. Hence, everyone is requested to submit their agreement to the Project Administration. So, it will be convenient to give compensation and R&R Benefit. Also, you should make an agreement as soon as possible, we are ready to give you both compensation and job opportunity. A compensation of 42 crores has been approved for the project victims.	As per the directives of the policy the committee consists of : 1. Dy. Collector (RES.) Distric Collector, Chandrapur or his nominated representative 2. General Manager, Genera Manager (Oprn), APO, APM, AFM, ASO of Ballarpur Area 3. Project Officer of the concerned project of the Ballarpur Area In this regard Project has requested to villagers to submit their land agreement timely to the Project Administration so that land related formalities and monetary compensation i.e R&R Benefit will be given to the eligible persons, at the earliest. Also, a compensation of 42 crores has been approved for the project victims and it will be ensured that this compensations will be given to eligible persons at the earliest. In this regard, Government has formed an Grievance Redressal Committee for sorting out the employment and compensation related matters: **Grievance Redressal Committee** : All the grievances of the land outsee are being dealt as per Grievance Redressal Committee which is formed at the district level to sort out the issues of the land outsees as per the CBA, 1957 with the following members:		

			1. District Collector- Chairman 2. MP/ Representative of MP- Member 3. MLA/ Representative of MLA- Member 4. Chairman, Panchayat Samitee- Member 5. Sub- Divisional Revenue Officer/ Sub- Divisional Magistrate- Member 6. Area General Manager, Ballarpur Area There is also an online platform available to the citizens 24x7 to lodge their grievances to the public authorities through website named as Centralized Public Grievance Redress and Monitoring System (CPGRAMS).		

3)	Even now the company has not given jobs to the Project Affected Persons (PAPs). If the local farmers had agreed to give land in exchange for employment, further action was expected accordingly. We will not tolerate injustice done to local farmers. Even though there is no fault of the farmers, the company has not given the job yet. They have not been given a job for the last four years, but the Mine has already started.	Project Officer informed Shri Baban Urkude that whatever will be done as per the Law only. We promise Baban Urkude that he will not suffer any harm and the issues will be resolved properly. Sometimes there are time delays, but what is according to the rules, will be paid.	Land acquisition is done through proper procedure as per the rules laid out by Government. The mine is following the R&R policy of the CIL, 2012 for matters related to employment and resettlement. In this regard, company has formed an R&R Committee for sorting out the land employment and compensation related matters: **The R&R Committee and Action Plan :**District Rehabilitation and Resettlement Committee (DRRC) is constituted for the purpose of finalizing the mode of employments and other R&R issues for district where project is proposed. As per the directives of the policy the committee consists of : 1. Dy. Collector (RES.) District Collector, Chandrapur or his nominated representative. 2. General Manager, General Manager (Oprn), APO, APM, AFM, ASO of Ballarpur Area 3. Project Officer of the concerned project of the Ballarpur Area In this regard, Project has ensured timely allotment of employment and compensation to the land effected villagers but sometimes delay has been observed due to agreement related issues. Either late submission by villagers or due to in non-compliance with the Company's policy/norms of Act. However, it has been requested to villagers to submit their land agreement timely to the Project Administration so that land related formalities and monetary compensation i.e R&R Benefit will be given to the eligible persons, at the earliest as per policy/norms. Further a grievance redressal committee is formed to address compensation and employment related matters.	Rs. 42 crores as land compensation.	By end of August 2023.

<table>
<tr>
<td>4)</td>
<td>We are always co-operating with the company. The farmers, local people and the area should be developed here. We have taken the role of co-operation and the company should take the role of co-operation and give employment contract in the project to the concerned project victims</td>
<td>Project Officer said that as per Section 9 of the Pauni-2 and Pauni-3 project, the land belonged to the Government of India. However, according to the Supreme Court directives, it is mandatory to pay compensation to PAPs. Agreements have been made accordingly. So, all the persons who have made agreement will be paid as per rule.</td>
<td>In this regard, project proponent wants to highlight the fact that, company is always committed towards co-operating with the villagers and work of company is in the betterment of villagers only and nation and as a whole. Project proponent is committed towards providing employment and compensation against land to the villagers/eligible persons, as per government norms/company's policy.

Details of Land acquisition (R&R) benefits provided by WCL in Maharashtra, depicting company is effortlessly working for the betterment of villagers and affected persons:
<table>
<tr><th>State</th><th>Year</th><th>No. of PAPs from whom land was acquired</th><th>Area in Ha</th></tr>
<tr><td rowspan="5">Maharashtra (WCL)</td><td>2017-18</td><td>118</td><td>115.090</td></tr>
<tr><td>2018-19</td><td>15</td><td>17.050</td></tr>
<tr><td>2019-20</td><td>74</td><td>69.150</td></tr>
<tr><td>2020-21</td><td>1010</td><td>1011.610</td></tr>
<tr><td>2021-22</td><td>614</td><td>482.700</td></tr>
</table>
</td>
<td>Rs. 42 crores as land compensation.</td>
<td>By end of August 2023.</td>
</tr>
<tr>
<td>5)</td>
<td>Shri Baban Urkude opined that we local people have been patient so far. No farmer should be cheated. We hope you keep your promises.</td>
<td>Project Officer replied that as per the queries raised by Shri Baban Urkude, 232 posts have been sanctioned for Dhuptala OC Project and so far 19 persons have been given contract of employment.</td>
<td>In this regard, project proponent wants to highlight the fact that, company is always committed towards co-operating with the villagers and work of company is in the betterment of villagers only and nation and as a whole. Project proponent is committed towards providing employment and compensation against land to the villagers/eligible persons, as per government norms/company's policy. Also, company ensures that</td>
<td></td>
<td></td>
</tr>
</table>

			no person is cheated in any way and in this regard, Government has formed a Grievance Redressal Committee for sorting out the employment and compensation related matters: **Grievance Redressal Committee**: All the grievances of the land outsees are being dealt as per Grievance Redressal Committee which is formed at the district level to sort out the issues of the land outsees as per the CBA,1957 with the following members: 1. District Collector- Chairman 2. MP/ Representative of MP- Member 3. MLA/ Representative of MLA- Member 4. Chairman, Panchayat Samitee- Member 5. Sub- Divisional Revenue Officer/ Sub- Divisional Magistrate- Member 6. Area General Manager, Ballarpur Area There is also an online platform available to the citizens 24x7 to lodge their grievances to the public authorities through website named as Centralised Public Grievance Redress and Monitoring System (CPGRAMS).		

2) Shri Jeevan Maruti Butle, Residence – Sasti, Taluka – Rajura, District – Chandrapur:-

Sr	Objection / Information / Question	Answers / Assurances given by Project Promoter / Environmental Consultant / Environmental Public Hearing Committee as per discussion	Action Taken/ Status as on 15/06/2023	Budget Provision	Timeline for Completion
1)	Welcoming Additional District Magistrate and other officials who came to the meeting. They should give justice to the local people. The tax of Sasti, Gauri and other 3-4 villages has not been received for the last two years. Our Gram Panchayat has not received tax. If the Gram Panchayat does not get the tax, then how will we carry development work in the village? Similarly, we have not received coal royalty for the last ten years. This topic has been discussed in front of the Present Minister of Chandrapur District,	Project Proponent replied in Hindi that upto 2021, we have paid all taxes. But we received an order from Ministry of Coal, Government of India in the year 2022 that the plot/land has acquired under C.B.(A&D) Act'1957 , no tax should be paid on it. This information has been given by the Central Government to the Maharashtra Government. Similarly, a case is pending in the court regarding the Gram Panchayat tax and the decision/outcome that comes will be acceptable to us. All correspondence will be made available, if requested by local people.	In this regard project proponent would like to highlight the fact that, Ministry of Coal, Government of India has issued an order in the year 2022 that the plot/land has acquired under C.B.(A &D) Act'1957, no tax should be paid on it. Copy enclosed as **ANNEXURE 2.** This information has been given by the Central Government to the Maharashtra Government. Similarly, a case is pending in the court regarding the Gram Panchayat tax and the decision/outcome of the decision-making body will be acceptable to company.		

	local people's representatives in the meeting with you. This coal royalty goes to other villages like Mul, pomburna, Abdul Kalam Azad, Bhadravati etc., but the villages, we find – Sasti, Gauri, Pauni, Sakhari etc. is not getting the royalty. This is wrong. We must get coal royalty.				
2)	He further objected that the Project Proponent said that sprinklers have been installed in the presentation to prevent dust pollution. This is totally a lie. Company provides tankers in the morning and later removes it. We told them to spray the water for four times, told through Gram Panchayat also, the villagers took out a march several times, cases were filed against us, but nothing was done by the company. We told	Project Proponent said that the issue of dust pollution is raised here. There are various pollution control measures at present are in place and in near future, we will implement more as per EIA /EMP. So, all the remedial plans will be implemented before starting the said mine. Also, the roads in Sasti and the surrounding area were damaged but will be improved at the earliest. Also the work of road development is going on at present. However in the near future, we will start a completely separate dispatch section from Sasti to Gadchandur road. In order to reduce dust generation due to road transportation an intermediate arrangement has been proposed for transportation of coal to Gauri Deep Siding. By the establishment of upcoming new railway siding at Gauri	In this regard, project proponent would like to state that project is committed towards controlling air pollution in and around the project due to mining activity. All Pollution control measures are in place working effectively at Sasti OC Project. However, project is committed towards the same by implementing new and latest techniques also (as per EIA/EMP) along with existing measures. **Details of the existing measures are given below:** ● 08 nos. of Fixed sprinklers provided at 100 MT weigh bridge. ● 06 nos. Fixed sprinklers provided at CHP. ● 04 nos. Fixed sprinklers along coal transportation road. ● Water spraying arrangement provided at mobile crusher. ● 11 nos. of rain guns installed at coal stockyard. ● Mobile crusher is covered with side cladding (CGI sheet) along with sprinklers to control dust pollution.		

	them to spray water upto the river at Sasti. Company doesn't do that. A list of trees to be planted was given through Gram Panchayat. We demanded that they should give us saplings. Not doing anything.	Deep OC mine, coal transport distances from mines will be drastically reduced, which is economically and environmentally sustainable. Also,as per the Approved Mining Plan CHP with Silo with Rapid loading System is coming after 3 yrs which will eliminate the coal transportation through trucks.	• Conveyor belt of mini CHP and main CHP are covered with CGI sheet. • Presently 05 Nos. of Mobile Water Tankers are provided for dust suppression (Hired-1 no. of 04 KL, Departmental – 2 no. of 28KL and HoE Contractor tanker of 28 KL each) • 01 no of hired road sweeping machine provided on coal transportation road. • Brooming and maintenance of coal transport road and weigh bridge road is done regularly. • Unloading point of CHP is equipped with mist spray sprinkling system. Receiving point and conveyor belt is fully enclosed. Fixed sprinkler is also installed at coal discharge point. • 01 no of Sedimentation tank for treatment of mine discharged water • 01 no of ETP of capacity 75 KL/day • Black topped road to control dust pollution. In this regard, company has recently ensured the NoC from PWD and developed the Black topped road of 1.8 km.) • Tarring of 06.00 km length of internal roads used by Coal Transportation trucks. • Coal carrying Trucks are covered with Tarpaulin and same is ensured by CCTV cameras installed at exit points. • Plantation of 169.15 Ha has been already done by FDCM and MPRVVN, to control dust pollution and to improve the aesthetic value of surroundings.**(Photos enclosed)** • Air quality Monitoring is carried out by CMPDIL fortnightly and it is evident that all values are well within the permissible limit. (Graphical representation of last 3 Years data is enclosed as **ANNEXURE 3**). • Regular Inspections are done by environment		

			officers and company and Maharashtra Pollution control Board time to time and it has been found that most of the control measure are in regular operation with some exceptions of breakdown. Photos of above stated measure enclosed as **ANNEXURE 4.** **Future proposals under pipeline:** ● 1 no of Tyre washing system will be in operation to control dust pollution. ● 5 nos. of Trolley mounted fogger system to control dust pollution ● 1 no. of CAAQMS system to monitor air quality 24*7 in and around the project. ● Plantation in an area of 47 Ha in and around the project to control dust pollution with 4 year annual maintenance to ensure the early survival. ● Development of new railway siding i.e Gauri deep siding which will effectively reduce road transportation to a great extant. ● Wind barrier along railway siding ● Rainguns along railway siding Above all, there is a provision of silo at Sasti expansion OC Project. Adoption of this mechanization will reduce the dust pollution to a great extent. The proposal has been approved by company's Board and report finalization is under pipeline stage and the construction is expected to be completed by March'2025. From the above it is evident that company is effortlessly working towards reducing the air pollution by implementing new and latest techniques in and around the project for the betterment of local people.	 Rs. 40 lakhs Rs. 26 lakhs Rs. 88 Lakhs Rs. 1.2 crores Rs.237 lakhs Rs. 45 lakhs Provision for Silo Rs.	 December 2023 March 2024 July 2023 July 2023 August 2023 September 2023 December 2023 March 2025

4)	We have demanded many times that health camps should be organized through Western Coal Fields Ltd. They conducted the medical camp once in a year. When we local people have to eat the dust of the company every day, so why health camp is not organized for us after certain period?.	Project Proponent said that masks and sanitizers have been distributed to schools during the COVID epidemic period under the CSR fund. In FY 2021-22, Financial assistance was given to to District Administration, Chandrapur.R.O. water facility has been provided in the villages of the area. Similarly, medical camps were organized at various places. At this time, Medical Officer of the Project Proponent said that we have provided medical facilities to 1,094 displaced people who have left their own villages. In the last five years, excluding the two-year of Covid period, around 4,000 people have been provided medical services in the respective villages. Similarly, if they have any other ailments, they are assured of free medical services at WCL hospital and asked to avail medical services. In other words, apart from displaced people, medical facilities are also provided to people in the surrounding villages. This year with the co-ordination of PHC (Primary Health Centre), Govt. of Maharashtra Katoli, we have organized women's family planning surgeries since January this year. From January till 16.03.2023, 40 women have undergone family planning surgery. They have been	In this regard, project proponent would like to state that WCL has its own Area Hospital to provide medical facilities to all local people. The hospital has 25 beds with a 24 hours causality, working OT, OPD (9am to 6pm) and 24 hours Inpatient department with separate male and female ward and isolation wards. The hospital has a total manpower of 94 employees consisting of SKILLED MANPOWER-46 & UNSKILLED MANPOWER -35 and CONTRACTUAL MANPOWER -13. The hospital is headed by Dr. Obaish Ali (AMO) under the leadership of Sri Sabyasachi De, Area General Manager, Ballarpur Area and consists of 08 Doctors (05 GDMOs currently working, 01 GDMO on childcare leave and 02 GDMOs on Study leave). FACILITIES AT AREA HOSPITAL, BALLARPUR AREA: ● 08 hrs OPD and 24 hrs airconditioned IPD and casualty with Pediatric OP ● COVID ward with central oxygen supply ● Outdoor pharmacy ● Injection room and dressing room ● Lab facility - blood and biochemical investigations ● ECG	Proposed CSR budget for (23-24) Rs. 89 lakhs Proposed Welfare Budget 23-24 Rs. 1685 Lakhs Expenditure details of CSR and Welfare budget attached as **Annexure 6**	Regular.

		given seven days of food and complete medical supervision. Our aim is to provide timely access to medical facilities to the people of the area. 2-3 days ago, after receiving information about the epidemic, a health camp has been organized in Pauni village and medical services have been provided to the local people. They have been assured to extend medical facilities on urgent basis if there is any sign of epidemic. Project Proponent said that the project affected villages and the surrounding people have been informed that 24 hours OPD and Area Hospital is open and needy person can avail medical services at any time.	• Spirometry & Audiometry • IME & PME in Occupational Health Centre • Female sterilization operation and hydrocele operations in our hospital in coordination with GOVT.PHC team • Hospital conducts regular screening camps - last 4 camps (Hb1ac, HIV/HbsAg, Bone scan, 2d echo etc.) • Radiological investigations (X-ray) • COVID antigen testing • COVID vaccination • Kitchen to provide food for the inpatients • Treatment for CSR patients OTHER ACTIVITIES AT AREA HOSPITAL, BALLARPUR AREA: - Vaccination Programs are regularly held according to the National Immunization Programs in coordination with govt PHC. - The health teams also go to nearby villages for health camps (under CSR activities). - Doctors do health awareness programs for employees at mines /VTC. CME programs are conducted regularly under Welfare activities to enlighten the patients and their families regarding various illness, addictions etc.		

- Health camps for screening of HIV, HbsAg, DM, Hb1ac, Bone densitometry and 2D echo are regularly conducted in coordination with empaneled hospitals.

- Hospital has spirometer, Audiometer and ECG machines with trained personal. Hospital authorities conduct regular training programs at WCL HRD dept and outside centers for employees/ doctors.

- During to the COVID Pandemic, covid antigen testing has been stated at Area Hospital.

- Covid Vaccination Program has also been started at Area Hospital.

- New equipment like Multiparas, 500 mA x ray, oxygen concentrators, suction apparatus etc have been installed.

- Pediatric specialist available for pediatric patients along with vaccinations as per National Immunization schedule.

STATUS OF EQUIPMENT'S IN AREA HOSPITAL, BALLARPUR AREA

S. no	Description	Quantity	Condition	Remark
1	X-Ray Machine 500 mA	1	Working	
2	Multipara	2	Working	
3	ECG Machine	2	Working	
4	Oxygen concentrators	4	Working	
5	Spirometer	1	Working	
6	Audiometer	1	Working	
7	Auto Analyzer	1	Working	

8	Fire Extinguisher	4	Working	Contracted to M/S Fire Services			
9	Autoclave	1	Working				
10	Suction Apparatus	1	Working				

WELFARE HEALTH CAMPS DONE AT BALLARPUR AREA IN FY 2022-23:

	Name of the camp	Location	Executed date	Beneficiaries
1	Blood Donation camp	Area Hospital	30.09.22	24
2	BMD camp	Area Hospital	22.10.22	75
3	Eye checkup camp	Area Hospital	29.10.22	129
4	General Health checkup plan	Ballarpur Dispensary	09.01.23	73

Detailed report of last 5 years in enclosed as **ANNEXURE 5**

Photos of Medical camps enclosed as **ANNEXURE 4:**

CSR HEALTH CAMPS DONE AT BALLARPUR AREA:

No	Name of the camp	Location	Date done	Beneficiaries
1	Osteoporosis camp	Gouri village	18.09.22	123
2	Cancer	Sasti	27.09.22	130

	screening camp	village		
3	Tubectomy operation camp	Khadoli PHC	09.12.22	09
4	General Health checkup camp	Kolgaon village	18.12.22	216
5	Tubectomy operation camp	Khadoli PHC	24.12.22	09
6	Tubectomy operation camp	Khadoli PHC	01.01.23	07
7	General Health checkup camp	Sakhri village	16.01.23	253
8	Tubectomy operation camp	Khadoli PHC	14.01.23	09
9	Tubectomy operation camp	Khadoli PHC	28.01.23	06

OCCUPATIONAL HEALTH CENTRE DATA OF AREA HOSPITAL, BALLARPUR AREA:

PME TARGET FOR THE YEAR-2022-23	PME DONE
TOTAL PME (WCL EMPLOYEES)	
ABOVE 45 Years	423
BELOW 45 Years	839
ABOVE 50 YEARS	699

ANNUAL PME OF 51-60 YRS. IN ACTIVE MINING WORK	693
PRE-RETIREMENT PME	145
STOOL EXAMINATION AND SPUTUM AFB for Employees engaged in FOOD HANDLING	17
CHEST X-RAY for employees engaged in FOOD HANDLING	17
EYE REFRACTION TEST for employees engaged in HEMM OPERATION	282
EYE REFRACTION TEST for employees engaged in DRIVING	32
PME OF EXECUTIVES	4
PME OF CONTRACTUAL EMPLOYEES	0

IME 2022-23	IME DONE
IME CONTRACTUAL	1028
IME WCL DEPENDENTS	40
IME WCL LAND OUSTEE	96
IME PGPT/PDPT	54
IME ITI APPRENTICE	9
IME M/S , SURVEYOR	26

			TOTALWCL IME DONE: 225 TOTAL IME DONE (WCL IME + CONTRACTUAL IME): 1253		
5)	Our water level has decreased due to heavy water consumption by the industry. A bore well has now been promised after many demands. However, the local people demand that Government should provide a separate water supply system to our village immediately.	Project Proponent said that we have implemented rain water harvesting schemes in the mine. However, wherever you need, bore wells will be provided. Project Officer further said that water storage system will be provided by constructing check dams in the area of Sasti Nala and Gauri Nala, due to which the water level of wells in the area will increase. Necessary measures will be taken up for providing drinking water based on your need.	Ground Water recharge Structure/ Rainwater Harvesting Three rooftop rainwater harvesting structure has been constructed at AGM office, and Sasti Guest House for groundwater recharge. Ground water level monitoring through bore well and well Water levels are monitored four times in a year. Ground water monitoring report attached as **ANNEXURE 7**. Regular monitoring of ground water level from existing wells is being done at various locations of buffer zone for four times a year i.e. during pre-monsoon (May), monsoon (August), post-monsoon (November), and winter (January) No impact was found on existing well ground water level in buffer zone from mining activities. Well water level was found in range between 2-10 m from ground level Feb' 2023. Audit was carried out by third party agency ICFRE, Dehradoon (Govt. research institute) from 20.02.2023 to 24.02.2023. Observations from draft report of audits says that No impact was found on existing well ground water level in buffer zone from mining activities. It is proposed to construct piezometer with DWLR for regular monitoring of ground water level in core zone.		

			Also the project has secured CGWA NOC from central Ground water Authority, for abstraction and utilization along with discharge of ground water. Attached as **ANNEXURE 8.** Water for usage of villages is made available through water tankers as and when demanded by nearby village authorities.		
6)	There is ban on Land-Piece / Tukada Bandi in the District. Tahsildar of the District took 4-5 lakhs from the farmers to declare it. Then why Western Coal Fields is not accepting it? We are 45-50 people and our matter is pending due to Land-Piece/Tukada Bandi issue. However, Project Proponent - Western Coal Fields should not oppose it, otherwise Sasti village will oppose for the act of Project Proponent.	Project Proponent answered in Hindi that the objections are raised here regarding ban on Land-Piece/Tukada Bandi. We have already made correspondence with our Head Quarters demanding detailed discussions on ban on Land Piece/Tukada Bandi. An early decision regarding calling of meeting will be made.	Land acquisition is done through proper procedure as per the rules laid out by Government. The mine is following the R&R policy of the CIL, 2012 for matters related to employment and resettlement. In this regard, company has formed an R&R Committee for sorting out the land employment and compensation related matters: In this regard, Project has ensured timely allotment of employment and compensation to the land effected villagers but sometimes delay has been observed due to agreement related issues. Either late submission by villagers or due to in non-compliance with the Company's policy/norms of Act. However, it has been requested to villagers to submit their land agreement timely to the Project Administration so that land related formalities and monetary compensation i.e R&R Benefit will be given to the eligible persons, at the earliest as per policy/norms.		

3) **Shri Lakhan Adbale, Residence – Golegaon, Taluka – Rajura, District – Chandrapur:-**

	Objection / Information / Question	**Answers / Assurances given by Project Promoter / Environmental Consultant / Environmental Public Hearing Committee as per discussion**	**Action Taken/ Status as on 15/06/2023**	**Budget Provision**	**Timeline for Completion**
1)	My statement to WCL Administration is that I have worked as Co-ordinator in Gauri project in 2003. My experience is what do the local people want and what does the company do? Company has acquired survey no.257 in 1983 for construction of railway line. Now, the management have planned to sell the remaining land to another private person. But the company is not providing detailed information regarding the plot to land user. If seller and buyer are ready for the deal, then detailed information regarding the plot should be made available to them. There is Training Centre at Wekoli, but there is no services available for the social development.	Project Officer said that Shri Lakhan Adbale has asked relevant question. He informed that the company has acquired plot in 1983. Now land is acquired for Sasti Expansion OC project. At that time,the WCL Administration said that if the plot/Land holders themselves are ready, then their problems should be known first, not TLR. The WCL Administration has sent a letter to all and informed about how much land has been taken and how much is left, the plot holders themselves are ready to give an affidavit.	Now land is acquired for Sasti Expansion OC project. At that time,the WCL Administration said that if the plot/Land holders themselves are ready, then their problems should be known first, not TLR. The WCL Administration has sent a letter to all and informed about how much land has been taken and how much is left, the plot holders themselves are ready to give an affidavit.		
2)	He further commented on land piece ban and asked how the	There are various pollution control	In this regard, project proponent would like to state that project is committed towards controlling air pollution		

	company demanded removal of land piece ban. Similarly, objection was raised as to why the WCL company is not taking measures regarding the pollution it causes. He said that there is a lot of pollution in the project-affected village. No action is being taken in this regard. It is harmful to humans, animals, and the universe. I worked in WCL for six years. Gauri's rehabilitation was delayed by ten years. At that time people suffered a lot, WCL officials misled the project victims and local people. Project officials does not convey the benefits of plot to the user. However, detailed information about the plot (here S.No. 257) should be provided.	measures are in place as on date and in future also pollution control measures will be enhanced as per approved Mining Plan/ EIA-EMP	in and around the project due to mining activity. All Pollution control measures are in place working effectively at Sasti OC Project. However project is committed towards the same by implementing new and latest techniques also (as per EIA/EMP) along with existing measures. **Details of the existing measures are given below:** ● 08 nos. of Fixed sprinklers provided at 100 MT weigh bridge. ● 06 nos. Fixed sprinklers provided at CHP. ● 04 nos.Fixed sprinklers along coal transportation road. ● Water spraying arrangement provided at mobile crusher. ● 11 nos. of rain guns installed at coal stockyard. ● Mobile crusher is covered with side cladding (CGI sheet) along with sprinklers to control dust pollution. ● Conveyor belt of mini CHP and main CHP are covered with CGI sheet. ● Presently 05 Nos. of Mobile Water Tankers are provided for dust suppression (Hired-1 no. of 04 KL, Departmental – 2 no. of 28KL and HoE Contractor tanker of 28 KL each) ● 01 no of hired road sweeping machine provided on coal transportation road. ● Brooming and maintenance of coal transport road and weigh bridge road is done regularly ● Unloading point of CHP is equipped with mist spray sprinkling system. Receiving point and conveyor belt is fully enclosed. Fixed sprinkler is also installed at coal discharge point. ● 01 no of Sedimentation tank for treatment of mine discharged water ● 01 no of ETP of capacity 75 KL/day		

			• Black topped road to control dust pollution. In this regard, company has recently ensured the NoC from PWD and developed the Black topped road of 1.8 km.) • Tarring of 06.00 km length of internal roads used by Coal Transportation trucks. • Coal carrying Trucks are covered with Tarpaulin and same is ensured by CCTV cameras installed at exit points. • Plantation of 169.15 Ha has been already done by FDCM and MPRVVN, to control dust pollution and to improve the aesthetic value of surroundings.(Photos enclosed) • Air quality Monitoring is carried out by CMPDIL fortnightly and it is evident that all values are well within the permissible limit. (Graphical representation of last 3 Years data is enclosed as **Annexure 3).** • Regular Inspections are done by environment officers and company and Maharashtra Pollution control Board time to time and it has been found that most of the control measure are in regular operation with some exceptions of breakdown. Photos of above stated measures has been enclosed as **Annexure 4** **Future proposals under pipeline:**		
			• 1 no of Tyre washing system will be in operation to control dust pollution. • 5 nos. of Trolley mounted fogger system to control dust pollution • 1 no. of CAAQMS system to monitor air quality 24*7 in and around the project. • Plantation in an area of 47 Ha in and around the	Rs. 40 lakhs Rs. 26 lakhs Rs. 88 Lakhs Rs. 1.2	December 2023 March 2024 July 2023 July 2023

			project to control dust pollution with 4 year annual maintenance to ensure the early survival. ● Development of new railway siding i.e Gauri deep siding which will effectively reduce road transportation to a a great extant. ● Wind barrier along railway siding ● Rainguns along railway siding Above all, there is a provision of silo at Sasti expansion OC Project. Adoption of this mechanization will reduce the dust pollution to a great extant. Same has been approved by company's Board. and report finalization is under pipeline stage, and it is expected that it will be completed by march 2025. From the above it is evident that company is effortlessly working towards reducing the air pollution by implementing new and latest techniques in and around the project for the betterment of local people. Further, in respect to Land acquisition and R&R it is done through proper procedure as per the rules laid out by Government. The mine is following the R&R policy of the CIL, 2012 for matters related to employment and resettlement. In this regard, company has formed an R&R Committee for sorting out the land employment and compensation related matters. Copy of R&R Policy is enclosed as **ANNEXURE 9.** (Same is available at office as well as WCL and Coal India website for ready reference)	crores Rs.237 lakhs Rs. 45 lakhs	August 2023 September 2023 December 2023 March 2025

At that time, Chairman, Environment Public Hearing Committee said that relevant questions should be asked so that the Project Proponent can answer them.

Here Shri Lakhan Adbale informed that WCL has not issued any notice to plot users. He suggested that the notice should be sent to him on the name of his father.

4) Shri Prakash Bhatarkar, Residence – Sasti village, Taluka – Rajura, District – Chandrapur :-

Sr. No.	Objection / Information / Question	Answers / Assurances given by Project Promoter / Environmental Consultant / Environmental Public Hearing Committee as per discussion	Action Taken/ Status as on 15/06/2023	Budget Provision	Timeline for Completion
1)	Here an Environmental Public Hearing is going on for the area expansion of the new Sasti open cast mine. Old Sasti open cast mining is going on. Dhupatala open cast mine is going on and underground Sasti mine is going on. After the opening of the new Dhupatala Open Cast Mine, a large stock of coal was placed near the village. The pollution in Sasti village has increased so much that many people are suffering from diseases like cough, cold and asthma. They do not spray water on the coal, road. Pollution has increased. Lands of 814 people	Project Officer remarked that Shri Prakash Bhatarkar asked a good question. Project Officer while informing steps to prevent dust pollution said that water sprinkling system is provided to spray water on coal stock. Also fire fighting system is also provided. Within one year, total coal stock will go inside of road by nearly one kilometer. Wind Barriers are already installed near the coal stock.	Project proponent wants to highlight the fact that after the operation of new Sasti Expansion OC Project, there will be no increase in coal dust pollution considering the fact there will be no increase in production, this public hearing is only for expansion of area, keeping the production same as earlier i.e Peak 2.5 MTPA. Further, project proponent would like to state that project is committed towards controlling air pollution in and around the project due to mining activity. All Pollution control measures are in place working effectively at Sasti OC Project. However, project is committed towards the same by implementing new and latest techniques also (as per EIA/EMP) along with existing measures. In relation to coal stock yard of DhoptalaOC, Project has already constructed wind barrier to minimize dust pollution.		

	were acquired while starting the new Dhuptala Open Cast mine. 872.26 hectares of land was acquired. The section has been implemented since 2012 and friendly negotiations has been started in 2022-2023.	Water system is also provided. Hence, there will be no trouble. The total plan of rehabilitation of Sasti village is ready and it is attached with project report. It will be submitted to Gram Sabha. For redressal of the issue raised, the frequency of mobile water tankers for dust suppression at the said places will be increase immediately.	**Details of the existing measures are given below:** ● 08 nos. of Fixed sprinklers provided at 100 MT weigh bridge. ● 06 nos. Fixed sprinklers provided at CHP. ● 04- Fixed sprinklers along coal transportation road. ● Water spraying arrangement provided at mobile crusher. ● 11 nos. of rain guns installed at coal stockyard. ● Mobile crusher is covered with side cladding (CGI sheet) along with sprinklers to control dust pollution. ● Conveyor belt of mini CHP and main CHP are covered with CGI sheet. ● Presently 05 Nos. of Mobile Water Tankers are provided for dust suppression (Hired-1 no. of 04 KL, Departmental – 2 no. of 28KL and HoE Contractor tanker of 28 KL each) ● 01 no of hired road sweeping machine provided on coal transportation road. ● Brooming and maintenance of coal transport road and weigh bridge road is done regularly ● Unloading point of CHP is equipped with mist spray sprinkling system. Receiving point and conveyor belt is fully enclosed. Fixed sprinkler is also installed at coal discharge point. ● 01 no of Sedimentation tank for treatment of mine discharged water ● 01 no of ETP of capacity 75 KL/day ● Black topped road to control dust pollution. In this regard, company has recently ensured the NoC from PWD and developed the Black topped road of 1.8 km.) ● Tarring of 06.00 km length of internal roads		

			used by Coal Transportation trucks. ● Coal carrying Trucks are covered with Tarpaulin and same is ensured by CCTV cameras installed at exit points. ● Plantation of 169.15 Ha has been already done by FDCM and MPRVVN, to control dust pollution and to improve the aesthetic value of surroundings.(Photos enclosed) ● Air quality Monitoring is carried out by CMPDIL fortnightly and it is evident that all values are well within the permissible limit. (Graphical representation of last 3 Years data is enclosed as Annexure 3). ● Regular Inspections are done by environment officers and company and Maharashtra Pollution control Board time to time and it has been found that most of the control measure are in regular operation with some exceptions of breakdown. Photos of above stated measures has been enclosed as Annexure 4 **Future proposals under pipeline:** ● 1 no of Tyre washing system will be in operation to control dust pollution. ● 5 nos. of Trolley mounted fogger system to control dust pollution ● 1 no. of CAAQMS system to monitor air quality 24*7 in and around the project. ● Plantation in an area of 47 Ha in and around the project to control dust pollution with 4 year annual maintenance to ensure the early survival. ● Development of new railway siding i.e Gauri deep siding which will effectively reduce road transportation to a great extant. ● Wind barrier along railway siding	Rs. 40 lakhs Rs. 26 lakhs Rs. 88 Lakhs Rs. 1.2 crores Rs.237	December 2023 March 2024 July 2023 July 2023 August 2023 September

			• Rainguns along railway siding Above all, there is a provision of silo at Sasti expansion OC Project. Adoption of this mechanization will reduce the dust pollution to a great extant. Same has been approved by company's Board. and report finalization is under pipeline stage and it is expected that it will be completed by march 2025. From the above it is evident that company is effortlessly working towards reducing the air pollution by implementing new and latest techniques in and around the project for the betterment of local people.	lakhs Rs. 45 lakhs	2023 December 2023 March 2025
2)	My land is also acquired by WCL. The 7/12 extract from 1995-1996 was on my father's and then mother's name. The section started in 2012 and the grant/compensation was received in 2015. After mother's death in 2018, we three brothers nominated as heirs. Now WCL says that since both 7/12 have the same name, only one of us will get the job. Hence, take both 7/12 make a deal and take a job. Now WCL says that only one person from the family can be given job. This is unfair to us. I am requesting Project Administration and District Collector to consider our two 7/12 and give us two jobs.	Project Proponent further stated that our company's policy is that if farmer's name is on one gut number and same name is on another gut number, then it is considered as one group. Also, if a farmer owns land in different areas, it is treated as "Single Holding." Shri Prakash Bhatarkar got the plot from one heir, so only one of the three brothers can be given a job, but efforts will be made to give justice to him after discussing this with the top management of the	In this regard, Project Proponent would like to mention that as per Government norms and company's land acquisition and R&R policy if farmer's name is on one gut number and same name is on another gut number, then same will be considered as one group only. Also, if a farmer owns land in different areas, it is treated as "Single Holding." Shri Prakash Bhatarkar got the plot from one heir, so only one of the three brothers can be given a job as per norms and policy. However, all the grievances of the land outsees are being dealt with. Grievance Redressal Committee which is formed at the district level to sort out the issues of the land outsees as per the CBA, 1957 with the following members: 1. District Collector- Chairman 2. MP/ Representative of MP- Member 3. MLA/ Representative of MLA- Member		

		company.	4. Chairman, Panchayat Samitee- Member 5. Sub- Divisional Revenue Officer/ Sub- Divisional Magistrate- Member 6. Area General Manager, Ballarpur Area There is also an online platform available to the citizens 24x7 to lodge their grievances to the public authorities through website named as Centralized Public Grievance Redress and Monitoring System (CPGRAMS).		

5) Shri Satish Bangar, Dhuptala Project, Taluka – Rajura, District – Chandrapur :-

Sr. No.	Objection / Information / Question	Answers / Assurances given by Project Promoter / Environmental Consultant / Environmental Public Hearing Committee as per discussion	Action Taken/ Status as on 15/06/2023	Budget Provision	Timeline for Completion
1)	We have to learn from this company how to cheat the farmers. Dhoptala project started in 2012. In 2015, Section 9 came into effect. But the allocation of money was done in 2021-22. Company says that the farmers have divided the farm into two parts, hence it falls under the ban on land piece/Tukada Bandi.	Project Proponent said that the points raised by Mr. Satish Bangar are correct. Dhopatala project was sectioned in 2012. It became Section 9 in 2015. Talking about ban on land-piece means Maharashtra Government has passed the said rule	Land acquisition is done through proper procedure as per the rules laid out by Government. The mine is following the R&R policy of the CIL, 2012 for matters related to employment and resettlement. In this regard, company has formed an R&R Committee for sorting out the land employment and compensation related matters: In this regard, Project has ensured timely allotment of employment and compensation to the land effected		

	Some people have 70R, 75R, 78R. Some have 82R. The company has also planned to mix 70Rs with 82Rs. Everything should be as the company says. Company attaches the section, company pays the compensation and company itself goes to Court. Company themselves have filed the Petition and says that as per message from Head Quarters, we are filing the case. Company officials filed petition against the 95 poor PAPs. Company has filed petition against 11 PAPs also. Company says that as matter is sub-judice, they will not give jobs upto the judgement of the Court. When the order came from Tahsildar, Company Administration says that the Order was obtained by paying five hundred rupees to the local people. Company could have told at that time i.e. 2015 that as you are part of the ban on land piece/Tukada Bandi, so they will not give you a job. Case is filed in court by the company only, not by the local people. However, justice should be given in this matter. Otherwise, on 18th, all Dhuptala's agitation will be carried. Shri Satish Bankar while raising objections remarked that in 2015 only, the company's duty was to	and banned land piece.	villagers but sometimes delay has been observed due to agreement related issues. Either late submission by villagers or due to in non-compliance with the Company's policy/norms of Act. However, it has been requested to villagers to submit their land agreement timely to the Project Administration so that land related formalities and monetary compensation i.e R&R Benefit will be given to the eligible persons, at the earliest as per policy/norms.		

	create awareness among the local people about ban on land piece/tukada bandi. We also know that there is a Joining of Land Piece Law, similar to the ban on land piece. Prior to Dhuptala, the company has given jobs in Sasti Open Cast Mine to 67 persons who falls under ban on land piece. One taluka, one district, one company's administration and rules should also be the same.				

6) Shri Sunil Urkude, Member, Zilla Parishad – Chandrapur:

Sr. No	Objection / Information / Question	Answers / Assurances given by Project Promoter / Environmental Consultant / Environmental Public Hearing Committee as per discussion	Action Taken/ Status as on 15/06/2023	Budget Provision	Timeline for Completion
1)	Although, Chairman, Environment Public Hearing Committee said that ban of land piece/Tukada Bandi , is not the topics of this meeting, but the participants have asked questions on the same topic as it is burning issue. Shri Sunil Urgude while registering objection said that as presented in the meeting, there should not be one	Project Proponent said that Shri Sunil Urgade has registered an objection regarding irrigated land. For this, a discussion has been held with the headquarters and a local committee will be formed in this regard. For this, the evidence of	Land acquisition is done through proper procedure as per the rules laid out by Government. The mine is following the R&R policy of the CIL, 2012 for matters related to employment and resettlement. In this regard, company has formed an R&R Committee for sorting out the land employment and compensation related matters: In this regard, Project has ensured timely allotment of employment and compensation to the land effected	Rs. 42 crores as land compensation.	By end of August 2023.

	rule for one mine and another rule for another mine. WCL did not need to go to court. However, the company should withdraw from the court. Local farmers here have done regularization by spending 5-6 lakhs as told by WCL officials. Legal Wing of WCL should take a decision and remove the injustice being done to the local farmers as soon as possible. Now to talk about this mine, previously the handwritten extract of 7/12 is to prepared at Revenue Department. That time land was irrigated. While preparing the 7/12 online, some officials have forgotten to write irrigated land or bore well in the agriculture fields. So, now WCL says that if there is proof of 3-4 years ago of irrigated land, light bill of ten years old, if there is proof of tube well, if that land is irrigated in 2019, such farmers should be paid 10 lakh rupees as cost of irrigated land. For this WCL should discuss with the higher management and find a solution.	the land being irrigated for at least three years or earlier will be investigated. If it is irrigated, it will be remunerated accordingly. It is also requested that we enter into an agreement with the company accordingly.	villagers but sometimes delay has been observed due to agreement related issues. Either late submission by villagers or due to in non compliance with the Company's policy/norms of Act. However, it has been requested to villagers to submit their land agreement timely to the Project Administration so that land related formalities and monetary compensation I.e R&R Benefit will be given to the eligible persons, at the earliest as per policy/norms.		

2)	Land acquisition under Land Acquisition Act is going on in Sasti, Ballarpur, Gauri, Pauni. The farmer here has not gone to WCL, but WCL has come to take land from the farmers. Also, WCL should stop acquiring land in one place and giving jobs elsewhere. However, along with the location here, jobs should be made available in nearby Ballarpur and Chandrapur area. Not only the farmers depend on agriculture, but also the poor farm laborers living in the villages. Along with farmers, farm laborers also need to be included in the contract system	Project Proponent said that while providing jobs to the project victims, we will provide them here in this area only, i.e. Chandrapur, Wani. This has been discussed. If Ballarpur requires manpower, preference will be given to local people.	In this regard Project Proponent has committed that while providing jobs to the project victims, preference will be given to local people when there will be requirement of manpower in Ballarpur Area or nearby area.		
3)	Shri Sunil Urkade suggested to make more efforts to protect the environment. Efforts should be	Project Proponent said that a collective scheme for the rehabilitation of	Project proponent wants to highlight the fact that after the operation of new Sasti Expansion OC Project, there will be no increase in coal dust pollution considering		

	made to avoid pollution. You are advised to spend the CER funds you have to spent on environment	the villages has been prepared for Sasti, Pauni and other villages and the work will be completed in collaboration with local NGOs. He said that the public hearing is going on for Sasti mine and the mine is operational and its area will be increased. Funds are ready for the land to be acquired. So we should make an agreement as soon as possible. However, we want this mine to start immediately following due procedures of law of land.	the fact there will be no increase in production, this public hearing is only for expansion of area, keeping the production same as earlier I.e Peak 2.5 MTPA. Further, project proponent would like to state that project is committed towards controlling air pollution in and around the project due to mining activity. All Pollution control measures are in place working effectively at Sasti OC Project. However project is committed towards the same by implementing new and latest techniques also (as per EIA/EMP) along with existing measures. In relation to coal stock yard of DhoptalaOC, Project has already constructed wind barrier to minimize dust pollution. **Details of the existing measures are given below:** ● 08 nos. of Fixed sprinklers provided at 100 MT weigh bridge. ● 06 nos. Fixed sprinklers provided at CHP. ● 04- Fixed sprinklers along coal transportation road. ● Water spraying arrangement provided at mobile crusher. ● 11 nos. of rain guns installed at coal stockyard. ● Mobile crusher is covered with side cladding (CGI sheet) along with sprinklers to control dust pollution. ● Conveyor belt of mini CHP and main CHP are covered with CGI sheet. ● Presently 05 Nos. of Mobile Water Tankers are provided for dust suppression (Hired-1 no. of 04 KL, Departmental – 2 no. of 28KL and HoE Contractor tanker of 28 KL each) ● 01 no of hired road sweeping machine provided on coal transportation road.		

			• Brooming and maintenance of coal transport road and weigh bridge road is done regularly • Unloading point of CHP is equipped with mist spray sprinkling system. Receiving point and conveyor belt is fully enclosed. Fixed sprinkler is also installed at coal discharge point. • 01 no of Sedimentation tank for treatment of mine discharged water • 01 no of ETP of capacity 75 KL/day • Black topped road to control dust pollution. In this regard, company has recently ensured the NoC from PWD and developed the Black topped road of 1.8 km.) • Tarring of 06.00 km length of internal roads used by Coal Transportation trucks. • Coal carrying Trucks are covered with Tarpaulin and same is ensured by CCTV cameras installed at exit points. • Plantation of around __ Ha has been already done by FDCM and MPRVVN, to control dust pollution and to improve the aesthetic value of surroundings.(Photos enclosed) • Air quality Monitoring is carried out by CMPDIL fortnightly and it is evident that all values are well within the permissible limit. • Regular Inspections are done by environment officers and company and Maharashtra Pollution control Board time to time and it has been found that most of the control measure are in regular operation with some exceptions of breakdown. Photos of above stated measures has been enclosed as **Annexure 4** **Future proposals under pipeline:** • 1 no of Tyre washing system will be in	Rs. 40	December

			operation to control dust pollution. ● 5 nos. of Trolley mounted fogger system to control dust pollution ● 1 no. of CAAQMS system to monitor air quality 24*7 in and around the project. ● Plantation in an area of 47 Ha in and around the project to control dust pollution with 4 year annual maintenance to ensure the early survival. ● Development of new railway siding i.e Gauri deep siding which will effectively reduce road transportation to a great extant. ● Wind barrier along railway siding ● Rainguns along railway siding Above all, there is a provision of silo at Sasti expansion OC Project. Adoption of this mechanization will reduce the dust pollution to a great extant. Same has been approved by company's Board. and report finalization is under pipeline stage and it is expected that it will be completed by march 2025. From the above it is evident that company is effortlessly working towards reducing the air pollution by implementing new and latest techniques in and around the project for the betterment of local people.	lakhs Rs. 26 lakhs Rs. 88 Lakhs Rs. 1.2 crores Rs.237 lakhs Rs. 45 lakhs	2023 March 2024 July 2023 July 2023 August 2023 September 2023 December 2023 March 2025
4)	WCL always shows a separate road for coal transportation while starting the mine, but the public road is used instead of developing a separate road. Without the capacity of that road, the traffic of overloaded trucks continues day and night. So the condition of the	Project Officer said that Shri Urgade has registered an objection regarding the company's transport on public roads. The transportation of trucks in the company will be stopped in one month.	Black topped road to control dust pollution. In this regard, company has recently ensured the NoC from PWD and developed the Black topped road of 1.8 km. ● Development of new railway siding i.e Gauri deep siding which will effectively reduce road transportation to a great extant. there is a provision of silo at Sasti expansion OC		

	road has become miserable.	A Silo is coming up in the Sasti project. It will have a capacity of ten million. In the next two years, the company will not carry coal from public roads. All the necessary provisions have been made in approved Mining Plan/ EIA-EMP. The same will be implemented by Project Proponent	Project. Adoption of this mechanization will reduce the dust pollution to a great extant. Same has been approved by company's Board. and report finalization is under pipeline stage and it is expected that it willl be completed by march 2025. • Tarring of 06.00 km length of internal roads used by Coal Transportation trucks. • Coal carrying Trucks are covered with Tarpaulin and same is ensured by CCTV cameras installed at exit points. Also, it is ensured that there will be no overloading of truck.		

7) Shri Bhaskar Chaoudhary, Residence – Sasti, Taluka – Rajura, District – Chandrapur:-

Sr. No.	Objection / Information / Question	Answers / Assurances given by Project Promoter / Environmental Consultant / Environmental Public Hearing Committee as per discussion	Action Taken/ Status as on 15/06/2023	Budget Provision	Timeline for Completion
	Sasti village is surrounded by mines. Due to the soil that is being dumped, dust is spread all over Sasti village. It is affecting children, young children and the elder persons. So much dust flies that if you clean the utensils in the morning, there is a layer of dust on them in the evening. Land was acquired at Sasti and Dhopatala. But some land have not been acquired in between Sasti and Dhopatala and it is just left out. We villagers cannot do anything on that land, there is no habitation, no water. Secondly, the soil from the mines is dumped there. We cannot grow crop there. This is our present status.	Project officials said that Shri Bhaskar Chaudhary lives in village Sasti and his land is in village Sasti. He informed about the problem due to dust in the project. Project Officer informed that the rehabilitation of Sasti village will be done and a plan has been prepared for it. Project Officer further said that Shri Bhaskar Chaudhary raised the issue of vacant land in two villages. So this point will be kept in mind and it will be definitely considered at the next stage. We have prepared a road to reach the plot. Trench cutting has been done to prevent soil erosion during monsoon. However, the	Project proponent wants to highlight the fact that after the operation of new Sasti Expansion OC Project, there will be no increase in coal dust pollution considering the fact there will be no increase in production, this public hearing is only for expansion of area, keeping the production same as earlier I.e Peak 2.5 MTPA. Further, project proponent would like to state that project is committed towards controlling air pollution in and around the project due to mining activity. All Pollution control measures are in place working effectively at Sasti OC Project. However project is committed towards the same by implementing new and latest techniques also (as per EIA/EMP) along with existing measures. In relation to coal stock yard of DhoptalaOC, Project has already constructed wind barrier to minimize dust pollution. **Details of the existing measures are given below:** ● 08 nos. of Fixed sprinklers provided at 100 MT weighbridge ● 06 nos. Fixed sprinklers provided at CHP. ● 04- Fixed sprinklers along coal transportation road.		

		village will be surveyed and the necessary social facilities will be provided.	• Water spraying arrangement provided at mobile crusher. • 11 nos. of rain guns installed at coal stockyard. • Mobile crusher is covered with side cladding (CGI sheet) along with sprinklers to control dust pollution. • Conveyor belt of mini CHP and main CHP are covered with CGI sheet. • Presently 05 Nos. of Mobile Water Tankers are provided for dust suppression (Hired-1 no. of 04 KL, Departmental – 2 no. of 28KL and HoE Contractor tanker of 28 KL each) • 01 no of hired road sweeping machine provided on coal transportation road. • Brooming and maintenance of coal transport road and weigh bridge road is done regularly • Unloading point of CHP is equipped with mist spray sprinkling system. Receiving point and conveyor belt is fully enclosed. Fixed sprinkler is also installed at coal discharge point. • 01 no of Sedimentation tank for treatment of mine discharged water • 01 no of ETP of capacity 75 KL/day • Black topped road to control dust pollution. In this regard, company has recently ensured the NoC from PWD and developed the Black topped road of 1.8 km.) • Tarring of 06.00 km length of internal roads used by Coal Transportation trucks. • Coal carrying Trucks are covered with Tarpaulin and same is ensured by CCTV cameras installed at exit points. • Plantation of around __ Ha has been already done by FDCM and MPRVVN, to control dust pollution and to improve the aesthetic value of surroundings.		

			• Air quality Monitoring is carried out by CMPDIL fortnightly and it is evident that all values are well within the permissible limit. • Regular Inspections are done by environment officers and company and Maharashtra Pollution control Board time to time and it has been found that most of the control measure are in regular operation with some exceptions of breakdown. • Photos of above stated measures has been enclosed as **Annexure 4**		
			Future proposals under pipeline: • 1 no of Tyre washing system will be in operation to control dust pollution. • 5 nos. of Trolley mounted fogger system to control dust pollution • 1 no. of CAAQMS system to monitor air quality 24*7 in and around the project. • Plantation in an area of 47 Ha in and around the project to control dust pollution with 4 year annual maintenance to ensure the early survival. • Development of new railway siding i.e Gauri deep siding which will effectively reduce road transportation to a great extant. • Wind barrier along railway siding • Rainguns along railway siding Above all, there is a provision of silo at Sasti expansion OC Project. Adoption of this mechanization will reduce the dust pollution to a great extant. Same has been approved by company's Board. and report finalization is under pipeline stage and it is expected that it willl be completed by march 2025. Also, in the coming expansion project, technology	Rs. 40 lakhs Rs. 26 lakhs Rs. 88 Lakhs Rs. 1.2 crores Rs.237 lakhs Rs. 45 lakhs	December 2023 March 2024 July 2023 July 2023 August 2023 September 2023 December 2023 March 2025

adopted will be surface miner in blasting. Hence there will no dust pollution and vibration related issue in and around the project.

And with respect to dumping of top Soil or OB, it should be kindly noted that dumping takes place at only designated place/dump in only project area, which is clearly as per mining plan. To assure the same, regular inspections of DGMS is carried out project.

Present details of dump at Project:

There are 5 nos. of external OB dumps, 2 nos of Tops soil dumps, embankment and internal dump.

Details of OB Dumps:

External Dumps	Active/Inactive	Area (Ha)	Volume of OB (MCum)	Height (m)
External dump no. 1(Hard strata)	**Inactive**	**7**	**3.9**	**17**
External dump no. 2(Hard strata)	**Inactive**	**27.94**	**5.95**	**35**
External dump no. 3(Hard strata)	**Inactive**	**72.85**	**14.77**	**17.5**
External dump	**Inactive**	**16.52**	**2.5**	**15.1**

no. 4(Hard strata)					
External dump no. 5(Hard strata)	Inactive	40	17.26	40.45	
Embankment (Hard strata)	Inactive	32.72	2.62	8	
BC Soil Dump-A	Inactive	15.75	4.69	29.8	
BC soil dump-B	Inactive	21.25	4.1	19.31	

Details of Internal OB dump:

Internal/ Backfilled Dumps	Active/ Inactive	Area in Ha	Volume of OB (MCum)	Height from surface/ OGL (m)
Internal dump no.1 (Hard Strata)	Partially Active dump	245.06	179.27	60

Details of Top soil:

Top Soil	Quantity

			1) Total Topsoil as per plan Details not available **2) Topsoil extracted since inception** 8.796 MM3 **3) Topsoil removed in last six months** 0.57 MM3 (April 2022 to Sept'2022) **4) Topsoil utilized last six months** Nil **5) Top soil stacked for future use (present top soil quantity)** 8.796 MM3 (BC Soil dump no. A and B)		
2)	Hence, the Government and W.C. L. is requested that this village should be rehabilitated. The rest of the land should be acquired by the company immediately. All the dust is spreading in the village and it is destroying the remaining agriculture land. The environment of remaining village is being destroyed. However, Sasti village should be rehabilitated immediately.	Project Officer remarked that Shri Bhaskar Chaudhary expressed concern about the environment in Sasti village. Project officer answered that the dust that will be generated in Sasti Open Cast will not come out, it will remain inside. Also water is sprinkled on the dust through sprinklers. For this, there are mobile tankers and 35 sprinklers. We are trying to keep the dust from flying. Also, according to the new method, there will be no blasting while extracting	Project proponent wants to highlight the fact that after the operation of new Sasti Expansion OC Project, there will be no increase in coal dust pollution considering the fact there will be no increase in production, this public hearing is only for expansion of area, keeping the production same as earlier I.e Peak 2.5 MTPA. Further, project proponent would like to state that project is committed towards controlling air pollution in and around the project due to mining activity. All Pollution control measures are in place working effectively at Sasti OC Project. However project is committed towards the same by implementing new and latest techniques also (as per EIA/EMP) along with existing measures. In relation to coal stock yard of DhoptalaOC, Project has already constructed wind barrier to minimize dust pollution. **Details of the existing measures are given below:**		

		coal. So, there will be no dust and pollution. OCMS is going to be implemented in the project and tender method is being adopted for it	• 08 nos. of Fixed sprinklers provided at 100 MT weigh bridge. • 06 nos. Fixed sprinklers provided at CHP. • 04- Fixed sprinklers along coal transportation road. • Water spraying arrangement provided at mobile crusher. • 11 nos. of rain guns installed at coal stockyard. • Mobile crusher is covered with side cladding (CGI sheet) along with sprinklers to control dust pollution. • Conveyor belt of mini CHP and main CHP are covered with CGI sheet. • Presently 05 Nos. of Mobile Water Tankers are provided for dust suppression (Hired-1 no. of 04 KL, Departmental – 2 no. of 28KL and HoE Contractor tanker of 28 KL each) • 01 no of hired road sweeping machine provided on coal transportation road. • Brooming and maintenance of coal transport road and weigh bridge road is done regularly • Unloading point of CHP is equipped with mist spray sprinkling system. Receiving point and conveyor belt is fully enclosed. Fixed sprinkler is also installed at coal discharge point. • 01 no of Sedimentation tank for treatment of mine discharged water • 01 no of ETP of capacity 75 KL/day • Black topped road to control dust pollution. In this regard, company has recently ensured the NoC from PWD and developed the Black topped road of 1.8 km.) • Tarring of 06.00 km length of internal roads used by Coal Transportation trucks. • Coal carrying Trucks are covered with Tarpaulin and same is ensured by CCTV		

			cameras installed at exit points. ● Plantation of around __ Ha has been already done by FDCM and MPRVVN, to control dust pollution and to improve the aesthetic value of surroundings. ● Air quality Monitoring is carried out by CMPDIL fortnightly and it is evident that all values are well within the permissible limit. ● Regular Inspections are done by environment officers and company and Maharashtra Pollution control Board time to time and it has been found that most of the control measure are in regular operation with some exceptions of breakdown. **Future proposals under pipeline:** ● 1 no of Tyre washing system will be in operation to control dust pollution. ● 5 nos. of Trolley mounted fogger system to control dust pollution ● 1 no. of CAAQMS system to monitor air quality 24*7 in and around the project. ● Plantation in an area of 47 Ha in and around the project to control dust pollution with 4 year annual maintenance to ensure the early survival. ● Development of new railway siding i.e Gauri deep siding which will effectively reduce road transportation to a great extant. Above all, there is a provision of silo at Sasti expansion OC Project. Adoption of this mechanization will reduce the dust pollution to a great extant. Same has been approved by company's Board. and report finalization is under pipeline stage and it is expected that it willl be completed by march 2025.		

			From the above it is evident that company is effortlessly working towards reducing the air pollution by implementing new and latest techniques in and around the project for the betterment of local people. With respect to Rehabilitation process, company is committed towards timely implementation of policy and norms of R&R for the betterment of villagers /land affected people. Land acquisition is done through proper procedure as per the rules laid out by Government. The mine is following the R&R policy of the CIL, 2012 for matters related to employment and resettlement. In this regard, company has formed an R&R Committee for sorting out the land employment and compensation related matters: In this regard, Project has ensured timely allotment of employment and compensation to the land effected villagers but sometimes delay has been observed due to agreement related issues. Either late submission by villagers or due to in non-compliance with the Company's policy/norms of Act. However, it has been requested to villagers to submit their land agreement timely to the Project Administration so that land related formalities and monetary compensation I.e R&R Benefit will be given to the eligible persons, at the earliest as per policy/norms.		
		Environment officials said that for 2023-24, we will plant 1,17,000 trees. For redressal of the issue	Plantation covering an area of 169.15 ha has been raised with a total 5,15,500 Nos. of saplings in existing Sasti OC Mine, till 2014. (Plates 1, 3 and 4). Species planted includes Shisham (Dalbergia sissoo), Teak (Tectona gradis), Bamboo, Siwan (Madhuca		

		raised, the frequency of mobile water tankers for dust suppression at the said places will be increase immediately.	longifolia), Neem (Azadirachta indica), Peepal (Ficus religiosa), Subabool (Leucaena leucocephala), Bija (Pterocarpus marsupium) , Nilgiri (Eucalyptus sp.), Gulmohar (Delonix regia), Karanj (Pongamia pinnata), Imli (Tamarindus indica), Amla (Phyllanthus emblica), Quickstick (Glircidia sepium), etc. As per the plantation report, a total of 169.15 ha has been planted with 5,15,500 tree saplings, which include 88.22 ha plantation in external OB dumps and embankment, 20.75 ha plantation on internal backfilled dumps, 1.1 ha avenue plantation and 59.08 ha safety zone/greenbelt plantation.		

Site/location	Area (ha)	No of Trees Planted
Plantation on External OB dumps (including embankment)	88.22	286950
Plantation on Internal backfilled OB Dump	20.75	51875
Plantation on Waste lands/ Barren/ degraded lands	--	--
Avenue (transport/service roads) plantation	1.1	4000
Safety zone/greenbelt plantation	59.08	172675
Plantation around silo, coal stack yard, infrastructure, etc.	--	--
Total	169.15	5,15,500

In addition to the same, in FY 2023-24 target plantation is 117500 nos over an area of 47 Ha, covering mines under the control of Ballarpur Area. This plantation will carried out by MPRVVN Ltd.

At this time, some of the participants shouted that Project Officers are just promising – Hum Karenge, but they will not do anything.

Convener, Environment Public Hearing Committee informed Project Proponent that those present at the meeting agitated that pollution has made it impossible to live in their village. Hence, it has been suggested to give information about what measures will be taken immediately for that.

Sr. No.	Objection / Information / Question	Answers / Assurances given by Project Promoter / Environmental Consultant / Environmental Public Hearing Committee as per discussion	Action Taken/ Status as on 15/06/2023	Budget Provision	Timeline for Completion
A)	**Pollution control measures regarding**	At that time, the Project Officer while explaining about the Sasti Open Cast said that the Sasti Open Cast has been operational for many years due to your co-operation. Now, when there is mining activities, there will be problems of water and air pollution. So, our important task is to control this pollution. If the need arises, the pollution control system is also upgraded, and if there is need, the project is also upgraded. Our aim is to produce 2.5 million tonnes of coal per annum for several years. We have obtained Environmental Clearance	Project proponent would like to state that project is committed towards controlling air pollution in and around the project due to mining activity. All Pollution control measures are in place working effectively at Sasti OC Project. However project is committed towards the same by implementing new and latest techniques also (as per EIA/EMP) along with existing measures. **Dust pollution control measures are as follows:** ● 18 no of sprinklers are provided along internal roads, approach road to weighbridge and Main CHP. ● Water sprays nozzles arrangement on conveyor belt, loading & unloading point of CHP. ● It is suggested that mobile fog machine should be deployed at CT road and mining area, etc. ● CHP is equipped with sprinkler for dust suppression at source. Side cladding is provided at CHP for dust control.		

		(EC) for this and we will excavate as much to achieve our target. Thus, the pollution increases. Coal production will not expand here. The product quantity will remain same. The coal reserves/stock will remain same, but the area will increase. Coal production will not increase. But the area will expand. Additional 228 hectares of land will be required for this. He further said that as there is no increase in coal production, there will be no increase in dust quantity. Now the area of 228 hectares of land will be increased, mining will be done in it. There will not be use of drilling, blasting technology to avoid dust generation. The dust that is generated is due to coal. So, "Surface Miner Technology" will be used for that. The machine does not run until the sprinkler starts. It is the most advanced technology available so far. Till now, we had to use	• Transportation road is black toped from CHP to Check post, Check post to RC office and RC office to Sub Area Office to control fugitive dust dispersion in surrounding environment. • It has been observed that proper enclosure at one crusher unloading point is not available to control fugitive dust (Plate 7). It is suggested to construct canopy at unloading point of crusher. • 5 Nos. of mobile water tankers in various capacities are being deployed regularly for dust suppression on haul roads and coal transportation roads in mining area. • Mist type water sprinkling system is installed at mobile crusher assembly. • 10 Nos. fixed sprinklers and one fixed fog canon are installed at railway siding to suppress fugitive dust emission. It is observed that adequate dust suppression is not available at wharfwall of railway siding. It is also suggested to install long range fog canon at railway siding. • It was observed that adequate wind barrier is not available with suitable height for dust suppression at source. It is suggested that installation of the same may be done. • Wind barrier should also be installed at coal stock yard for dust suppression at source. • Fugitive dust emission is also being monitored quarterly and reported regularly. Dust monitoring is done by Personal Dust Sampler (PDS). • Transportation of coal from face to crusher is being carried out by dumper/truck. Further transportation of coal (-100 mm size) (around 80-90% of coal) from crushers (Coal Handling		

		public road for transporting coal. But it will be closed now. Now, as told in the meeting, we are going to stop using the public road in one and a half to two months. Rail sliding of Gauri Deep will be started soon. So, local people will not suffer.	Plant (CHP)) (Plate 6) to railway siding is being carried out for rake loading. Balance coal transportation from crushers is practiced through tarpaulin-covered trucks for road sale. ● 1 no. of Tractor mounted sweeping machine deployed on hiring basis on rotation for all the mines of Ballarpur Area. ● Wet drilling is being done. **Air Quality Monitoring And Preservation** ● Four (4) ambient air quality monitoring stations (2 in core and 2 in buffer) are established based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with SPCB for monitoring of SPM, PM10, PM2.5, SO2 and NOx ● Respirable Dust Sampler is being used for monitoring of PM10, SO2, NO2 and Ambient Fine Dust Sampler is being used for monitoring of PM2.5. ● Monitoring of SPM, PM10, SO2 and NO2 fortnightly and PM2.5 twice in a week are being done as per prescribed rule in core zone and buffer zone. ● The concentration of SPM, PM10, PM2.5, SO2 and NOx are found within the stipulated limits in core and buffer zone locations. ● Monitoring of heavy metals such as As, Ni, Cr, Cd and Hg are being carried out at once in six months. The concentration of Pb, Ni and As		

			were found below detection limit (BDL) and within the stipulated limits ● Monitored data is manually displayed at project site. . ● One online continuous ambient air quality monitoring station (CAAQMS) has been installed at Pauni-II OCP near Sasti OCP, Ballarpur Area in consultation with SPCB for monitoring of ambient air pollutants (PM10, PM2.5, SO2, NO2, and CO). ● Vehicular emissions of departmental/outsourced HEMM used in mines are monitored during maintenance schedule. ● Outsourced trucks used for transport of coal have valid PUC certificate. **Noise and Vibration Monitoring and Prevention** ● All HEMMs are provided with noise proof cabins. ● Delay detonators and Nonel are in use by for minimizing noise and vibration during blasting. ● Ambient and work zone noise monitoring plan is available and monitoring is carried out at CHP and colony in Ballarpur Area as per standard procedures, and average noise of ambient level at four locations were found within prescribed permissible limit. ● Worksite noise level is monitored in mine		

			premises at vulnerable locations. ● Earplug/muff distribution details are available for workers engaged in blasting and drilling operations, operation of HEMM, etc. ● It is suggested that workers engaged in blasting and drilling operations, operation of HEMM, etc. should wear ear plug/muff to protect from high level of noise in mine premises, where noise level is above 85 dBA due to mining activities (e.g. drilling, blasting). ● Ambient noise monitoring must be done by using tripod stand at above the ground level of 1 m to 1.5 m for areas instead of handheld device. ● PPE compliance such as use of ear plug is adequate. ● Adequate illumination has been provided in all strategic points of mine premises as per DGMS Standards. The report on the same is being submitted to the Ministry/RO on six-monthly basis. ● As per report biological clock of human being of the nearby village is not disturbed from lighting (flood lights) at night and sound. ● Transportation of coal (-100 mm size) (around 85-90% of coal) from Coal Handling Plant (CHP) (Plate 6) to railway siding is being carried out for rake loading. Balance coal is being transported through road sale by tarpaulin cover truck. ● Coal transportation route by truck is not falling through any village. ● The day and night noise level is being monitored on fortnightly basis and noise levels		

			were found well within the prescribed limits. **.Ground Water Recharge, Water Quality Monitoring, Domestic and Industrial Wastewater and Preservation** **Ground Water recharge Structure/ Rain water Harvesting** ● Three rooftop rainwater harvesting structure has been constructed at AGM office, and Sasti Guest House for groundwater recharge. However, it was observed that the Pit and rooftop connecting pipe rain water at Sasti Guest House was choked and broken during visit of audit team. (b) Ground water level monitoring through bore well and well ● Water levels are monitored by wells (Plate 24) and data are reported as half yearly compliance report. Recording is done manually four times in a year as stipulated. ● Regular monitoring of ground water level from existing wells is being done at various locations of buffer zone for four times a year i.e. during pre-monsoon (May), monsoon (August), post-monsoon (November), and winter (January) ● No impact was found on existing well ground water level in buffer zone from mining activities. Industrial Effluent and surface water quality,		

			Domestic wastewater monitoring and preservation ● Oil and grease trap has been installed in ETP before discharge of workshop effluents, however, oil and grease trap was not proper functioning during visit of audit team. ● ETP treated water has been made to reuse for washing of HEMM and dust suppression. ● The quality of treated water from sedimentation tank and ETP is monitored every fortnight. STP is available in core zone for treatment of canteen waste. It is suggested that STP should be made in area office / mine official colony for treatment of domestic waste and quality of outlet water should also be monitored. From the above it is evident that company is effortlessly working towards reducing the air pollution by implementing new and latest techniques in and around the project for the betterment of local people.		

Those present here demanded not to tell about Gauri Pauni, but to give information about Sasti and the dust pollution happening at Sasti.

Convener, Environment Public Hearing Committee also asked Project Proponent to give information about what they will do now (Immediately) and not about what they will do in the future.

Sr	Objection / Information /	Answers / Assurances			

. No.	Question	given by Project Promoter / Environmental Consultant / Environmental Public Hearing Committee as per discussion			
		Project Proponent informed that at the check post in Sasti village, Special Sprinklers are used all the time. Our water tanker is moving every day. Water sprinklers are also installed in the mine and in the mine area. Here, the Project Officer said that within a year, the coal residue that is kept outside will not be there. For redressal of the issue raised, the frequency of mobile water tankers for dust suppression at the said places will be increase immediately.	Project proponent has ensured that frequency will be increased of already deployed water tankers for dust suppression to minimize the dust pollution. Also, project proponent will increase the no. of sprinklers and rain guns in the project to control dust pollution in and around the project. All the pollution control measures will be implemneted as per EIA/EMP of the project. **Details of the existing measures are given below:** ● 08 nos. of Fixed sprinklers provided at 100 MT weigh bridge. ● 06 nos. Fixed sprinklers provided at CHP. ● 04- Fixed sprinklers along coal transportation road. ● Water spraying arrangement provided at mobile crusher. ● 11 nos. of rain guns installed at coal stockyard. ● Mobile crusher is covered with side cladding (CGI sheet) along with sprinklers to control dust pollution. ● Conveyor belt of mini CHP and main CHP are covered with CGI sheet. ● Presently 05 Nos. of Mobile Water Tankers are provided for dust suppression (Hired-1 no. of 04 KL, Departmental – 2 no. of 28KL and HoE Contractor tanker of 28 KL each) ● 01 no of hired road sweeping machine provided		

			on coal transportation road. • Brooming and maintenance of coal transport road and weigh bridge road is done regularly • Unloading point of CHP is equipped with mist spray sprinkling system. Receiving point and conveyor belt is fully enclosed. Fixed sprinkler is also installed at coal discharge point. • 01 no of Sedimentation tank for treatment of mine discharged water • 01 no of ETP of capacity 75 KL/day • Black topped road to control dust pollution. In this regard, company has recently ensured the NoC from PWD and developed the Black topped road of 1.8 km.) • Tarring of 06.00 km length of internal roads used by Coal Transportation trucks. • Coal carrying Trucks are covered with Tarpaulin and same is ensured by CCTV cameras installed at exit points. • Plantation of around __ Ha has been already done by FDCM and MPRVVN, to control dust pollution and to improve the aesthetic value of surroundings • Air quality Monitoring is carried out by CMPDIL fortnightly and it is evident that all values are well within the permissible limit. • Regular Inspections are done by environment officers and company and Maharashtra Pollution control Board time to time and it has been found that most of the control measure are in regular operation with some exceptions of breakdown. Further in this regard, additional provisions for the control of dust planned for the project are given below:		

			Future proposals under pipeline: ● 1 no of Tyre washing system will be in operation to control dust pollution. ● 5 nos. of Trolley mounted fogger system to control dust pollution ● 1 no. of CAAQMS system to monitor air quality 24*7 in and around the project. ● Plantation in an area of 47 Ha in and around the project to control dust pollution with 4 year annual maintenance to ensure the early survival. ● Development of new railway siding i.e Gauri deep siding which will effectively reduce road transportation to a great extant. ● Wind barrier along railway siding ● Rainguns along railway siding Above all, there is a provision of silo at Sasti expansion OC Project. Adoption of this mechanization will reduce the dust pollution to a great extant. Same has been approved by company's Board. and report finalization is under pipeline stage and it is expected that it willl be completed by march 2025. From the above it is evident that company is effortlessly working towards reducing the air pollution by implementing new and latest techniques in and around the project for the betterment of local people.	Rs. 40 lakhs Rs. 26 lakhs Rs. 88 Lakhs Rs. 1.2 crores Rs.237 lakhs Rs. 45 lakhs	December 2023 March 2024 July 2023 July 2023 August 2023 September 2023 December 2023 March 2025

At this time, those present while objecting about this said that such a big pile has been placed near the village. It is half a kilometer from the village. Not too far. The people of the village are suffering from its pollution. We suffer from dust so much that we cannot live in our houses. Company Officials informed that they will remove it in a year, but by then we will die from dust, air pollution. Project Proponent said that for this we have arranged for pumping water. Participants complained that the sprinkling system of the company is poor and many times it is out of order. We all suffer from pollution.

Here, Convener, Environment Public Hearing Committee suggested to the Project Proponent that frequency of the water tanker through sprinkling system should be extended immediately, so the dust will be suppressed. Convener directed the project officials to install additional sprinkling system on tankers. Similarly, the hot spots should be identified in the area and sprinkle the water there - tanker through sprinkling system. There – the quantity and frequency of watering should be increased on the roads, around the village. It was suggested to do it within eight days. Project officials promised to implement the above instructions within eight days. To counter the temporary rise in pollution the number of mobile tankers were doubled and also the frequency with which the sprinkling was done was increased. To further aid the pollution control sweeping of road was done on a regular basis to avoid accumulation of muck

8) Shri Kondu Rajeshwar Narad, Residence – Sasti, Taluka – Rajura, District – Chandrapur -

Sr. No.	Objection / Information / Question	Answers / Assurances given by Project Promoter / Environmental Consultant / Environmental Public Hearing Committee as per discussion	Action Taken/ Status as on 15/06/2023	Budget Provision	Timeline for Completion
1)	My agriculture field/farm is in Dhopatala project. The waste water of WCL's quarters is discharged into my farm for the last ten years. So, every year I lose 3-4 lakhs. For the past several years, I have been making applications, requests, meeting officials. Nothing is resolved. My farm is completely ruined. Not a single rupee of	Project Proponent replied that WCL Officers' committee along with the concerned complainant will survey the place and other places in the village and plan remedial measures. All the desired help will be extended from WCL for the resolving the	The concerned issue raies of of Dhoptala Project. In this regard, project wants to clarify regarding the generation and disposal of sewage waste from wcl quaterls colony. In this regard, there ia already a STP (Sewage Treatment Plant) of 1 MLD capacity is set up at WCL colony for treatment and disposal of sewage waste. No sewage of colony quarters is discharged to any other place. Also septic tanks and soak pits are also provided for the purpose.		

	income is earned from agriculture. Hence, steps should be taken to prevent sewage from entering into the farm . If no action is initiated, self-immolation will be done by me.	same, as per the committee recommedations	However, PP assured that project Officers' committee will survey the place and nearby places, along with the concerned complainant and will plan remedial measures accordingly. All the desired help will be provided from WCL for the resolving the same, as per the committee recommendations.		

9) Shri Haridas Zade, Sarpanch, Khamona (Mathra), Taluka – Rajura, District – Chandrapur :-

Sr. No.	Objection / Information / Question	Answers / Assurances given by Project Promoter / Environmental Consultant / Environmental Public Hearing Committee as per discussion	Action Taken/ Status as on 15/06/2023	Budget Provision	Timeline for Completion
1)	I am asking questions to the Environment Public Hearing Committee . I had protested for Padharkawani Coal Washery. Our Gram Panchayat has not received any reply from the Government. You come here, take a public hearing. WCL administration does not respect Maharashtra Government. The mine which is in my village, the nalla/drain diversion is just 50 meters away from my village. So if	Here the Chairman, Environmental Public Hearing Committee said that this committee does not approve any project, reject any project or recommend any project. This Committee is constituted to note the suggestions or objections of the local people regarding the proposed project in environmental	Any nallah diversion will be done only after obtaining NOC from concerned Irrigation department For Sasti OCM, design for diversion of Gouri nallah has been obtained and application for NOC has been submitted. Copy of correspondence attached as **ANNEXURE 10.**		

	the water of this drain and the water of the small drain accumulate, where will the bank water go? Hence, Environment Clearance should be approved only after checking all the map of the project . The drain is only 50 meters away and seven survey numbers have been left on the other side of the drain. There is also a mine. How can those people cultivate their agriculture fields? Local people have taken follow up with all. But WCL Administration does not respect Maharashtra Government. How people of these seven survey numbers can feed the family? The WCL administration has nothing to do with the village. For this, Sub Divisional Officer held a meeting and instructed WCL Administration to take those seven survey numbers. The WCL administration only gave assurances. WCL Administration apply different rules to survey no. 370, one has 24R, the other has 12R, 41R, 18R, which is the method? How the permission granted?	angle only. It is noted in the minutes of the meeting and it is submitted along with final EIA report, written suggestions/objections received after approval of Chairman, Environment Public Hearing Committee through Head Office of MPCB to Environment, Forest & Climate Change, Govt. of India, New Delhi. An Expert Committee takes further decision. This Committee is only to register your views whether positive or negative. Environment Clearance is approved by the Government.			
2)	.Shri Haridas Zade suggested to make available a copy of the minutes of the meeting.	Chairman of the Committee assured to make available a copy of the minutes of the meeting.	Project proponent assured to make available a copy of the minutes of the meeting. Also, same will be available at WCL Website on public domain. In addition to the same, copies will be available at Environment Department of Ballarpur		

			Area Office for reference.		
3)	Shri Haridas Zade suggested that the Government should be informed that permission should not be granted without acquisition of the abandoned land of seven survey numbers near the concerned drain. He said that we will pass the resolution in the Gram Sabha and submit it. Government of Maharashtra has approved the Integrated Farming/Partition Policy of fields. The WCL Administration does not believe that. Despite the project in Maharashtra, it does not accept the policy approved by the Maharashtra Government. Even though the job seekers have paid the royalty to the Maharashtra government, they are still not giving jobs in the project. There cannot be another drain at a distance of 50 meters. If the drain goes from our village, where will the back water go, the village will drown. So the project officer replies that we will build a big wall. We will call a special gram sabha in this regard, but no report should be sent in favor of the project. Also they take the land on both sides for the project and leave the space in between. The farmer cannot go to the field. Finally, the local farmer goes to the	The project promoter replied that the drain diversion is done as per the design done by CDO Nashik. However, the diversion of the drain is done only after the implementation of the preventive measure plan which CDO Nashik suggests. Similarly, instructions are taken from the Water Resources Department before diverting the drain. Similarly, all the information about the said project has been sent to our Legal Department and further action will be taken as per the advice given by them	Here it is clear that existing nallah/ drain has been passes through the outer boundary of Sasti open cast mine. It is a seasonal nallah which is proposed to be diverted . Proposed diversion to be done after receiving the drain design for, C.D.O Nashik of Maharshtra Govt along consultation with water resources department along with considering all the safety measures so that back flow of water can be controlled. Similarly it is also proposed a over bridge on proposed diverted nallah/drain considering H.F.L value so that frequent transportation can be done smoothly. Since left out Guts are out of project boundary so that they can be Acquired. However after discussion the matter with appropriate level, further action will taken as per the advice given by the appropriate level.		

	Tehsildar, the Maharashtra government has to settle the dispute because of the company.				

10)Shri Aakash Bongirwar, Residence – Sasti, Taluka – Rajura, District – Chandrapur :-

Sr. No.	Objection / Information / Question	Answers / Assurances given by Project Promoter / Environmental Consultant / Environmental Public Hearing Committee as per discussion	Action Taken/ Status as on 15/06/2023	Budget Provision	Timeline for Completion
1)	Shri Satish Bangar has raised some issues in the meeting under the Dhopatala, Sasti Ban on Land Piece / Tukada Band Act. Project Proponent did not respond in this regard. We want an answer to this because we are going to protest on the 18th. However, the answer should also come from the chief manager.	Project Proponent said that question is raised in respect of ban on Land Piece/Tukada Bandi has been asked here. Matter is sub judice. This is not the case here, we don't want to give jobs to project victims. But we will accept the decision which the court will give in this matter.	Matter is sub judice. Project proponent will accept the decision which the court will give in this matter.		
2)	Shri Bongirwar objected that while at Sasti project, 73 local people have been given jobs, then why ban on land piece rule imposed in Dhopatala? If justice is not	Project Proponent said that we are not against anyone. But as per the company rule, one of the 7/12 holders is given job.	Land acquisition is done through proper procedure as per the rules laid out by Government. The mine is following the R&R policy of the CIL, 2012 for matters related to employment and		

	served, we will shut down the mine on the 18th March, 2023.	Despite this public hearing on Sasti project, we have given answers on all issues, regarding Dhopatala mine. However, the decision taken by the court will be acceptable to us.	resettlement. In this regard, company has formed an R&R Committee for sorting out the land employment and compensation related matters: In this regard, Government has formed an Grievance Redressal Committee for sorting out the employment and compensation related matters: **Grievance Redressal Committee** : All the grievances of the land oustees are being dealt with. Grievance Redressal Committee which is formed at the district level to sort out the issues of the land oustees as per the CBA, 1957 with the following members: 1. District Collector- Chairman 2. MP/ Representative of MP- Member 3. MLA/ Representative of MLA- Member 4. Chairman, Panchayat Samitee- Member 5. Sub- Divisional Revenue Officer/ Sub- Divisional Magistrate- Member 6. Area General Manager, Ballarpur Area There is also an online platform available to the citizens 24x7 to lodge their grievances to the public authorities through website named as Centralized Public Grievance Redress and Monitoring System (CPGRAMS).		

Chairman, Environment Public Hearing Committee here directed the project promoters to call a separate meeting regarding the job.

11) Shri Purushottam Lande, Sarpanch, Kolegaon,Taluka – Rajura, District – Chandrapur :-

Sr. No.	Objection / Information / Question	Answers / Assurances given by Project Promoter / Environmental Consultant / Environmental Public Hearing Committee as per discussion	Action Taken/ Status as on 15/06/2023	Budget Provision	Timeline for Completion
1)	The issue of ban on land piece/Tukada Bandi which is being discussed, when 1,000 acres of land is taken, 50% i.e. 500 jobs is required to be provided in that project. Now 2,100 acres of land has been acquired in Dhopatala project. That means 1,080 posts are sanctioned in that project. Project affected people are 914 people. The company is spreading misunderstanding between local farmers and local people for no reason. If land is taken, not jobs, what will people eat?	At that time, Convener, Environment Public Hearing Committee suggested to the Project Proponent that a separate meeting should be held regarding ban on land piece/Tukada Bandi and employment. This public hearing is called for the proposed Sasti project and suggestions and objections regarding the same should be raised. Here Project Proponent assured that the issues raised by Shri Purushottam Lande will be discussed with top management.	Land acquisition is done through proper procedure as per the rules laid out by Government. The mine is following the R&R policy of the CIL, 2012 for matters related to employment and resettlement. In this regard, company has formed an R&R Committee for sorting out the land employment and compensation related matters: Land acquisition involved is of 227.15 Ha and employement generated will be 211 nos.	Rs. 42 crores as land compensation.	By end of August 2023.
2)	Shri Purushottam Lande has a question about Kolgaon that they are dumping Dhopatal soil, it falls in our Kolgaon. Kolgaon is a	Project Proponent said that all these issues pertaining to land will be discussed in the next day's meeting	The road built will be of adequate strength to cope with the traffic above and any natural calamity. Dumping is done in a planned manner and not in a hap hazard way. Dumping in the area will not cause any		

	flood prone village. I have been raising this topic to you for the last 6-7 years. Also the road that is built will not last, but the road should not be closed unless the road is completely asphalted. All villages should be rehabilitated immediately. In case of any damage, the Project Administration will be held responsible.		flood, due regard will be given to arrest silt from dumps by construction of garland drains and catch drains as and when required.		

12) Shri S. P. Uike, Residence – Antargaon, Taluka – Rajura, District – Chandrapur :-

Sr. No.	Objection / Information / Question	Answers / Assurances given by Project Promoter / Environmental Consultant / Environmental Public Hearing Committee as per discussion	Action Taken/ Status as on 15/06/2023	Budget Provision	Timeline for Completion
1)	The thorn trees which have been planted for plantation in Pauni Deep mine, now it is requested that the farmers who are there, have no road to reach on fields. Also, those who are there, their land has not been acquired, hence it should be taken.	Project Proponent said that Shri Uike's question is a valid one. While we are planting trees, under the guidance of Madhya Pradesh and Maharashtra Forest Department, local species/trees has been planted. But in our WCL land, we plant only native species and cultivate local species as well as	In sasti OC project, Project has planted trees, under the guidance of MPRVVN and Maharashtra Forest Department, local species/trees has been planted i.e native species and cultivate local species as well as medicinal plants, fruit trees etc. Acacia species has not been planted by the WCL administration. It grows naturally in Vidarbha area. Plantation covering an area of 169.15 ha has been done with a total 5,15,500 Nos. of saplings in existing Sasti OC Mine, till 2014. (Plates 1, 3 and 4). Species planted includes Shisham (Dalbergia sissoo), Teak (Tectona gradis), Bamboo, Siwan (Madhuca longifolia), Neem (Azadirachta		

<table>
<tr>
<td></td>
<td></td>
<td>medicinal plants, fruit trees. He asked Environmental Officer of the project to reply</td>
<td>indica), Peepal (Ficus religiosa), Subabool (Leucaena leucocephala), Bija (Pterocarpus marsupium) , Nilgiri (Eucalyptus sp.), Gulmohar (Delonix regia), Karanj (Pongamia pinnata), Imli (Tamarindus indica), Amla (Phyllanthus emblica), Quickstick (Glircidia sepium), etc.
As per the plantation report, a total of 169.15 ha has been planted with 5,15,500 tree saplings, which include 88.22 ha plantation in external OB dumps and embankment, 20.75 ha plantation on internal backfilled dumps, 1.1 ha avenue plantation and 59.08 ha safety zone/greenbelt plantation. :
<table>
<tr><th>Site/location</th><th>Area (ha)</th><th>No of Trees Planted</th></tr>
<tr><td>Plantation on External OB dumps (including embankment)</td><td>88.22</td><td>286950</td></tr>
<tr><td>Plantation on Internal backfilled OB Dump</td><td>20.75</td><td>51875</td></tr>
<tr><td>Plantation on Waste lands/ Barren/ degraded lands</td><td>--</td><td>--</td></tr>
<tr><td>Avenue (transport/service roads) plantation</td><td>1.1</td><td>4000</td></tr>
<tr><td>Safety zone/greenbelt plantation</td><td>59.08</td><td>172675</td></tr>
<tr><td>Plantation around silo, coal stack yard, infrastructure, etc.</td><td>--</td><td>--</td></tr>
<tr><td>Total</td><td>169.15</td><td>5,15,500</td></tr>
</table>
In addition to the same, in FY 2023-24 target plantation is 117500 nos over an area of 47 Ha, covering mines under the control of Ballarpur Area. This plantation will carried out by MPRVVN Ltd.</td>
<td>Rs.1.2 Crore</td>
<td>July 2023</td>
</tr>
</table>

			There is no such acquisition that causes hardships to farmers in the area. WCL is committed to provide help to farmers, in case if required.		
		Project Environment Officer replied that WCL Ballarpur Area working with State Forest Agency and has planted various fruit trees, timber, plums, sitafal etc. among the local species. Many local species are cultivated. The Acacia plant will be removed step by step with the cooperation of Forest Department, Government of Maharashtra and a green belt will be developed there. We are going to develop 24 hectares of green belt on both sides of the road. Similarly, as per the MoU, trees are planted every year and similarly the trees that die are also replaced by casualty. Financial provision has been made for this. Further action will be taken in this regard in future as well.	Reply as given above.		

13) Shri Sunanda Reddy, an Environmentalist, Hyderabad -

Sr. No.	Objection / Information / Question	Answers / Assurances given by Project Promoter / Environmental Consultant / Environmental Public Hearing Committee as per discussion	Action Taken/ Status as on 15/06/2023	Budget Provision	Timeline for Completion
1)	My best wishes to the local people and WCL management. I will only talk about environmental issues here. Plantation is good here. But if possible Miyawaki plantation should be done. The local women's association should be involved in planting these trees. This project will provide employment to the local people. Project Authorities have assured to sprinkle water on the road through tankers, thus keeping dust pollution under control. Shri Reddy said that this mine will save foreign exchange worth of Rs. 4000 crores. Mining is under the jurisdiction of the Government of India, so we must co-operate with the Government of India. Along with this, the welfare of farmers and local people is also important. However, a Co-ordination Committee should be established here, in which Sarpanch and Project Manager of	Project Officers said that Shri Reddy informed how important mining is to the country's economy. We want to run industries in co-ordination with local farmers, local people. Mining and society are two sides of the same coin. He said that we have started work on Miyawaki Forest. Project Proponent gave detailed information about Miyawaki Forest in the meeting. He said that one hectare plot has been reserved in Nagpur and it will be developed in other places after the experience.	Noted		

	the local villages should participate and convene a meeting every three months to solve the problems of the local people. Along with the progress of the country, local progress and pollution control are also important. Shri Reddy said that not only mining causes pollution, but also ten other things cause pollution viz fertilizer; pesticides; vehicular pollution; plastic pollution; Life style food habits; chemical industries; These factors creates most pollution.				

14)Shri Ganesh Nate, Residence – Dhuptala, Taluka – Rajura, District – Chandrapur :-

Sr. No.	Objection / Information / Question	Answers / Assurances given by Project Promoter / Environmental Consultant / Environmental Public Hearing Committee as per discussion	Action Taken/ Status as on 15/06/2023	Budget Provision	Timeline for Completion
1)	I am working in Sasti mine. Lives in Dhopata. The problems are more and more. We want Sasti extension to be completed. But at the same time, trade is going on here. Similarly, local people will get employment here. However,	Project Proponent in reply said that the views raised by Shri Ganesh Nate are correct. When mining starts, the whole community life here is affected. The entire	The said Sasti-Rajura road is under Public Works Department. 90% work has been done and no objection certificate has been also received from the collector office and it will be repaired completely at the earliest.	Rs. 1.1 crore	June 2023

	the Sasti-Rajura road should be repaired immediately.	economic system here changes. He advised about the public road. The said Sasti-Rajura road is under Public Works Department. 50% work has been done and no objection certificate has been received from the collector office and it will be repaired as soon as possible.			

15) Shri Vijahy Gajanan Khankate, Residence – Rampur, Taluka – Rajura, District – Chandrapur -

Sr. No.	Objection / Information / Question	Answers / Assurances given by Project Promoter / Environmental Consultant / Environmental Public Hearing Committee as per discussion	Action Taken/ Status as on 15/06/2023	Budget Provision	Timeline for Completion
1)	I am an employee of WCL for the last 30 years. My house is nearby. We too have come a long way. The local people have given their land for the project and the project stood up. It is because of them that we got employment. People come here from all over the country. Many people have shared their problems here. So here are the senior officers of WCL, the local people are suffering, similarly we mine	Project Proponent said that the PWD road has received a no objection certificate and the road is half repaired. The rest of the road will be repaired. For those living near villages, OPDs are open daily. Villagers are always welcome if they have any medical needs.	Project proponent wants to highlight the fact that after the operation of new Sasti Expansion OC Project, there will be no increase in coal dust pollution considering the fact there will be no increase in production, this public hearing is only for expansion of area, keeping the production same as earlier I.e Peak 2.5 MTPA. Further, project proponent would like to state that project is committed towards controlling air pollution in and around the project due to mining activity. All Pollution control measures are in place working effectively at Sasti OC Project. However project is		

	workers are also suffering. There is a problem of dust in mines area and various committees have been formed here. There are discussions with the Environment Committee from time to time. The road was bad till the check post. Now it is repaired 15 days ago. But the PWD road is bad. If the project area increases, employment will be generated. People need more employment. Similarly, further action should be taken regarding those who raised the problem. The hospital here is quite big. One day in a week should be reserved for villagers. It will help to solve their health problems. This is just my suggestion. Also, it is necessary for the WCL administration to communicate with the villagers from time to time. Problems can be solved only through communication. Thanks to those who asked questions here.		committed towards the same by implementing new and latest techniques also (as per EIA/EMP) along with existing measures. In relation to coal stock yard of DhoptalaOC, Project has already constructed wind barrier to minimize dust pollution. **Details of the existing measures are given below:** ● 08 nos. of Fixed sprinklers provided at 100 MT weigh bridge. ● 06 nos. Fixed sprinklers provided at CHP. ● 04- Fixed sprinklers along coal transportation road. ● Water spraying arrangement provided at mobile crusher. ● 11 nos. of rain guns installed at coal stockyard. ● Mobile crusher is covered with side cladding (CGI sheet) along with sprinklers to control dust pollution. ● Conveyor belt of mini CHP and main CHP are covered with CGI sheet. ● Presently 05 Nos. of Mobile Water Tankers are provided for dust suppression (Hired-1 no. of 04 KL, Departmental – 2 no. of 28KL and HoE Contractor tanker of 28 KL each) ● 01 no of hired road sweeping machine provided on coal transportation road. ● Brooming and maintenance of coal transport road and weigh bridge road is done regularly ● Unloading point of CHP is equipped with mist spray sprinkling system. Receiving point and conveyor belt is fully enclosed. Fixed sprinkler is also installed at coal discharge point. ● 01 no of Sedimentation tank for treatment of mine discharged water ● 01 no of ETP of capacity 75 KL/day		

			• Black topped road to control dust pollution. In this regard, company has recently ensured the NoC from PWD and developed the Black topped road of 1.8 km.) • Tarring of 06.00 km length of internal roads used by Coal Transportation trucks. • Coal carrying Trucks are covered with Tarpaulin and same is ensured by CCTV cameras installed at exit points. • Plantation of around __ Ha has been already done by FDCM and MPRVVN, to control dust pollution and to improve the aesthetic value of surroundings • Air quality Monitoring is carried out by CMPDIL fortnightly and it is evident that all values are well within the permissible limit. • Regular Inspections are done by environment officers and company and Maharashtra Pollution control Board time to time and it has been found that most of the control measure are in regular operation with some exceptions of breakdown.		
			Future proposals under pipeline: • 1 no of Tyre washing system will be in operation to control dust pollution. • 5 nos. of Trolley mounted fogger system to control dust pollution • 1 no. of CAAQMS system to monitor air quality 24*7 in and around the project. • Plantation in an area of 47 Ha in and around the project to control dust pollution with 4 year annual maintenance to ensure the early survival. • Development of new railway siding i.e Gauri deep siding which will effectively reduce road	Rs. 40 lakhs Rs. 26 lakhs Rs. 88 Lakhs Rs. 1.2 crores	December 2023 March 2024 July 2023 July 2023 August 2023

			transportation to a a great extant. • Wind barrier along railway siding • Rainguns along railway siding Above all, there is a provision of silo at Sasti expansion OC Project. Adoption of this mechanization will reduce the dust pollution to a great extant. Same has been approved by company's Board. and report finalization is under pipeline stage and it is expected that it willl be completed by march 2025. The Sasti-Rajura road is under Public Works Department. 90% work has been done and no objection certificate has been also received from the collector office and it will be repaired completely at the earliest. Also, those roads which comes directly under the control of WCL are under development stage. In this regard, project proponent would like to state that WCL has its own Area Hospital to provide medical facilities to all local people. The hospital has 25 beds with a 24 hours causality, working OT, OPD (9am to6pm) and 24 hours Inpatient department with separate male and female ward and isolation wards. The hospital has a total manpower of 94 employees consisting of SKILLED MANPOWER-46 & UNSKILLED MANPOWER -35 and CONTRACTUAL MANPOWER -13.	Rs.237 lakhs Rs. 45 lakhs Rs. 1.1 crore	September 2023 December 2023 March 2025 June 2023

WELFARE HEALTH CAMPS DONE AT BALLARPUR AREA IN YEAR 2022:

S. No.	Name of the camp	Location	Date done	Beneficiaries
01	Blood Donation camp	Area Hospital	30.09.22	24
02	BMD camp	Area Hospital	22.10.22	75
03	Eye checkup camp	Area Hospital	29.10.22	129
04	General Health checkup plan	Ballarpur Dispensary	09.01.23	73

CSR HEALTH CAMPS DONE AT BALLARPUR AREA:

S.No.	Name of the camp	Location	Date done
01	Osteoporosis camp	Gouri village	18.09.22
02	Cancer screening	Sasti	27.09.22

				camp	village			
				03	Tubectomy operation camp	Khadoli PHC	09.12.22	
				04	General Health checkup camp	Kolgaon village	18.12.22	
				05	Tubectomy operation camp	Khadoli PHC	24.12.22	
				06	Tubectomy operation camp	Khadoli PHC	01.01.23	
				07	General Health checkup camp	Sakhri village	16.01.23	
				08	Tubectomy operation camp	Khadoli PHC	14.01.23	
				09	Tubectomy operation camp	Khadoli PHC	28.01.23	
			From the above it is evident that company is effortlessly working towards reducing the air pollution by implementing new and latest techniques in and around the project for the betterment of local people.					

Sub Area Manager,
Sasti Sub Area,
Ballarpur Area,
Western Coalfields Limited

Action Plan on issues raised during public hearing of Sasti Expansion OC Project as per MoEF&CC OM dated 30.09.2020

<table>
<tr><th>Sr. No.</th><th>List of Issues raised</th><th>Category</th><th>Budgetary Provisions (in Rs. Lakhs)</th><th>Expenditure done since Public Hearing (in Rs. Lakhs)</th><th>Status as on 06.09.2025</th></tr>
<tr><td>1</td><td>R&R, Land compensation, Employment</td><td>R&R</td><td>4418.00</td><td>4259</td><td>42.59 crores have been paid till date in regards to land compensation. Remaining are pending due to some subjudice cases within the land owners.
122 nos. of employments have been sanctioned.</td></tr>
<tr><td>2</td><td>Dust suppression measures</td><td>Dust suppression</td><td></td><td>33.00

24.00

69.00

60.00

175.00

20.00</td><td>• 1 no of Tyre washing system installed.
• 4 nos. of Trolley mounted fogger system installed.
• 1 no.of CAAQMS system installed
• Plantation in an Area of 18 Ha done.
• Wind barrier along railway siding
• Rainguns along railway siding installed.</td></tr>
<tr><td>3</td><td>Community Health Initiatives</td><td></td><td></td><td></td><td></td></tr>
<tr><td>a</td><td>Rural Medical Camps through Medical Team of Primary Health Centre</td><td>Health</td><td>In FY 25-26 21.24 Crores</td><td>1054.00</td><td>Medical facilities and locations:
<table><tr><th>S.no</th><th>Facility type</th><th>Location</th><th>Distance from Sasti Mine</th></tr><tr><td>1</td><td>Dispensary</td><td>Gouri</td><td>300 m</td></tr></table></td></tr>
</table>

2	Dispensary	Ballarpur	8 km
3	Ballarpur Hospital	Sasti township	2km

The hospital was initially established as a dispensary in 1998 and was later upgraded to a 25-bedded Ballarpur Area Hospital in the year 2000.The hospital is well-equipped and supported by trained technical staff to effectively handle a wide range of medical needs.

Hospital facilities:

i. **Medical infrastructure and equipment**

a) Facilities like OT room, 24 hrs causality room, labour room etc.
b) Medical equipment's like ECG, cardiac multipara, oxygen concentrators, auto clave, Defibrillator gynecological examination couch etc,
c) 7 life-support ambulances deployed across the Area Hospital and associated dispensaries.

Figno.3 Ward Room

Fig no.4 Ambulance

Figno.5OT room

Figno.6ECG machine

Figno.7Biochemistry analyser-Pathalogy

Figno.8X-ray mahcine

ii. Medical staff and overall manpower distribution (including paramedical staff)

- Overall Manpower distribution

Total Man power	Skilled manpower	Unskilled manpower	Contractual manpower	Medical staff
112	51	32	16	13

- Medical staff distribution

Facility	Number of doctors
Ballarpur Area Hospital(Sasti)	11
Ballarpur Sub-Area dispensary	1
Gouri Sub-Area dispensary	1

Details of the admissions in last three years.

Details of entitled and non-entitled patients (IPD admission)			
Financial Year	**Entitled**	**Non-entitled**	**Total**
2022-23	1723	172	1895
2023-24	2086	22	2108
2024-25	2422	86	2508
Up to July'2025	779	56	835

CSR camps held during FY 2024-25 in the nearby villages:

S.no	Date	CSR Camps	Village	Beneficiaries
1	15.06.2024	General – H-Camp, with BMD	Sasti	200
2	26.06.2024	General – H-Camp, with BMD	Gouri	192

						3	12.07.2024	General – H-Camp, with BMD	Mathra	103	
						4	24.08.2024	General – H-Camp, with BMD	Chincholi	247	
						5	19.09.2024	General – H-Camp, with BMD	Pauni	76	
						6	20.09.2024	Safai Mitra Suraksha Shivir	AHB	42	
						7	20.09.2024	T.T.Camp (Kadholi PHC)	AHB (Kadholi)	09	
						8	26.09.2024	General – H-Camp, with BMD	Goyegaon	160	
						9	01.10.2024	General – H-Camp, with BMD	Muthra	158	
						10	04.10.2024	General – H-Camp, with BMD	Khamona	146	
						11	19.10.2024	T.T.Camp (Kadholi PHC)	AHB	10	
						12	23.10.2024	General – H-Camp, with BMD	Arvi	207	
						13	06.11.2024	General – H-Camp, with BMD	Kolgaon	91	

						14	14.11.2024	T.T.Camp (Kadholi PHC)	AHB	06
						15	27.11.2024	General – H-Camp, with BMD	Antergaon	141
						16	07.01.2025	General – H-Camp, with BMD	Hirapur	60
						17	15.01.2025	General – H-Camp, with BMD	Manoli	90
						18	30.01.2025	General – H-Camp, with BMD	Sasti	224
						19	11.02.2025	General- H— Camp,with BMD	Chincholi	182
						20	12.02.2025	General- H— Camp,with BMD	Sakhri	169
4.	**Corporate Social Resposibility**	CSR	in FY 25-26: 355.0 Lakhs	379.50						

Sr no.	Year	Expenditure (lakhs)
1	2019-20	237.35
2	2020-21	47.05
3	2021-22	2.17
4	2022-23	25.52

					5	2023-24	60.3	
					6	2024-25	379.35	
5	**Infrastructure creation for drinking water**							
a	Construction of borewell for water supply	**Drinking water supply**		24.8	Work completed			
b	Providing RO plant	**Drinking water supply**		8.76	Work completed			
6	**Education Initiatives**							
a	Distribution of furniture such as Tables, Sports equipment etc. in Schools.	**Education**		3.99				
7	**Community Rural Infrastructure Development**							
a	Construction of CC roads in Sasti village.			43.00				
		TOTAL		**1895.05**				

CSR Expenditure for last five years is as below:

Sr no.	Year	Expenditure (lakhs)
1	2019-20	237.35
2	2020-21	47.05
3	2021-22	2.17
4	2022-23	25.52
5	2023-24	60.3
6	2024-25	379.35

Annexure – 38.

Photos of CSR Activities

YOGA SHED AT DHUPTALA VILLAGE

DIGITAL LIBRARY AT DHUPTAL VILLAGE

DRAINAGE AT RAMPUR VILLAGE

vivo V40 | ZEISS

15mm f/2.0 1/380s ISO50
04/11/2025, 12:12

vivo V40 | ZEISS

15mm f/2.0 1/621s ISO50
04/11/2025, 12:12

GPS Map Camera
Rampur, Maharashtra, India
Q8vv+36, Rampur, Maharashtra 442905, India
Lat 19.792702° Long 79.341183°
27/01/25 12:26 PM GMT +05:30
Google

Western Coalfields Limited
(A Subsidiary of Coal India Limited)
***Welfare / CSR* Department**
5 DECADES OF UNEARTHING ENERGY

Email-gmcsr.wcl@coalindia.in ☎ **0712 -2510558**

Ref:WCL/CSR/2025/ 46 **Date: 3rd June, 2025**

क्षेत्रीय महाप्रबंधक
वेकोलि, बल्लारपुर क्षेत्र

विषय: CSR Action Plan 2025-26

महोदय,

Please refer to the CSR Action Plan 2025-26 submitted by your Area. In this connection, WCL Board in its 376th Meeting held on 24th May, 2025 has approved the CSR Action Plan Activities of 2025-26. Given below is the summary of CSR budget sanctioned for FY 2025-26 for your area:

#	Head	CSR Budget Sanctioned (in Rs Lakhs)
I	CSR Action Plan including Swachhta & Medical Camps	353.34
II	Project Pancha Tatva	25.75
III	Rejuvenation of Traditional Water Bodies	70.00
	Total	**449.29**

As informed by Finance Department, CSR Budget for above activities have been added in SAP under CSR head, hence budget certification will not be done from WCL HQ. Under Decentralized system, Budget certification for individual activities is to be done by Finance Department at Area HQ. The list of approved CSR Action Plan activities are as given below:

Component-I- CSR Action Plan including Swachhta & Medical Camps:

Sl. No	Name of CSR Activity	Sanctioned Budget (In Lakhs Rupees)
1	Swachhta Action Plan activities	3.00
2	Organizing Medical camps at nearby villages of mines	4.00
3	Organizing Village Sports for encouraging village youth to focus on fitness	5.00
4	Activities for Rural development and female empowerment	1.50
5	Construction of Drainage - Gouri-350m	33.25
6	Construction of Drainage at Dhoptala-350m	33.25
7	Construction of Drainage at Sakhari-200m	19.00
8	Construction of Drainage at Mathra-300m	28.50
9	Construction of Drainage at Rampur-200m	19.00
10	Construction of Drainage at Babapur-200m	19.00
11	Installation of RO at Dhoptala	12.00
12	Construction of Yoga Shed at Mathra/ Cultural shed near Hanuman temple	8.00
13	Borwell At Dhopatala	7.50
14	Distribution of Street Lights at nearby villages	5.00

15	Construction of Drainage at Kalamna/ Nimbala-200m	19.00
16	Installation of Open Gym at Rampur	2.00
17	Construction of Drainage Chunala-(200m)	19.00
18	Construction of Drainage at Charli- 300m	28.50
19	Construction of Drainage at Kadholi-300m	28.50
20	Construction of Drainage at Waroda -160m	15.20
21	Installation of Open Gym at Kalamna	2.00
22	Installation of Open Gym at Kadholi	2.00
23	Installation of Open Gym at Nimbala	2.00
24	Installation of RO Plant Chunala village	12.00
25	Dining shed at School Rampur	7.00
26	Financial Assistance to Muncipal Council Rajura for procurement of 5000 pair of Dry & Wet dustbins for household distribution	18.34
	Total	**353.34**

Component-II- Project Pancha Tatva:

Sl. No	Name of CSR Activity	Sanctioned Budget (In Lakhs Rupees)
1	Installation of RO Purifier at Rajura High School	0.25
2	Installation of Solar Panel at Rajura High School	15.50
3	Providing Nutrition Kit for Students at Rajura High School	10.00
	Total	**25.75**

Component-III- Rejuvenation of Traditional Water Bodies(Amrit Sarovar):

Sl. No	Name of CSR Activity	Sanctioned Budget (In Lakhs Rupees)
1	Rejuvenation of Sakhari Pond(Traditional Water Body) under Amrit Sarovar Program	70.00

You are requested to arrange for execution of above works strictly as per WCL's CSR Policy and DPE Guidelines and advise the concerned to implement the activities by following the completion schedule given below and various other instructions without fail.

Completion schedule:

TASK	TIME LINE for Area
Award of work	31st July, 2025
Completion of work	30th November, 2025

Other instructions:

- Monthly Progress Report indicating CSR Expenditure and Status as on 25th of the month (the period 26th-25th may be considered) should reach this office strictly by 26th of the month through Email to gmcsr.wcl@coalindia.in. Incase of NIL expenditure, the same should be sent.
- A Quarterly implementation status report of above activities should be sent to the office of undersigned for appraisal of the same to WCL Board.
- The Name of **approved work** as shown above should not be changed in the monthly progress reports or in any other reports by the Area.
- The Sanctioned Budget for each activity should not be changed by the Area. A separate column for Actual amount after Tender may be indicated in monthly progress and balance budget(Sanctioned Budget minus awarded value) should be surrendered to WCL HQ.

- The officers concerned should ensure that the above approved activities are to be booked under CSR head only.
- Any CSR activity approved by AGM, as per DOP of WCL CSR policy **should** be sent to CSR Dept, WCL HQ for Budget allocation.

संलग्न: यथोपरि

भवदीय,

विभागाध्यक्ष(कल्याण/सी.एस.आर)

3-6-25

प्रतिलिपि

- सी.एम.एस, वे.को.लि मुख्यालय, नागमुर- उचित जानकारी हेतु
- विभागाध्यक्ष(सिविल-**कल्याण/सी.एस.आर**), वे.को.लि मुख्यालय, नागपुर- उचित जानकारी हेतु
- क्षेत्रीय कार्मिक प्रबंधक, वे.को.लि **बल्लारपुर** क्षेत्र - उचित कार्यवाई हेतु
- अम्ला अधिकारी (**सिविल**), वे.को.लि **बल्लारपुर** क्षेत्र - उचित कार्यवाई हेतु
- क्षेत्रीय वित्त प्रबंधक, वे.को.लि **बल्लारपुर** क्षेत्र - उचित कार्यवाई हेतु

Capital Expenditure status:

Sr no	Provision for Activity	Capital Provision (Rs. Lakhs)	Present status	Actual Expendiure (Rs. Lakhs)
	a) 3 Nos- 28 KL: In the mine for controlling dust in and around the project. b) 2 Nos- 16 KL : From Sasti mine to Mathra village turning (i.e 3 km road patch of coal transportation route)	608.26	Work taken up under Revenue expenditure on hiring of tanker basis. Same to be done throughout mine life.	60.00
	Provision made for Additional Fixed Sprinklers a) covering remaining 3 kms of coal transporta2on route from mine to Gouri deep siding – 75 nos with 15 meters of throw b) Covering coal stock yard of Sasti Expansion OCM with 20 sprinklers c) Installation of Rain guns at Gauri Deep railway siding - 16 nos.	150.00	Work to be taken up in FY 25-26 Work to be taken up in FY 25-26 Work completed	30.00
	a) 1 no proposed for Sasti Expansion OC Project. b) Additional 4 nos in neighboring mines. One no. brimming machine in Gauri deep, Pauni II, Gauri Pauni, Ballarpur OC	43.11 80.00	Sweeping machine deployed Work to be done hiring basis in FY 25-26	30.00
	7 no's of trolley mounted fogger with 100 m throw.	70.00	7 nos. Foggers installed	42.00
	Covering 6 kms of coal transportation route from mine to Gouri deep siding – approx. 5000 no's bamboo plantation and also inside mine lease area along the embankment, OB dumps etc	70.00	Work to be taken up in FY 25-26	
	1 no of CAAQMS is proposed to be installed for Sasti Expansion OC Mine.	75.00	CAAQMS installed	70.00
	Dust Barrier along the coal transportation road to protect Goyegaon village of 12 feet height for 750 m patch on initial basis. Wind barrier is under final stage of completion of height aprox. 18 feet. Along the railway	75.00 175.00	Work to be taken up in FY 25-26 Work completed	175.00

	track (1km length) to control dust pollution.			
	TOTAL	**1341.37**		**407.00**

To,
Shedame Constructions

WESTERN COALFIELDS LIMITED
OFFICE OF THE AREA GENERAL MANAGER,
SASTI TOWNSHIP. TAH. RAJURA DIST. CHANDRAPUR.

AGREEMENT NO.:-WCL/CGM/BA/CIVIL/C-462/23-24/AGMT.NO./38/2023-24.
1/2/2024

NAME OF WORK :- **"Erection of Bamboo net barrier along Coal transportation road near Sasti Village at Sasti Expansion OCM under Sasti Sub Area."**

NAME OF AGENCY ;- **Shedame Constructions,**

Radhakrishna Kunj, Tukum,

CHANDRAPUR

AWARDED VALUE :- **Rs.29,42,085.36** (Rupees twenty nine lakhs forty two thousand eighty five & paise thirty six) only **including GST.**

WORK ORDER REF.:- WCL/CGM/BA/CIVIL/C-462/23-24/752 DT.28.11.2023.

B.C.NO:-This has reference to B C.No:-BA/RB/BSA/E1424/115A/GL41100019/ENV/EMP/OTHER ENVIRONMENTAL/2023-24 DT.26.11.2023 FOR Rs.29,42,085/- (COST CENTER:- WCL9243800)

DATE OF COMMENCEMENT :- 20.12.2023

DATE OF COMPLETION ;- .17.02.2024.

For, Shedame Construction

Proprietor

1/2/24

(5)

Under Jurisdiction of Nagpur Court Only "

OFFICE OF THE GENERAL MANAGER
Civil Department, AHQ, Ballarpur area
WESTERN COALFIELDS LIMITED
A Miniratna Company
(A Subsidiary of Coal India Limited)

Post. Sasti-(Rajura) Pin-442706, Dist. Chandrapur (M.S).
Mob-8275968274, 8275968514
email Id:-soccivil.wclba@gmail.com, website:- http://www.westerncoal.in

Ref. No. WCL/CGM-BA/Civil/C-462/23-24/ 752 **Date:-** 28/11/2023

To,
Shedame Constructions,
Radhakrishna Kunj, Tukum,
CHANDRAPUR

E-mail ID:-shedameconstructions@gmail.com
Mobile no. -9158358777

Subject: -LOA for the work of: "Erection of Bamboo net barrier along coal transportation road near Sasti Village at Sasti Expansion OCM under Sasti Sub Area."

Ref.: -1. Your bid against NIT no. ba3650-civ-e114-2023-24/655 Dt.28.10.2023
Tender ID no. 2023_WCL_292280_1.

Dear Sir

With reference to the above, this is to inform you that the above-mentioned work is hereby awarded to you for a total value of **Rs.24,93,292.68** (Rupees twenty four lakhs ninety three thousand two hundred ninety two & sixty eight paisa) only without GST. The GST Tax component is **Rs.4,48,792.68,** The breakup of quoted amount is as given below.

Sl.No.	Description	Rate	Amount
1.	Schedule Items	Item Rate	**Rs. 24,93,292.68**
2.	GST 18% OR AS APPLICABLE	**TOTAL Rs.**	Rs. 4,48,792.68 **Rs.29,42,085.36**

The award of work is with the stipulation that all the terms & conditions as prescribed in the tender documents shall be operative. The details of LOA are as given below:-

1.All material required for the work shall be arranged by you at your own cost of approved qualities and specification.

2.The time of completion for the work shall be **60 (Sixty) days** from the date of commencement. The work shall be deemed to have commended from expiry of 10 days from issue of LOA or from date of Site hand over whichever is later or the date of Commencement will be decided as per mutual consent prior to the dates as prescribed above.

3.The EMD of **Rs.58,000/-**deposited ONLINE vide Ref No.302747995445 vide UTR No.148789818 Dt.09.11.2023 has been treated as part of Security deposit. You are requested to deposit balance security deposit of **Rs.89105/-**to make total security deposit of **Rs.1,47,105/-**(inclusive of EMD) i.e.,5% of awarded value as per security clause within 21 days of receipt of this letter.

4.Schedule Item no.**2,3,4,5,6,7 & 9 are ALR items** Hence these items shall be dealt as per clause 5.6 of General Terms& conditions of the contract.

5.The total liability of GST will remain with Contractor.

6. Whatever input credit will be available be available to you against the above work, the same shall be passed on to WCL bill wise by you.

or, Shedame Construction
Proprietor

28/11/23

7.The item wise rate quoted by you shall be inclusive of all taxes, duties & levies but excluding GST Compensation Cess, if applicable. The payment of GST & GST Compensation Cess by Service WCL to you (if GST payable by bidder/Contractor) would be made only on the latter submitting a in accordance with the provision of relevant GST Act & the rules made there under & after online valid return on GST portal. Payment of GST & GST Compensation Cess is responsibility of the Contracto

8.ITC is not available for the work and Input tax credit (ITC) is to be availed by WCL as rule.

9.If WCL falls to claim Input tax Credit (ITC) on eligible Inputs, input service & Capital Goods or the claimed is disallowed due to failure on the part of supplier/vendor of goods & services in incorporating tax invoice issued to WCL in its relevant returns under GST, payment of CGST & SGST or IGST, GST (Compensation to State) Cess shown in tax invoice to the tax authorities, issue of proper tax invoice or any other reason whatsoever, the applicable taxes & Cess paid based on such Tax invoice shall be recovered from the current bill or any other dues of the you along with interest, if any.

10. The ITC to be passed on by you by way enclosing original tax input invoice with bill.

11. All invoices submitted by you should be in the form of GST invoice giving all details as required under the law. You will have to raise invoices strictly adhering to provision of section 31 of CGST ACT 2017 along with Rule 46 & 47 of CGST Rule 2017. You will indicate the rate as well as amount of CGST, SGST or IGST in invoice. You will have to upload the details of invoice in GST portal as per the provision of GST ACT. Invoice issued by you should bear GST registration of WCL to enable WCL to claim input tax credit **GSTIN of WCL is 27AAACW1578L1ZW** for MAHARASHTRA.

12. You will have to file all the returns & details as applicable under GST laws & rule within due dates. You will have to give an undertaking on invoice ,or as separate Annexure along with invoice that invoice/applicable GST return has been/ will be uploaded in GST portal within due time as prescribed in CGST ACT and CGST,SGST or IGST has been deposited as per provision of GST ACT & RULES thereon.

13. If there is any delay in payment against invoice due to your fault & any reversal of Input tax arises the same will be recovered from you along with interest and penalty, if any, as paid by WCL due to reversal.

14. In case of GST rating of vendor on the GST portal/Government Official Website is negative/blacklisted at any stage even after award of work, WCL has right to Cancel the letter of Award. WCL shall not be obligated or liable to pay or reimbursed GST to you & shall also be entitled to deduct/ recover such GST along with all penalties/interests, if any, incurred by WCL.

15. You will have to issue Credit note as per provision of Rule 53 of CGST ACT 2017 on quality deduction or liquidity damages, if any arises.

16.If any default is committed by you in uploading the invoice/applicable GST return or default in deposit of applicable GST taxes, WCL reserve the right to upload such defaulter on WCLWebsite and may also debar you from participating in future tenders for a minimum period of one year.

17.All running on A/C bills shall be paid @ 95% of work value. The balance 5% shall be treated as retention money (other half) and will be Second part of Security deposit, Retention money will be refunded after issue of No defect certificate.

18.For execution of Agreement you are requested to submit a non judicial stamp paper of **Rs.500/-** detailed time and construction programme chart in consultation with engineer in-charge as per clause no. 4.08 of general terms and conditions. You are requested to attend the office of the undersigned immediately for signing work order after deposition of Performance Security.

19.You will have to produce the license as per contract labour (Regulation & Abilities) Act 1970. You will have to make labour payment as per minimum wages Act in presence of the authorized representative of the management. You have to submit labour payment certificate along with each on a/c and final bills.

20.The rates quoted by bidder shall be inclusive of all taxes, duties, Contractors' share of CMPF/EPF for labour component & levies but excluding GST & GST Compensation Cess, if applicable.

For, Shedame Construction

Proprietor

28/11/17

21. The payment to the Contractor's labour has to be made through Bank only.

22. Bonus is to be paid to the Contractor workers engaged by the Contractors as per the provision of Payment of Bonus Act 1965.

23. The Contractors shall register themselves on the Contract Labour Payment Management Portal (CLPi .P) of CIL within 30 days of issue of work order in case the Contract period is more than 30 days & within a period of 07 days in case the contract period is less than 30 days and will have to enter and update periodically the following details in the Portal: -

a) Work Order Details.

b) Contractor's workers details and wages payment details & deduction details in respect of each work order.

24. PAYMENT OF EX-GRATIA OF RS. 15.00 LAKH TO THE DEPENEDENT OF DECEASED CONTRACTOR'S WORKERS IN CASE OF MINE ACCIDENT CERTIFIED BY DGMS.

"The Contractor shall directly pay the ex-gratia amount of Rs.15.00 Lakhs to the same dependent family members of the deceased contractor's worker, who died in mine accident as certified by DGMS to whom the statutory benefits under Employee Compensation Act, Provident Fund etc. have been paid a per the terms of contract or through insurance company by availing Group Personnel Accident Insurance Policy for all its worker before commencement of the Contract, which shall be renewed periodically to cover the entire duration of the contract. No reimbursement shall be made on this account by CIL/Subsidiaries.

In order to comply with the above provisions, contractor shall immediately on receipt of letter of acceptance/work order shall obtain group personal accident insurance in respect of all the workmen engaged in mining activities for payment of Rs.15.00 Lakhs in case of death in mine accident. A proof of such effect shall be produced to the satisfaction of the management before commencement of the work. However, the responsibility of payment of special relief/ex-gratia amount shall lie exclusively with the contractor.

If the contractor fails to disburse the special Relief/Exgratia within the due date, the subsidiary concerned may make the payment to eligible dependent as mentioned herein above, However, such amount shall be recovered from the Contractor from his dues either in the same and/or other subsidiaries/CIL.

25. You are requested to **Sub Ordinate Engineer (Civil)/SSA,** who is the engineer in charge, for taking up the work immediately.

All other terms & conditions incorporated in the tender document shall also be governing this award letter.

The time shall be essence of the contract & work shall be completed within the time allocated.

Yours faithfully

Staff Officer (Civil)
Ballarpur Area

Copy to: -

1. APM/BA. 2.SAM/SSA

3. AFM/BA- This has reference to B.C. No. BA/RB/E1424/115A/GL 41100019/ENV/EMP/OTHER-ENVIRONMENTAL /23-24 Dt.26.11.2023 for Rs.2942085/- Cost Centre – (WCL9243800).

4. Sub Ordinate Engineer(Civil)/SSA,.... To please confirm the date of commencement to prepare the Work Order/Agreement.

5. Asst. Labour Commissioner, 1st floor, Kamal Complex, Ramnagar, Chandrapur

r, Shedame Construction

Proprietor

Annexure – 41

Photos of bamboo Net Wind Barrier & other details, Sasti OC Mine

WATER IS LIFE
TAKE CARE OF LIFE.
वायु प्रदुषण बढ़ रहा हैं,
नयी बिमारियाँ ला रहा हैं.

To,
Shedame Constructions

WESTERN COALFIELDS LIMITED
OFFICE OF THE AREA GENERAL MANAGER,
SASTI TOWNSHIP. TAH. RAJURA DIST. CHANDRAPUR.

AGREEMENT NO.:-WCL/CGM/BA/CIVIL/C-462/23-24/AGMT.NO./38/2023-24.
1/2/2024

NAME OF WORK :- **"Erection of Bamboo net barrier along Coal transportation road near Sasti Village at Sasti Expansion OCM under Sasti Sub Area."**

NAME OF AGENCY ;- **Shedame Constructions,**

Radhakrishna Kunj, Tukum,

CHANDRAPUR

AWARDED VALUE :- **Rs.29,42,085.36** (Rupees twenty nine lakhs forty two thousand eighty five & paise thirty six) only **including GST.**

WORK ORDER REF.:- WCL/CGM/BA/CIVIL/C-462/23-24/752 DT.28.11.2023.

B.C.NO:-This has reference to B C.No:-BA/RB/BSA/E1424/115A/GL41100019/ENV/EMP/OTHER ENVIRONMENTAL/2023-24 DT.26.11.2023 FOR Rs.29,42,085/- (COST CENTER:- WCL9243800)

DATE OF COMMENCEMENT :- 20.12.2023

DATE OF COMPLETION ;- .17.02.2024.

For, Shedame Construction

Proprietor

1/2/24

(5)

Under Jurisdiction of Nagpur Court Only "

OFFICE OF THE GENERAL MANAGER
Civil Department, AHQ, Ballarpur area
WESTERN COALFIELDS LIMITED
A Miniratna Company
(A Subsidiary of Coal India Limited)

Post. Sasti-(Rajura) Pin-442706, Dist. Chandrapur (M.S).
Mob-8275968274, 8275968514
email Id:-soccivil.wclba@gmail.com, website:- http://www.westerncoal.in

Ref. No. WCL/CGM-BA/Civil/C-462/23-24/ 752 **Date:-** 28/11/2023

To,
Shedame Constructions,
Radhakrishna Kunj, Tukum,
CHANDRAPUR

E-mail ID:-shedameconstructions@gmail.com
Mobile no. -9158358777

Subject: -LOA for the work of: "Erection of Bamboo net barrier along coal transportation road near Sasti Village at Sasti Expansion OCM under Sasti Sub Area."

Ref.: -1. Your bid against NIT no. ba3650-civ-e114-2023-24/655 Dt.28.10.2023
Tender ID no. 2023_WCL_292280_1.

Dear Sir

With reference to the above, this is to inform you that the above-mentioned work is hereby awarded to you for a total value of **Rs.24,93,292.68** (Rupees twenty four lakhs ninety three thousand two hundred ninety two & sixty eight paisa) only without GST. The GST Tax component is **Rs.4,48,792.68,** The breakup of quoted amount is as given below.

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or, Shedame Construction
Proprietor

28/11/23

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For, Shedame Construction

Proprietor

28/11/17

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25. You are requested to **Sub Ordinate Engineer (Civil)/SSA,** who is the engineer in charge, for taking up the work immediately.

All other terms & conditions incorporated in the tender document shall also be governing this award letter.

The time shall be essence of the contract & work shall be completed within the time allocated.

Yours faithfully

8/11/23

Staff Officer (Civil)
Ballarpur Area

Copy to: -

1. APM/BA. 2.SAM/SSA

3. AFM/BA- This has reference to B.C. No. BA/RB/E1424/115A/GL 41100019/ENV/EMP/OTHER-ENVIRONMENTAL /23-24 Dt.26.11.2023 for Rs.2942085/- Cost Centre – (WCL9243800).

4. Sub Ordinate Engineer(Civil)/SSA,.... To please confirm the date of commencement to prepare the Work Order/Agreement.

5. Asst. Labour Commissioner, 1st floor, Kamal Complex, Ramnagar, Chandrapur

r, Shedame Construction

Proprietor

Annexure – 42

Photos of Water Storage Ponds, Sasti OC Mine

Annexure – 43

Photos of Digital Library in Dhuptala Village constructed under CSR Activities

YEARLY REPORT OF MINE CLOSURE ACTIVITIES

(As per para 4.13 of O.M. dated 31.01.2025 of the Guidelines for preparation of Mine Closure Plan, No. 34011/28/2019-CPAM dated 31.01.2025 to be submitted before 1st July of every year)."

To,
The Coal Controller,
Office of the Coal Controller,
1, Council House Street,
Kolkata – 700 001.

Dated : 30/06/2025

Sir,

Please find herewith the yearly report of Mine Closure Activities for the year 2024-25 for the Sasti OC Mine of Western Coalfields Limited as given below :-

<table>
<tr><td>1</td><td>Name of the coal / lignite mine / block :</td><td>Sasti Opencast Mine</td></tr>
<tr><td></td><td>a) Type : OPC / UG / Mixed</td><td>OPC</td></tr>
<tr><td></td><td>b) Total life of the mine as per PR :</td><td>11 years</td></tr>
<tr><td></td><td>c) Balance life of the mine as per approved MCP:</td><td>10 years as per approved MCP</td></tr>
<tr><td></td><td>Present status of mine</td><td>Operational</td></tr>
<tr><td></td><td>Status of submission of Final Mine Closure Plan</td><td>NA. Operational mine</td></tr>
<tr><td>2</td><td>Name and address of the owner :</td><td>Shri Anil Kumar Singh , Director (Tech.) Operation, Civil Lines, WCL HQ., Nagpur.</td></tr>
<tr><td>3</td><td>Location of Lease Area:</td><td>Project : Sasti OCM
Area: Ballarpur Area.
Latitude : Between19°49'55" and19°49'05" N 19°49'05"
Longitude: Between 79°18'20" and79°19'30" E</td></tr>
<tr><td>4</td><td>i) Leasehold Area of the Mine as per approved MCP :
ii) Project Area of the Mine as per approved MCP:

iii) Type of the lease Area (Forest/Non-Forest)</td><td>1120.48 Ha

1120.48 Ha

<table><tr><td>Sr no.</td><td>Land Use</td><td>Area (Ha)</td></tr><tr><td>1</td><td>Forest</td><td>Nil</td></tr><tr><td>2</td><td>Agriculture</td><td>1085.98</td></tr><tr><td>3</td><td>Govt. Land</td><td>34.5</td></tr></table></td></tr>
<tr><td>5</td><td>Mine Closure Plan approved by _____ on (date) :</td><td>WCL Board on 28.01.2013
Revised on 01.08.2023</td></tr>
<tr><td></td><td>Date of Execution of Escrow agreement</td><td>20.03.2014</td></tr>
<tr><td></td><td>Date of execution of revised Escrow agreement</td><td>-</td></tr>
<tr><td></td><td>Date of execution of revised Escrow agreement along with reason for revision</td><td>Proposal sent to CCO on 01.01.2024</td></tr>
</table>

6	Escrow account number	08973161002874 0897107600002105
7	Name & address of Escrow Agent :	Punjab National Bank, Jaripatka, Nagpur- 440016
8	Annual Closure Cost deposited for the year 2024-25	Rs. 4,01,46,000/-
	Closure Cost deposited prior to 2024-25	Rs. 89,79,82,180.00/-
9	Progressive Balance including interest in the Escrow a/c (As on 31.03.2025)	Rs 102,92,47,269.64/-
10	Report being submitted for period	01.04.2024 to 31.03.2025
11	Specific condition imposed if any	None
12	Reserves of Coal / Lignite (as per Mining Plan): Coal / Lignite actually mined out during last year 24-25:	24.12 MT 2.05 ~~1.889~~ MT
13	Method of mining	Opencast
14	Area Mined out (Ha) : (Cumulative) In 2024-25	371.015 Ha. 3.50 Ha.
15	Area reclaimed : Cumulative in 24-25	Tech – 20.75 Ha. Bio – 20.75 Ha. Tech – Nill Bio – Nill
16	Details of Afforestation (Cumulative) : In 2024-25	5.40 lakh nos Nil

Sr no.	Type of Land	Nos.
1	OB Dump	326325
2	Plain	93250
3	Avenue	4000
4	Others	116925
	TOTAL	540500

17	Water Bodiesavailable in Leasehold area	None
	Details of Water Quality Management :	Water quality is being monitored by CMPDIL, Nagpur every fortnight. All the parameters like pH, COD, TSS, Oil & Grease are with in limits. The activities taken up for water quality management during the FY 2024-25 are as follows:

Sl no.	Name of Work
1.	Renovation at Aerators of DETP
2	Regular cleaning of STP
3	Regular cleaning of Sedimentation tank
4	Regular cleaning of ETP

	Qunatity of water pumped	6490 m³/day
	Quality of water	Within norms
	Corrective measure taken confirting to permissible limit	Quality of water is well within permissible limits
	Is there any acid mine drainage	NO
18	Existing Air Quality Parameters	SPM, PM_{10}, $PM_{2.5}$, SO_2, NO_X

	Details of Air Quality Management :	Air quality is being monitored by CMPDIL, Nagpur every fortnight. All the parameters like SPM, PM_{10}, $PM_{2.5}$, SO_2, NO_x are with in limits. The activities taken up for air quality management during the FY 2024-25 are as follows: Sl no. | Name of Work 1 | Sprinkling of water through mobile tankers over Coal transportation roads and Haul roads
19	Waste Management	
	a) Quantity of Overburden Removal (Annual 2024-25) :	Year | Contractual | Departmental 2024-25 | 22.787 Mm^3 | 1.842 Mm^3
	b) Quantity of Coal / Lignite reject generated :	-
	c) Utilization of Waste Material done :	Backfilling
	d) Protective Measures taken for prevention of siltation, erosion and dust generator for waste material :	Plantation, Spraying of water by mobile tankers. Garland drains are provided.
	e) Quantity of waste material re-handled / back-filled :	Year | Contractual | Departmental 2024-25 | 22.787 Mm^3 | 1.842 Mm^3
	f) Height of dump and its stability measures taken :	40-80 mtrs
	g) After backfilling if left out area is filled with water or not (at the time of final closure)	63 Ha as per EC
20	Top Soil Management in FY 2024-25	3.390 Mm^3
	a) Top Soil available at site :	2.739 Mm^3 [progressive]
	b) Utilization of the top soil during the year 2024-25	3.390 Mm^3
21	Details of Coal Beneficiation facilities adopted :	Coal Handling Plant is in operation for this mine.
	Maintanance of Coal washeries	NA
	Dismanteling of strucure of washeries	NA
22	Subsidence Management (for UG Mine) :	NA
23	infrastructure: Existing and its Future Utilization & Maintenance: (Roads, Aerial Ropeways, Conveyer Belts, Railways, Bridge, Culverts, Power lines, Buildings & Structures, Water Treatment Plant, Water Supply Sources, Gas Pipeline, Sewer Line, Telephone Cables, Underground Tanks, Electric Cable, Transformers etc.)	Existing infrastructure | Future Utilization | Maintanance Roads | -- | -- Aerial Ropeways | -- | -- Conveyor Belts | -- | -- Railways | -- | --

<table>
<tr><td></td><td></td><td>Bridge, Culverts</td><td colspan="2">–</td><td>–</td></tr>
<tr><td></td><td></td><td>Powerlines</td><td colspan="2">–</td><td>–</td></tr>
<tr><td></td><td></td><td>Building& Structures</td><td colspan="2"><table>
<tr><th>Sr</th><th>Infrastructure</th><th>no</th></tr>
<tr><td>1</td><td>R C Office</td><td>1</td></tr>
<tr><td>2</td><td>Substation</td><td>2</td></tr>
<tr><td>3</td><td>Pump house</td><td>1</td></tr>
<tr><td>4</td><td>ETP</td><td>2</td></tr>
<tr><td>5</td><td>Sedimentation tank</td><td>1</td></tr>
<tr><td>6</td><td>Dumper shed</td><td>1</td></tr>
<tr><td>7</td><td>Store</td><td>1</td></tr>
<tr><td>8</td><td>Canteen</td><td>1</td></tr>
<tr><td>9</td><td>Area Workshop</td><td>1</td></tr>
<tr><td>10</td><td>Toilets</td><td>1</td></tr>
<tr><td>11</td><td>Diesel Pump</td><td>1</td></tr>
<tr><td>12</td><td>Washing ramp</td><td>1</td></tr>
<tr><td>13</td><td>Shovel shed</td><td>1</td></tr>
<tr><td>14</td><td>Cycle stand</td><td>1</td></tr>
</table></td><td></td></tr>
<tr><td></td><td></td><td>Water Treatment Plant</td><td colspan="2">1 no. ETP and sedimentation tank</td><td></td></tr>
<tr><td></td><td></td><td>Water Supply Sources</td><td colspan="2">–</td><td>–</td></tr>
<tr><td></td><td></td><td>Gas pipeline</td><td colspan="2">–</td><td>–</td></tr>
<tr><td></td><td></td><td>Sewer Line</td><td colspan="2">–</td><td>–</td></tr>
<tr><td></td><td></td><td>Telephone Cable</td><td colspan="2">–</td><td>–</td></tr>
<tr><td></td><td></td><td>Underground Tanks</td><td colspan="2">–</td><td>–</td></tr>
<tr><td></td><td></td><td>Electric Cable</td><td colspan="2">–</td><td>–</td></tr>
<tr><td></td><td></td><td>Transformer</td><td colspan="2">–</td><td>–</td></tr>
<tr><td>24</td><td><u>Disposal of Machinery :</u> Decommissioning of Mining Machinery and their possible post mining utilization :</td><td colspan="4">Mine is under operation. After closure of mine.
List of HEMM Summary is a below:
PC = 4 nos.
Dozer = 7 nos.
Dumper – 22 nos.
Tanker – 2 nos.
Drill – 4 nos.
Grader – 2 nos.</td></tr>
</table>

		Diesel Bowser – 1 nos. HEMM which can be used , will be transferred to adjacent mine and rest will be grounded/ survey off.
25	Safety and Security :	
	a) Safety measures implemented to prevent access to surface opening for UG working (barbed wire fencing done) :	NA
	b) Safety measures implemented to prevent access to surface opening for excavation (OPC) :	Embankment of about 3 km length
	c) Arrangement made up to the site being opened for general public :	NA
	d) Sealing of mine entries :	NA
26	Economic Repercussions of Closure of Mine :	
	a) Number of local residents employed in the mine :	647 nos as on 31.03.2025 [progressive] As on date, mine is operational. Locals employed in the mine (departmental manpower) will be shifted to other mines/ area when the mine will be closed. Similarly, Contractual manpower will also be utilized by Civil, E&M, HoE contractor in the other mines of Area. Hence no economic repercussion on these locals
	b) Compensation given to the employees concerning their sustenance :	Since, mine is still operational, none of the manpower is transferred or removed. Hence, not applicable. After closure also, Local peoples employed in the mine will be shifted to nearby mines or other offices of WCL.
	c) Vocational / Skill development training for sustainable income of affected people :	NA

27. Date of Submission of Half yearly report: 30.06.2025
28. Any other closure activities as per approved Mine Closure Plan:
29. Post Environmental Monitoring for 03 Years (to be given after closing of mine):
30. Mine Closure Activities performed during the year: The information in the format attached at Annexure-A.
31. Description of OB Handling: The information in the format attached at Annexure-B.
32. Details of Compliances made in accordance with observations of OSD, CCO: NA

The above information given is true to the best of my knowledge.

30.6.25
Mine Manager
Sasti OC Mine

30/6/25
Sub Area Manager
Sasti Sub Area

30/6/25
Area General Manager
Ballarpur Area

Area Nodal Officer (Envt.)
Ballarpur Area, WCL

Sr. Manager (Min.) / Env.
WCL-HQ

General Manager (Env.) / HOD
WCL, HQs. Nagpur

ANNEXURE 46

PHOTO OF HIGH MAST SOLAR LIGHTS IN VILLAGES

Annexure – 47

Photos of Bio Toilet, Sasti OC Mine

SOP for allocation of Mines for Fly Ash filling (Both UG/OC)

SOP for allocation of Mines for Ash filling

As per MoEFFC notification on 3rd November 2009, "fly ash" means and includes all categories or groups of coal or lignite ash generated at the thermal power plant and collected by Electrostatic Precipitator (ESP) or bag filters or other similar suitable equipments; bottom ash is the ash collected separately at the bottom of the boiler; pond ash is the mixture of ESP Fly ash and bottom ash, but, for the purpose of this notification, ***the term "fly ash" means and includes all ash generated such as Electrostatic Precipitator (ESP) ash, dry fly ash, bottom ash, pond ash and mound ash as the objective is to utilise all the ashes****.*

1. As per the Central Level Working Group (CLWG) deliberations, the following mines shall be considered for allotment for the purpose of fly ash filling/stowing:

i. Closed or abandoned open cast mines.
ii. Closed or abandoned voids of the working open cast mines.
iii. Closed underground mine or working underground mine where the proposed extraction of coal is by stowing method.

2. The coal companies shall identify the mines that are suitable/available for the disposal of fly ash and the mines that will be available in the next 03 years. The Coal companies (CIL/SCCL/NLC) shall compile the list of suitable/ available/ to be available mines and share the list of the mines so identified, with the Ministry of Coal by 10th of every month. In case no mines are available to be offered, a NIL report shall be sent.

3. The TPPs shall identify the suitable mines and make their requests for the allocation of the respective mine for the purpose of fly ash filling to the Central Electricity Authority (CEA). The format for the application to CEA is attached as Annexure 1. The requests shall be sent to CEA by 10th of every month.

4. CEA shall examine, compile and forward the requests to the Ministry of Coal along with its comments on the same.

5. For the request made by the TPPs for the allocation of Captive/commercial coal blocks allotted by the Ministry of Coal, a copy of the request shall also be sent to the Ministry of Coal for examining the same with the concerned coal block owner.

6. A Central Level Working Group (CLWG) meeting shall be organized by the Ministry of Coal on or after 20th of every month for the purpose of allocation of the mines to TPPs to dispose the fly ash.

7. The thermal power plants that have been allotted mines for the disposal of fly ash shall have responsibilities, with respect to safety related to

environment, transport and other administrative-related matters as per **Annexure-2**.

8. The Coal Companies shall have the responsibilities as specified in the **Annexure-3** for the safe disposal of fly ash and other administrative-related matters.

9. In case where the mine and TPP belong to the same owner, there shall be no need for the allocation by CLWG.

10. MoU shall be concluded by the Coal company and the TP within 3 months of publication of the minutes having the allocation of the same, failing which, the same shall be deemed cancelled and will be considered for further allocation, unless the request for extension is agreed by the Chairman, CLWG.

Annexure1

Format of the request to CEA by TPPs for the allocation of the Mines

A	**List of Identified mines:**						
	Name of the TPP	Name of the mines	Distance (km)	Void space available	Void space required (L cum.)	Tentative time required for dumping	Proposed mode of transport
1.							
2.							
3.							
.							
.							
.							
	Total void space available/required					--	--
C.	**Details of past allotments to the company**						
	Name of the TPP	Name of the mines	Date of allotment	Status of MoU and operation		Remarks	
1.							
2.							
3.							
.							
.							
D	**Suggestions/grievances etc.**						

Annexure 2

Responsibilities of TPPs

i. All the regulatory compliances, safety and environmental & operational issues associated with fly ash disposal into mine voids will rest with the TPPs.

ii. TPPs should do scientific study as per OM dated 28.08.2019 issued by MoEF&CC and CPCB guidelines and amendment thereof. The TPPs should obtain NoC from concerned State Pollution Control Boards.

iii. The TPPs shall be responsible for complying with the requirements of OM dated 28.08.2019 issued by MoEF&CC including. However, if need arises to obtain requisite permission from DGMS, the Coal Companies shall, on behalf of the TPPs apply for the same at DGMS but the follow up works shall be done by the TPPs. Transport, handling and disposal of ash to prevent surface and sub surface water pollution shall be the sole responsibility of TPPs.

iv. Fly ash disposal & monitoring shall be as per OM dated 28.08.2019 issued by MoEF&CC by TTP on regular basis. In case of any adverse impact, the fly ash filling shall be stopped and appropriate remediation measures shall be taken.

v. The closure of the mine void site after fly ash disposal up to permitted height should be associated with blanketing with top soil as per study but not less than minimum 30 cms thickness and ecological restoration of the site through suitable landscaping and plantation of native species.

vi. Alternatively, installation of ground mounted solar or other re-purposing activities may be explored.

vii. During post-closure, garland drains should be provided around the site to ensure that there is no ingress of water into the disposal site.

viii. In the case of UG mines submission of details for design, drawing location etc. of the Stowing plant will be assisted by the mine owner. The cost of supply, erection and commission of the Stowing plant, borehole as well as the cost of laying pipelines and other infrastructure

for the fly ash filling purpose both above & below ground shall be borne by TPPs.

ix. The reclamation of filled in mine site and post closure monitoring shall be done by TPPs accordance with the directive issued by MoEFCC vide O.M. dated 29/08/2019 before handing over the site to coal transportation.

x. TPPs in consultation with the Coal Companies shall prepare a Hazard identification and Safety Management plan.

xi. Scientific studies, if required, shall be done in consultation with the Coal Companies before commencement of fly ash filling and all the recommendation made in the scientific study shall be complied with. The monitoring shall be carried out for at least for two monsoon seasons after completion of fly ash filling in the OC voids.

xii. Monitoring by TPPs or agencies for entire ash disposal operation, conducting different studies and maintaining all records as prescribed, are to be certified by concerned coal company as per OM of MoEFCC dated 28.8.2019. After closure of the site, it shall be ensured by TPPs that the disposal site has been suitably reclaimed through plantation of native tree species and other measures in accordance with the prescribed guidelines/statutes.

xiii. In case of any adverse report/notice by the regulatory agency for the non-compliance/damage to environment, the mine owner shall have liberty to cancel the MoU and stop the fly ash operations. Fly ash filling will resume after mitigation measures are taken and clearance from the regulatory authority is obtained.

xiv. Since the Coal Companies remain the custodians of the land as per CB Act, 1957, the liability in terms of legal, environmental and safety issues shall lie with the TPPs, in accordance with the mutually agreed MoU, starting from preparation of the site and fly ash disposal up to the time of closure of the site.

xv. Lease rent which has been paid to the State Government by Coal Companies is to be recovered from TPPs. Further policy guidelines for the use of land acquired under the Coal Bearing Areas (A&D) Act, 1987, vide MoC OM no. 43022/1/2020-LAIR dt: 22-04-2022 may be followed.

xvi. The guidelines issued by MOC regarding responsibility of mine owners and TPPs after the site is handed over to TPPs for fly ash disposal, shall apply.

Annexure 3

Responsibilities of the Coal Companies

i. The Coal Companies shall examine all the clearances, studies and permissions obtained by the Thermal Power Plant vis-à-vis OM dated 28.8.2019 by MoEF&CC and various decisions taken in the Fly Ash Management and Utilisation Mission meeting organized from time to time by MoEF&CC. If found satisfactory, coal companies will communicate to the concerned TPP or agency to enter into a MoU and also related formalities for the disposal of fly ash.

ii. In the case of working UG mine, the concerned subsidiary of Coal Company/ Coal company shall be associated with TPPs for all the works below the surface (laying of pipelines, barricading etc). For the closed/old underground workings, the coal company shall facilitate the TPPs for drilling of boreholes and laying of surface pipeline for filling of fly ash slurry.

iii. The guidelines issued by MOC regarding responsibility of mine owners and TPPs after the site is handed over to TPPs for fly ash disposal, shall apply.

ANNEXURE 49

SASTI OC MINE

LNG DUMPERS PHOTOS

REPORT ON

MONITORING OF GROUND WATER LEVEL

OF

SASTI OC EXPN. MINE.

BALLARPUR AREA

(M.S)

WESTERN COALFIELDS LTD.

PERIOD- MAY 2025 (PRE MONSOON)

M/s Anacon Laboratories Pvt. Ltd., Nagpur

MoEF&CC (GOI) 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

2025-26

Certificate

Groundwater level monitoring has been conducted with due diligence, and a comprehensive report on the monitoring of groundwater levels in all observation wells has been prepared as per the scope of work outlined in work order no. वेकोलि/मुख्यालय/पर्यावरण/14-L/1122-1148, dated 19.04.2025 for the May 2025 (Pre-monsoon) Period.

The report includes the monitoring of groundwater levels and water quality analysis of observation wells pertaining to the SASTI OC EXPN. Mine in the Ballarpur Area of Chandrapur District, Maharashtra.

The groundwater level monitoring was meticulously carried out by Anacon Laboratories Pvt. Ltd., and the analysis of the samples was performed by Anacon Laboratories Pvt. Ltd., a NABL Accredited Laboratory. (NABL Certificate no. TC-12998)

Anacon Laboratories Pvt. Ltd. gratefully acknowledges the full cooperation rendered by the concerned WCL officials, which facilitated the timely completion of the project.

Krupali Raut
(Geologist)

Gyanchand Bohra
NABET Accredited EIA Expert
for Hydrogeology & Geology

ANACON LABORATORIES PVT. LTD. NAGPUR

Nagpur
May-2025

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

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I-TABLE	**SASTI OC EXPN. MINE.**	**PERIOD- MAY 2025 (PRE MONSOON)**	8
Analysis Report	**SASTI OC EXPN. MINE.**	**Water Analysis Report**	13

ANACON LABORATORIES PVT. LTD. NAGPUR

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/1122-1148, dated 19.04.2025 for the May 2025 (Pre-monsoon) Period.

This Ground Water Level Monitoring report is prepared for SASTI OC EXPN. MINE of Ballarpur Area of WCL for 1 season i. e **PERIOD- MAY 2025 (PRE MONSOON)**. This mine is 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.

ANACON LABORATORIES PVT. LTD. NAGPUR

SASTI OC EXPN. MINE.

BALLARPUR AREA

WESTERN COALFIELDS LTD.

PERIOD- MAY 2025 (PRE MONSOON)

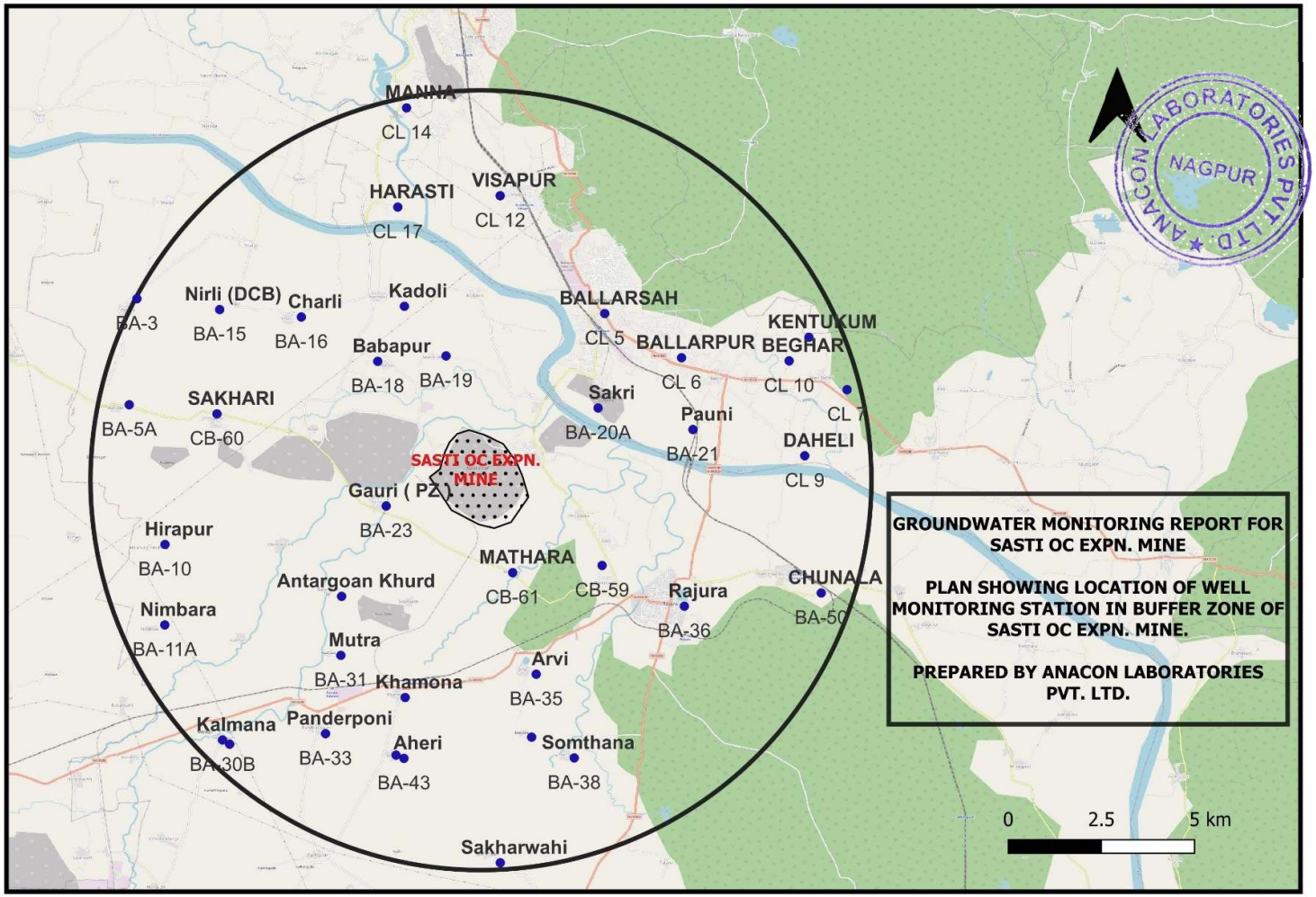

FIGURE VI: GROUND WATER MONITORING STATION (OBSERVATION WELLS IN AND AROUND OF SASTI EXPN. OC MINE)=

Table-I: Ground Water Level Monitoring Data from Dugwells/Piezometers in Buffer Zone of Sasti OC Expn., Ballarpur Area, WCL

SR.NO	Well No. BA	Name of village	Well location	Latitude	Longitude	R.L. in m	Well depth (m bmp)	Well dia (m)	Height of measuring point (m agl)	Depth to water level (m.bgl)		
										May-2025	UTILITY	G/F
1.	BA-3	Pelura (DCB)	Eastern side of the village near Mr. Krishna Amne home	19°51'26.4"	79°13'45.1''	189	9.81	3.21	0.97	6.1	Domestic	basalt
2.	BA-5A	Warora (DCB)	About 500 m NW of village in the field, near to cross road, 15 m N of the road.	19°49'48.5"	79°13'38"	185	12.47	2.56	0.76	6.5	Domestic	basalt
3.	BA-10	Hirapur	West of the village, outside in field	19°47'39.5"	79°14'11"	215	11.42	1.68	0.72	3.5	agriculture	laterite
4.	BA-11A	Nimbara	Northern edge of village, near to Primary School	19°46'25.2"	79°14'10.8"	249	8.66	2.14	0.71	5.4	agriculture	limestone
5.	BA-15	Nirli (DCB)	East side of village , about 20m west of the road to Didsi	19°51'16.4"	79°15'1.4''	229	15.45	2.84	0.41	6.5	agriculture	laterite
6.	BA-16	Charli	Near Bajarang Bali Mandir, Southern edge of the village	19°51'9.5"	79°16'16.7"	234	14.83	4.28	0.77	7.3	agriculture	basalt
7.	BA-17	Kadoli	East of village, outside near Mata mandir, 150 m S of Kadoli-Kolgaon Road	19°51'19.4"	79°17'51.7"	186	6.44	3.94	0.81	4.9	agriculture	laterite
8.	BA-18	Babapur	N of the village near the temple	19°50'28.6"	79°17'27.1"	187	7.33	2.88	0.89	5.2	agriculture	limestone

SR.NO	Well No. BA	Name of village	Well location	Latitude	Longitude	R.L. in m	Well depth (m bmp)	Well dia (m)	Height of measuring point (m agl)	Depth to water level (m.bgl)		
										May-2025	UTILITY	G/F
9.	BA-19	Manoli	E of the village near to Gram Panchayat office	19°50'33.6"	79°18'30.1"	191	9.26	2.31	0.71	6.1	agriculture	basalt
1(	BA-20A	Sakri	West of the village near to school	19°49'45.5"	79°20'50.3"	236	12.27	2.79	1.13	7.6	Domestic	limestone
1:	BA-21	Pauni	N edge of the village, about 70 m south of Gauri -Nandgaon road.	19°49'25.6"	79°22'17.7"	219	8.39	3.42	0.96	6.9	Domestic	basalt
1:	BA-23	Gauri (PZ)	About 200m east of the village, near to village road junction in agricultural field	19°48'15"	79°17'34.9"	188	9.68	3.15	0.76	5.8	Domestic	limestone
1:	BA-28A	Goigaon(Hand pump tw)	Ghyanvi Vidhate House	19°44'25"	79°17'44"	231	7.15	2.95	0.75	5.5	agriculture	laterite
1-	BA-29	Antargoan Khurd	NE side ,at the entrance of village	19°46'51.6"	79°16'53.8"	178	9.45	3.49	0.73	6.1	agriculture	laterite
1:	BA-30B	Kalmana	70 m S of village located in nalla bed, near temple	19°44'39"	79°15'4''	192	7.96	3.18	0.69	6.06	agriculture	basalt
1(	BA-31	Mutra	SW side of village, near to school	19°45'57.1"	79°16'53.1"	186	8.14	4.17	0.54	7	agriculture	laterite
1:	BA-32	Chandanvahi	West of the village, 50 m west of the village road, outside in field	19°44'35.1"	79°15'10.6"	215	7.19	2.73	0.19	6.4	agriculture	basalt

SR.NO	Well No. BA	Name of village	Well location	Latitude	Longitude	R.L. in m	Well depth (m bmp)	Well dia (m)	Height of measuring point (m agl)	Depth to water level (m.bgl)		
										May-2025	UTILITY	G/F
18	BA-33	Panderpon i	Centre of village, near Ganesh Krishi Kendra	19°44'44.8"	79°16'39"	205	13.88	2.88	0.45	6.2	agriculture	laterite
19	BA-34	Khamona	Northern side of the village(outside). About 120 m S of culvert on Rajura-Chandur road	19°45'18.2"	79°17'52.4"	171	11.42	4.65	0.67	7.9	agriculture	limestone
20	BA-35	Arvi	Northern side of village, adjacent to school compound.	19°45'39.7"	79°19'53.2"	176	9.14	1.96	0.83	7.7	agriculture	limestone
21	BA-36	Rajura	Near Bhgawani Mandir, 50 m south of Rajura- Awarpur road, near Nala Bridge	19°46'42.5"	79°22'9.8''	243	10.88	2.83	0.93	6.1	agriculture	laterite
22	BA-37	Botgaon (DCB)	Western side of the village, near Chaupal (imli tree)	19°44'41.6"	79°19'49"	217	9.42	2.76	0.56	8.1	Domestic	limestone
23	BA-38	Somthana	Near Panchayat office, center of the village	19°44'22.4"	79°20'28.3"	189	12.91	3.14	0.56	6.5	limestone	Domestic
24	BA-39	Sakharwah i	Centre of the village near Sri Tukdojee Maharaj Chowk	19°42'45.6"	79°19'20.1"	228	9.49	2.47	0.64	7.5	agriculture	basalt
25	BA-43	Aheri	Eastern side of village near Hanuman temple	19°44'22"	79°17'51.3"	178	10.45	2.19	0.76	6.8	Domestic	limestone

SR.NO	Well No. BA	Name of village	Well location	Latitude	Longitude	R.L. in m	Well depth (m bmp)	Well dia (m)	Height of measuring point (m agl)	Depth to water level (m.bgl)		
										May-2025	UTILITY	G/F
2(	BA-50	CHUNALA	At the entry point of Indira Nagar ward no.1	19°46'54.7"	79°24'16"	241	8.76	1.56	0.64	5.2	laterite	agriculture
2	CL 5	BALLARSAH	In church campus infront of Nagar Parishad	19°51'12.7"	79°20'56.4"	179	7.68	2.96	0.72	5.8	Domestic	basalt
2	CL 6	BALLARPUR	In the campus of Ice Sai Baba Factory Rajura Road	19°50'31.9"	79°22'7.2''	184	13.14	4.42	0.93	6.2	Domestic	basalt
2	CL 7	NAV DAHLI	Opposite Budha Vihar	19°50'2.4"	79°24'39.8"	196	8.84	2.83	0.24	5.9	agriculture	laterite
3	CL 9	DAHELI	In the village on west side	19°49'1.4"	79°24'0.8''	177	9.55	2.49	0.87	6.4	agriculture	laterite
3	CL 10	BEGHAR	In the Junction of Vahmini	19°50'29"	79°23'46.4"	226	11.39	3.24	0.61	8.1	agriculture	laterite
3	CL 11	KENTUKUM	Infront of Temple in the village	19°50'50.8"	79°24'4.6''	216	12.43	2.23	0.66	6.7	agriculture	laterite
3	CL 12	VISAPUR	Out of Campus of Zila School	19°53'1.5"	79°19'20"	195	18.93	3.91	0.91	7.7	Domestic	laterite
3	CL 17	HARASTI	In front of Hanuman temple	19°52'51"	79°17'45.6"	203	10.44	3.86	0.64	6.5	agriculture	basalt
3	CB-59	ADITYA NAGAR RAMPUR	CENTER OF THE VILLAGE NEAR CHOUDARY KIRANA STORE	19°47'20.11"	79°20'53.95''	220	10.6	4.8	0.4	5.90	domestic	basalt

SR.NO	Well No. BA	Name of village	Well location	Latitude	Longitude	R.L. in m	Well depth (m bmp)	Well dia (m)	Height of measuring point (m agl)	Depth to water level (m.bgl)		
										May-2025	UTILITY	G/F
3(	CB-60	SAKHARI	SOUTH 100M FROM PODE KIRANA STORE.	19°49'40.08"	79°14'58.92"	245	8.9	4.6	0.4	6.90	domestic	basalt
3	CB-61	MATHARA	NORTH-WEST 3OOM FROM VILLAGE, IN THE AGRICULTURE LAND.	19°47'13.49"	79°19'31.56"	205	9.6	4.2	0.3	7.10	agriculture	basalt
3	CL 14	MANNA	Inside village by side of house Bapuji Motghare	19°54'22.62"	79°17'53.69"	230	11.17	3.51	0.45	8.00	agriculture	laterite

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Anacon Laboratories

TC-12998

Test Report

ULR No.- TC129982500003751F
Test Report No.: ALPL/23062025/01-2 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-2 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	
Sample Description Ground Water	**Sample Details As Provided By Client** Ground Water (Ballarpur Area)	**Purpose of analysis** Drinking	**Quantity Received** 1 Ltr
Sampling By Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 21.05.2025 **Sampling Time** Not Mentioned	**Sampling Location** Pelura (DCB) (Well No.-BA-3)	
Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).			

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	186.4
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	116.55
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	**123.2**
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	27.70
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	8.60
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.34
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	48.25
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**704**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**422**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003751F
Test Report No.: ALPL/23062025/01 -2 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** **Inward Date** **Reference** **Inv. No.**	ALPL/110625/W-2/64-2 11.06.2025 WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 25	**Analysis Start** **Analysis End**	12.06.2025 23.06.2025	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date** / **Sampling Time**	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	21.05.2025 Not Mentioned	Pelura (DCB) (Well No.-BA-3)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.24
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report.● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification. ● LOQ= limit of quantification. ● Environmental condition – Satisfactory & Clear ● Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05). ● pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No.4, 12 & 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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TC-12998

Test Report

ULR No.- TC129982500003753F
Test Report No.: ALPL/23062025/01-4 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-4 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description Ground Water	**Sample Details As Provided By Client** Ground Water (Ballarpur Area)	**Purpose of analysis** Drinking	**Quantity Received** 1 Ltr
Sampling By Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 21.05.2025 **Sampling Time** Not Mentioned	**Sampling Location** Warora (DCB) (Well No.-BA-5A)	

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	119.17
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	122.08
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	**89.6**
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	18.95
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	5.45
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.67
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	33.53
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**674**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**302**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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ORIGINAL TEST REPORT

Test Report

ULR No.- TC129982500003753F
Test Report No.: ALPL/23062025/01-4 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-4	**Analysis Start**	12.06.2025
	Inward Date	11.06.2025	**Analysis End**	23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025		
	Inv. No.	25		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date**	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Time** 21.05.2025 Not Mentioned	Warora (DCB) (Well No.-BA-5A)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.27
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report ● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification. ● LOQ= limit of quantification. ● Environmental condition – Satisfactory & Clear ● Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05). ● pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No.4, 12 & 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------**END OF REPORT**----------

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TC-12998

Test Report

ULR No.- TC129982500003757F
Test Report No.: ALPL/23062025/01-8 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-8 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date** 22.05.2025 **Sampling Time** Not Mentioned	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01		Hirapur (Well No.-BA-10)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	136.2
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	179.56
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	**165.6**
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	**45.68**
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	10.58
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	6.93
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	65.63
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**952**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**602**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003757F
Test Report No.: ALPL/23062025/01-8 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-8 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description Ground Water	**Sample Details As Provided By Client** Ground Water (Ballarpur Area)	**Purpose of analysis** Drinking	**Quantity Received** 1 Ltr
Sampling By Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 22.05.2025 **Sampling Time** Not Mentioned	**Sampling Location** Hirapur (Well No.-BA-10)	
Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)			

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.20
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report.● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification. ● LOQ= limit of quantification. ● Environmental condition – Satisfactory & Clear ● Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05). ● pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No. 4, 7, 12 & 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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TC-12998

Test Report

ULR No.- TC129982500003758F
Test Report No.: ALPL/23062025/01-9 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-9	**Analysis Start**	12.06.2025
	Inward Date	11.06.2025	**Analysis End**	23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025		
	Inv. No.	25		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 22.05.2025 **Sampling Time** Not Mentioned	Nimbara (Well No.-BA-11A)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	102.15
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	109.73
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	51.2
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	23.81
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	8.18
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.37
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	32.39
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	402
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**226**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003758F
Test Report No.: ALPL/23062025/01-9 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-9 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description Ground Water	**Sample Details As Provided By Client** Ground Water (Ballarpur Area)	**Purpose of analysis** Drinking	**Quantity Received** 1 Ltr
Sampling By Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 22.05.2025 **Sampling Time** Not Mentioned	**Sampling Location** Nimbara (Well No.-BA-11A)	
Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)			

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.22
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

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REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No. 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

----------**END OF REPORT**----------

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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TC-12998

Test Report

ULR No.- TC129982500003761F
Test Report No.: ALPL/23062025/01-12 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-12 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25		**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 22.05.2025 **Sampling Time** Not Mentioned	Nirli (DCB) (Well No.-BA-15)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	102.15
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	119.23
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	47.2
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	23.32
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	6.82
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.57
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	19.66
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	308
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**214**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003761F
Test Report No.: ALPL/23062025/01-12 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-12 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date** 22.05.2025 **Sampling Time** Not Mentioned	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01		Nirli (DCB) (Well No.-BA-15)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.36
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

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REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No. 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

----------END OF REPORT----------

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

ORIGINAL TEST REPORT

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Anacon Laboratories

TC-12998

Test Report

ULR No.- TC129982500003762F
Test Report No.: ALPL/23062025/01-13 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-13 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25		**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 22.05.2025 **Sampling Time** Not Mentioned	Charli (Well No.-BA-16)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	136.2
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	142.98
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	**171.2**
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	**46.17**
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	10.62
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.13
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	51.10
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**1021**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**618**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003762F
Test Report No.: ALPL/23062025/01-13 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-13 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 22.05.2025 **Sampling Time** Not Mentioned	Charli (Well No.-BA-16)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	BLQ(LOQ-0.02)
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report.● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification. ● LOQ= limit of quantification. ● Environmental condition – Satisfactory & Clear ● Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05). ● pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No.4, 7, 12 & 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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TC-12998

Test Report

ULR No.- TC129982500003763F
Test Report No.: ALPL/23062025/01-14 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-14 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date** 22.05.2025 **Sampling Time** Not Mentioned	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01		Kadoli (Well No.-BA-17)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	130.52
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	149.63
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	**97.6**
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	**39.85**
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	9.90
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.63
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	46.54
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**816**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**408**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003763F
Test Report No.: ALPL/23062025/01-14 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-14 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date** 22.05.2025 **Sampling Time** Not Mentioned	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01		Kadoli (Well No.-BA-17)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.09
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report. ● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification. ● LOQ= limit of quantification. ● Environmental condition – Satisfactory & Clear ● Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05). ● pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No.4, 7, 12 & 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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TC-12998

Test Report

ULR No.- TC129982500003764F
Test Report No.: ALPL/23062025/01-15

Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-15 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date** 23.05.2025 **Sampling Time** Not Mentioned	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01		Babapur (Well No.-BA-18)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	141.87
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	80.28
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	46.4
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	16.03
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	4.61
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.37
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	20.32
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	296
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	182
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003764F
Test Report No.: ALPL/23062025/01-15 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-15 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date** 23.05.2025 **Sampling Time** Not Mentioned	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01		Babapur (Well No.-BA-18)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.20
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report. ● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification. ● LOQ= limit of quantification. ● Environmental condition – Satisfactory & Clear ● Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05). ● pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is complying with IS 10500(2012).**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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TC-12998

Test Report

ULR No.- TC129982500003765F
Test Report No.: ALPL/23062025/01-16 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-16 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25		**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 23.05.2025 **Sampling Time** Not Mentioned	Manoli (Well No.-BA-19)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	73.77
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	68.87
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	68
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	24.78
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	4.61
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.92
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	48.25
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	416
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**276**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Sneha Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003765F
Test Report No.: ALPL/23062025/01-16 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-16	**Analysis Start**	12.06.2025	
	Inward Date	11.06.2025	**Analysis End**	23.06.2025	
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025			
	Inv. No.	25			

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 23.05.2025 **Sampling Time** Not Mentioned	Manoli (Well No.-BA-19)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.12
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report.● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification.** ● **LOQ= limit of quantification.** ● **Environmental condition – Satisfactory & Clear** ● **Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05).** ● **pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the test Sr. No. 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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Test Report

ULR No.- TC129982500003766F
Test Report No.: ALPL/23062025/01-17 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-17	**Analysis Start**	12.06.2025
	Inward Date	11.06.2025	**Analysis End**	23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025		
	Inv. No.	25		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 23.05.2025 **Sampling Time** Not Mentioned	Sakri (Well No.-BA-20A)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	107.82
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	117.33
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	53.6
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	22.35
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	4.61
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.64
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	30.58
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	397
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**226**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003766F
Test Report No.: ALPL/23062025/01-17 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-17 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description Ground Water	**Sample Details As Provided By Client** Ground Water (Ballarpur Area)	**Purpose of analysis** Drinking	**Quantity Received** 1 Ltr
Sampling By Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 23.05.2025 **Sampling Time** Not Mentioned	**Sampling Location** Sakri (Well No.-BA-20A)	

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.48
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

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REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the test Sr. No. 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

----------END OF REPORT----------

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003767F
Test Report No.: ALPL/23062025/01-18 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-18	**Analysis Start**	12.06.2025
	Inward Date	11.06.2025	**Analysis End**	23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025		
	Inv. No.	25		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 23.05.2025 **Sampling Time** Not Mentioned	Pauni (Well No.-BA-21)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	102.15
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	69.82
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	54.4
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	19.92
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	4.82
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.54
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	18.42
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	310
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**218**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003767F
Test Report No.: ALPL/23062025/01-18

Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-18 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date** 23.05.2025 **Sampling Time** Not Mentioned	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01		Pauni (Well No.-BA-21)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.45
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report. ● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification.** ● **LOQ= limit of quantification.** ● **Environmental condition – Satisfactory & Clear** ● **Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05).** ● **pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the test Sr. No. 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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Test Report

ULR No.- TC129982500003768F
Test Report No.: ALPL/23062025/01-19

Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-19 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description	Sample Details As Provided By Client	Purpose of analysis	Quantity Received
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	Sampling Date / Sampling Time	Sampling Location
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	Sampling Date 23.05.2025 Sampling Time Not Mentioned	Gauri (PZ) (Well No.-BA-23)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	104.03
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	122.08
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	54.4
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	**41.31**
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	10.49
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.54
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	65.44
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**849**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**426**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garwal
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003768F
Test Report No.: ALPL/23062025/01-19 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-19	**Analysis Start**	12.06.2025
	Inward Date	11.06.2025	**Analysis End**	23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025		
	Inv. No.	25		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 23.05.2025 **Sampling Time** Not Mentioned	Gauri (PZ) (Well No.-BA-23)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.33
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report.● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification. ● LOQ= limit of quantification. ● Environmental condition – Satisfactory & Clear ● Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05). ● pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No.7, 12 & 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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Anacon Laboratories

TC-12998

Test Report

ULR No.- TC129982500003770F
Test Report No.: ALPL/23062025/01-21

Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-21	**Analysis Start** 12.06.2025
	Inward Date	11.06.2025	**Analysis End** 23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025	
	Inv. No.	25	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 23.05.2025 **Sampling Time** Not Mentioned	Goigaon (Hand pump tw) (Well No.-BA-28A)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	85.12
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	134.90
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	28
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	12.63
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	5.24
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.36
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	20.13
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	304
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	122
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003770F
Test Report No.: ALPL/23062025/01-21 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-21	**Analysis Start** 12.06.2025
	Inward Date	11.06.2025	**Analysis End** 23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025	
	Inv. No.	25	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 23.05.2025 **Sampling Time** Not Mentioned	Goigaon (Hand pump tw) (Well No.-BA-28A)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.09
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report ● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification. ● LOQ= limit of quantification. ● Environmental condition – Satisfactory & Clear ● Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05). ● pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only**. Sample bearing the details mentioned as above is complying with IS 10500(2012).**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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TC-12998

Test Report

ULR No.- TC129982500003771F
Test Report No.: ALPL/23062025/01-22 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-22 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	
Sample Description Ground Water	**Sample Details As Provided By Client** Ground Water (Ballarpur Area)	**Purpose of analysis** Drinking	**Quantity Received** 1 Ltr
Sampling By Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 23.05.2025 **Sampling Time** Not Mentioned	**Sampling Location** Antargaon Khurd (Well No.-BA-29)	
Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).			

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	136.2
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	134.90
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	**155.2**
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	11.66
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	9.83
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.58
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	51.67
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**713**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**436**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garwal
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003771F
Test Report No.: ALPL/23062025/01-22 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-22	**Analysis Start** 12.06.2025
	Inward Date	11.06.2025	**Analysis End** 23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025	
	Inv. No.	25	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 23.05.2025 **Sampling Time** Not Mentioned	Antargaon Khurd (Well No.-BA-29)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	BLQ(LOQ-0.02)
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report. ● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification.** ● **LOQ= limit of quantification.** ● **Environmental condition – Satisfactory & Clear** ● **Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05).** ● **pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No. 4, 12 & 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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Anacon Laboratories

TC-12998

Test Report

ULR No.- TC129982500003772F
Test Report No.: ALPL/23062025/01-23 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-23 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25		**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 24.05.2025 **Sampling Time** Not Mentioned	Kalmana (Well No.-BA-30B)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	119.17
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	120.65
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	**143.2**
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	8.74
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	8.89
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.40
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	55.85
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**686**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**394**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003772F
Test Report No.: ALPL/23062025/01-23 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-23	**Analysis Start**	12.06.2025
	Inward Date	11.06.2025	**Analysis End**	23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025		
	Inv. No.	25		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date**	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	24.05.2025 **Sampling Time** Not Mentioned	Kalmana (Well No.-BA-30B)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.21
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report ● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification.** ● **LOQ= limit of quantification.** ● **Environmental condition – Satisfactory & Clear** ● **Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05).** ● **pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No. 4, 12 & 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

----------END OF REPORT----------

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Anacon Laboratories

TC-12998

Test Report

ULR No.- TC129982500003773F
Test Report No.: ALPL/23062025/01-24 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-24	**Analysis Start** 12.06.2025
	Inward Date	11.06.2025	**Analysis End** 23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025	
	Inv. No.	25	

Sample Description	Sample Details As Provided By Client	Purpose of analysis	Quantity Received
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	Sampling Date / Sampling Time	Sampling Location
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	Sampling Date 24.05.2025 Sampling Time Not Mentioned	Mutra (Well No.-BA-31)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	130.52
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	127.30
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	**117.6**
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	20.41
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	8.14
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.67
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	32.10
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**610**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**378**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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ANACON LABORATORIES PVT. LTD. ORIGINAL

Test Report

ULR No.- TC129982500003773F
Test Report No.: ALPL/23062025/01-24

Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-24	**Analysis Start**	12.06.2025
	Inward Date	11.06.2025	**Analysis End**	23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025		
	Inv. No.	25		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 24.05.2025 **Sampling Time** Not Mentioned	Mutra (Well No.-BA-31)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.14
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

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REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No. 4, 12 & 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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TC-12998

Test Report

ULR No.- TC129982500003774F
Test Report No.: ALPL/23062025/01-25 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-25	**Analysis Start**	12.06.2025
	Inward Date	11.06.2025	**Analysis End**	23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025		
	Inv. No.	25		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date**	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	24.05.2025 **Sampling Time** Not Mentioned	Chandanvahi (Well No.-BA-32)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	102.15
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	106.40
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	69.6
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	15.06
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	5.10
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.19
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	36.19
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	416
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**236**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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ANACON LABORATORIES PVT. LTD. ORIGINAL

Test Report

ULR No.- TC129982500003774F
Test Report No.: ALPL/23062025/01-25 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-25	**Analysis Start**	12.06.2025
	Inward Date	11.06.2025	**Analysis End**	23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025		
	Inv. No.	25		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date**	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	24.05.2025 **Sampling Time** Not Mentioned	Chandanvahi (Well No.-BA-32)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.06
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report.● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification.** ● **LOQ= limit of quantification.** ● **Environmental condition – Satisfactory & Clear** ● **Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05).** ● **pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the test Sr. No. 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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Anacon Laboratories

TC-12998

Test Report

ULR No.- TC129982500003775F
Test Report No.: ALPL/23062025/01-26 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-26 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date** 24.05.2025 **Sampling Time** Not Mentioned	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01		Panderponi (Well No.-BA-33)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	96.47
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	112.58
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	67.2
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	28.67
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	5.32
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.57
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	48.73
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	467
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**286**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003775F
Test Report No.: ALPL/23062025/01-26 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-26	**Analysis Start**	12.06.2025
	Inward Date	11.06.2025	**Analysis End**	23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025		
	Inv. No.	25		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 24.05.2025 **Sampling Time** Not Mentioned	Panderponi (Well No.-BA-33)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.19
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report. ● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification. ● LOQ= limit of quantification. ● Environmental condition – Satisfactory & Clear ● Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05). ● pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the test Sr. No. 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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Anacon Laboratories

TC-12998

Test Report

ULR No.- TC129982500003776F
Test Report No.: ALPL/23062025/01-27 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-27 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25		**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 24.05.2025 **Sampling Time** Not Mentioned	Khamona (Well No.-BA-34)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	68.1
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	95.48
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	43.2
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	16.03
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	5.13
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.74
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	47.87
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	308
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	174
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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ANACON LABORATORIES PVT. LTD. ORIGINAL

Test Report

ULR No.- TC129982500003776F
Test Report No.: ALPL/23062025/01-27

Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-27	**Analysis Start** 12.06.2025
	Inward Date	11.06.2025	**Analysis End** 23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025	
	Inv. No.	25	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 24.05.2025 **Sampling Time** Not Mentioned	Khamona (Well No.-BA-34)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.18
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report.● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification. ● LOQ= limit of quantification. ● Environmental condition – Satisfactory & Clear ● Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05). ● pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is complying with IS 10500(2012).**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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Anacon Laboratories

TC-12998

Test Report

ULR No.- TC129982500003777F
Test Report No.: ALPL/23062025/01-28 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-28	**Analysis Start**	12.06.2025
	Inward Date	11.06.2025	**Analysis End**	23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025		
	Inv. No.	25		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 24.05.2025 **Sampling Time** Not Mentioned	Arvi (Well No.-BA-35)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	170.25
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	90.33
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	58.4
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	27.21
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	7.67
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.58
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	32.96
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**561**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**258**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003777F
Test Report No.: ALPL/23062025/01-28 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-28	**Analysis Start**	12.06.2025
	Inward Date	11.06.2025	**Analysis End**	23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025		
	Inv. No.	25		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 24.05.2025 **Sampling Time** Not Mentioned	Arvi (Well No.-BA-35)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	BLQ(LOQ-0.02)
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report ● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification. ● LOQ= limit of quantification. ● Environmental condition – Satisfactory & Clear ● Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05). ● pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No. 12 & 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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Test Report

ULR No.- TC129982500003778F
Test Report No.: ALPL/23062025/01-29 Dated 23.06.2025 Page 1 of 2

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-29 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description	Sample Details As Provided By Client	Purpose of analysis	Quantity Received
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	Sampling Date / Sampling Time	Sampling Location
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	Sampling Date 24.05.2025 Sampling Time Not Mentioned	Rajura (Well No.-BA-36)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	187.27
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	129.18
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	62.4
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	28.67
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	8.07
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.85
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	44.36
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**627**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**274**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By **Authorized Signatory**

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Chinmay Garwa
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003778F
Test Report No.: ALPL/23062025/01-29 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-29 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date** 24.05.2025 **Sampling Time** Not Mentioned	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01		Rajura (Well No.-BA-36)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.24
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report.● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification. ● LOQ= limit of quantification. ● Environmental condition – Satisfactory & Clear ● Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05). ● pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only**. Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No. 12 & 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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Anacon Laboratories

TC-12998

Test Report

ULR No.- TC129982500003779F
Test Report No.: ALPL/23062025/01-30 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-30	**Analysis Start** 12.06.2025
	Inward Date	11.06.2025	**Analysis End** 23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025	
	Inv. No.	25	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 25.05.2025 **Sampling Time** Not Mentioned	Botgaon (DCB) (Well No.-BA-37)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	**385.9**
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	**344.82**
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	**171.2**
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	**71.44**
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	11.96
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.28
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	64.30
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**1488**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**722**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003779F
Test Report No.: ALPL/23062025/01-30 Dated 23.06.2025 Page 2 of 2

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-30	**Analysis Start**	12.06.2025
	Inward Date	11.06.2025	**Analysis End**	23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025		
	Inv. No.	25		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 25.05.2025 **Sampling Time** Not Mentioned	Botgaon (DCB) (Well No.-BA-37)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.12
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report ● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification. ● LOQ= limit of quantification. ● Environmental condition – Satisfactory & Clear ● Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05). ● pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No.1, 3, 4, 7, 12 & 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

----------END OF REPORT----------

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

ORIGINAL TEST REPORT

Anacon Laboratories

TC-12998

Test Report

ULR No.- TC129982500003780F
Test Report No.: ALPL/23062025/01-31 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-31	**Analysis Start**	12.06.2025
	Inward Date	11.06.2025	**Analysis End**	23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025		
	Inv. No.	25		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 25.05.2025 **Sampling Time** Not Mentioned	Somthana (Well No.-BA-38)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	179.2
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	165.78
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	**86.4**
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	**40.82**
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	10.63
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.33
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	44.74
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**812**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**384**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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ANACON LABORATORIES PVT. LTD. ORIGINAL

Test Report

ULR No.- TC129982500003780F
Test Report No.: ALPL/23062025/01-31 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-31	**Analysis Start**	12.06.2025
	Inward Date	11.06.2025	**Analysis End**	23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025		
	Inv. No.	25		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 25.05.2025 **Sampling Time** Not Mentioned	Somthana (Well No.-BA-38)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	BLQ(LOQ-0.02)
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

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REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No. 4, 7, 12 & 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

----------END OF REPORT----------

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Anacon Laboratories

TC-12998

Test Report

ULR No.- TC129982500003781F
Test Report No.: ALPL/23062025/01-32 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-32	**Analysis Start**	12.06.2025
	Inward Date	11.06.2025	**Analysis End**	23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025		
	Inv. No.	25		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 25.05.2025 **Sampling Time** Not Mentioned	Sakharwahi (Well No.-BA-39)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	156.8
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	76.73
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	53.6
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	24.78
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	3.98
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.46
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	34.57
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	474
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**236**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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ANACON LABORATORIES PVT. LTD. ORIGINAL TEST REPORT

Anacon Laboratories

TC-12998

Test Report

ULR No.- TC129982500003781F
Test Report No.: ALPL/23062025/01-32

Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-32	**Analysis Start** 12.06.2025
	Inward Date	11.06.2025	**Analysis End** 23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025	
	Inv. No.	25	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 25.05.2025 **Sampling Time** Not Mentioned	Sakharwahi (Well No.-BA-39)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.34
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report ● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification.** ● **LOQ= limit of quantification.** ● **Environmental condition – Satisfactory & Clear** ● **Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05).** ● **pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the test Sr. No. 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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TC-12998

Test Report

ULR No.- TC129982500003783F
Test Report No.: ALPL/23062025/01-34

Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-34	**Analysis Start** 12.06.2025
	Inward Date	11.06.2025	**Analysis End** 23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025	
	Inv. No.	25	

Sample Description	Sample Details As Provided By Client	Purpose of analysis	Quantity Received
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	Sampling Date / Sampling Time	Sampling Location
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	Sampling Date 25.05.2025 Sampling Time Not Mentioned	Aheri (Well No.-BA-43)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	190.4
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	154.92
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	**104.8**
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	**39.85**
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	8.35
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.11
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	33.24
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**893**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**426**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	Agreeable
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garwa
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003783F
Test Report No.: ALPL/23062025/01-34 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-34 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date** 25.05.2025 **Sampling Time** Not Mentioned	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01		Aheri (Well No.-BA-43)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.22
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report.● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification. ● LOQ= limit of quantification. ● Environmental condition – Satisfactory & Clear ● Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05). ● pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No. 4, 7, 12 & 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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TC-12998

Test Report

ULR No.- TC129982500003785F
Test Report No.: ALPL/23062025/01-36 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-36 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25		**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date** 26.05.2025 **Sampling Time** Not Mentioned	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01		Chunala (Well No.-BA-50)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	140
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	88.87
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	56
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	25.27
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	6.89
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.30
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	13.01
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**504**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**244**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	Agreeable
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003785F
Test Report No.: ALPL/23062025/01-36 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-36	**Analysis Start**	12.06.2025	
	Inward Date	11.06.2025	**Analysis End**	23.06.2025	
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025			
	Inv. No.	25			

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date**	26.05.2025	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Time**	Not Mentioned	Chunala (Well No.-BA-50)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.04
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

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REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No. 12 & 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

----------END OF REPORT----------

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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TC-12998

Test Report

ULR No.- TC129982500003805F
Test Report No.: ALPL/23062025/01-56 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-56 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description Ground Water	**Sample Details As Provided By Client** Ground Water (Ballarpur Area)	**Purpose of analysis** Drinking	**Quantity Received** 1 Ltr
Sampling By Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 29.05.2025 **Sampling Time** Not Mentioned	**Sampling Location** Ballarsah (Well No.-CL 5)	

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	136.2
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	132.53
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	61.6
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	27.70
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	4.85
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.26
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	36.66
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	324
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**268**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003805F
Test Report No.: ALPL/23062025/01-56

Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/110625/W-2/64-56	**Analysis Start**	12.06.2025
	Inward Date	11.06.2025	**Analysis End**	23.06.2025
	Reference	WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025		
	Inv. No.	25		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 29.05.2025 **Sampling Time** Not Mentioned	Ballarsah (Well No.-CL 5)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.59
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

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REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the test Sr. No. 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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Anacon Laboratories

TC-12998

Test Report

ULR No.- TC129982500003806F
Test Report No.: ALPL/23062025/01-57 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-57 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25		**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 29.05.2025 **Sampling Time** Not Mentioned	Ballarpur (Well No.-CL 6)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	79.45
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	141.55
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	**92.8**
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	**36.45**
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	6.28
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.14
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	36.00
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**527**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**382**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003806F
Test Report No.: ALPL/23062025/01-57 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-57 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date** 29.05.2025 **Sampling Time** Not Mentioned	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01		Ballarpur (Well No.-CL 6)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.23
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report ● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification. ● LOQ= limit of quantification. ● Environmental condition – Satisfactory & Clear ● Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05). ● pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No.4, 7, 12 & 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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TC-12998

Test Report

ULR No.- TC129982500003807F
Test Report No.: ALPL/23062025/01-58 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-58 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date** 30.05.2025 **Sampling Time** Not Mentioned	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01		Nav Dahli (Well No.-CL 7)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	124.85
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	119.95
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	69.6
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	15.06
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	5.62
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.13
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	21.46
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	426
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**236**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003807F
Test Report No.: ALPL/23062025/01-58 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-58 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25		**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date** 30.05.2025 **Sampling Time** Not Mentioned	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01		Nav Dahli (Well No.-CL 7)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.51
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report.● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification. ● LOQ= limit of quantification. ● Environmental condition – Satisfactory & Clear ● Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05). ● pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the test Sr. No. 14.**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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TC-12998

Test Report

ULR No.- TC129982500003809F
Test Report No.: ALPL/23062025/01-60 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-60 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	
Sample Description Ground Water	**Sample Details As Provided By Client** Ground Water (Ballarpur Area)	**Purpose of analysis** Drinking	**Quantity Received** 1 Ltr
Sampling By Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 30.05.2025 **Sampling Time** Not Mentioned	**Sampling Location** Daheli (Well No.-CL 9)	
Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).			

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	136.2
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	142.78
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	**97.6**
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	**36.93**
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	6.11
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.43
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	38.56
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**610**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**396**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003809F
Test Report No.: ALPL/23062025/01-60 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-60 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025

Sample Description Ground Water	**Sample Details As Provided By Client** Ground Water (Ballarpur Area)	**Purpose of analysis** Drinking	**Quantity Received** 1 Ltr
Sampling By Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 30.05.2025 **Sampling Time** Not Mentioned	**Sampling Location** Daheli (Well No.-CL 9)	
Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)			

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.09
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

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REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No. 4, 7, 12 & 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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TC-12998

Test Report

ULR No.- TC129982500003810F
Test Report No.: ALPL/23062025/01-61

Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-61 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date** 30.05.2025 **Sampling Time** Not Mentioned	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01		Beghar (Well No.-CL 10)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	147.55
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	130.15
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	**131.2**
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	20.89
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	9.95
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.05
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	44.64
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**826**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**414**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garwal
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003810F
Test Report No.: ALPL/23062025/01-61 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-61 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025

Sample Description Ground Water	**Sample Details As Provided By Client** Ground Water (Ballarpur Area)	**Purpose of analysis** Drinking	**Quantity Received** 1 Ltr
Sampling By Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 30.05.2025 **Sampling Time** Not Mentioned	**Sampling Location** Beghar (Well No.-CL 10)	
Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)			

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.27
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report. ● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification. ● LOQ= limit of quantification. ● Environmental condition – Satisfactory & Clear ● Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05). ● pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No. 4, 12 & 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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TC-12998

Test Report

ULR No.- TC129982500003811F
Test Report No.: ALPL/23062025/01-62 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-62 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25		**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025

Sample Description Ground Water	**Sample Details As Provided By Client** Ground Water (Ballarpur Area)	**Purpose of analysis** Drinking	**Quantity Received** 1 Ltr
Sampling By Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 31.05.2025 **Sampling Time** Not Mentioned	**Sampling Location** Kentukum (Well No.-CL 11)	

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	136.2
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	119.95
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	**134.4**
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	24.78
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	10.63
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.26
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	48.16
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**904**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**438**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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TC-12998

Test Report

ULR No.- TC129982500003811F
Test Report No.: ALPL/23062025/01-62 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-62 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By	**Sampling Date** 31.05.2025 **Sampling Time** Not Mentioned	**Sampling Location**
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01		Kentukum (Well No.-CL 11)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.51
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

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REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No. 4, 12 & 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

----------END OF REPORT----------

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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TC-12998

Test Report

ULR No.- TC129982500003812F
Test Report No.: ALPL/23062025/01-63 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-63 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	

Sample Description Ground Water	**Sample Details As Provided By Client** Ground Water (Ballarpur Area)	**Purpose of analysis** Drinking	**Quantity Received** 1 Ltr
Sampling By Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 31.05.2025 **Sampling Time** Not Mentioned	**Sampling Location** Visapur (Well No.-CL 12)	

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	158.9
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	127.30
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	**107.2**
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	25.75
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	8.16
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.14
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	32.29
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**710**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**374**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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TC-12998

Test Report

ULR No.- TC129982500003812F
Test Report No.: ALPL/23062025/01-63 Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-63 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025

Sample Description Ground Water	**Sample Details As Provided By Client** Ground Water (Ballarpur Area)	**Purpose of analysis** Drinking	**Quantity Received** 1 Ltr
Sampling By Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 31.05.2025 **Sampling Time** Not Mentioned	**Sampling Location** Visapur (Well No.-CL 12)	
Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)			

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.09
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

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REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No. 4, 12 & 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

----------END OF REPORT----------

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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TC-12998

Test Report

ULR No.- TC129982500003813F
Test Report No.: ALPL/23062025/01-64

Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-64 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025

Sample Description	Sample Details As Provided By Client	Purpose of analysis	Quantity Received
Ground Water	Ground Water (Ballarpur Area)	Drinking	1 Ltr

Sampling By		Sampling Location
Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 31.05.2025 **Sampling Time** Not Mentioned	Harasti (Well No.-CL 17)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group - Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	141.87
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	133.55
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	**115.2**
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	27.70
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	7.46
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.72
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	56.80
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**816**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**402**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues in Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks.

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.- TC129982500003813F
Test Report No.: ALPL/23062025/01-64

Dated 23.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/110625/W-2/64-64 **Inward Date** 11.06.2025 **Reference** WCL/HQ/ENV/14-L/1122-1148 Dt 19 Apr 2025 **Inv. No.** 25	**Analysis Start** 12.06.2025 **Analysis End** 23.06.2025	
Sample Description Ground Water	**Sample Details As Provided By Client** Ground Water (Ballarpur Area)	**Purpose of analysis** Drinking	**Quantity Received** 1 Ltr
Sampling By Anacon Representative - Mr. Tousif Khan Sampling Method:ANtd/7.2/MON-01	**Sampling Date** 31.05.2025 **Sampling Time** Not Mentioned	**Sampling Location** Harasti (Well No.-CL 17)	
Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)			

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues in Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.26
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report ● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification.** ● **LOQ= limit of quantification.** ● **Environmental condition – Satisfactory & Clear** ● **Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05).** ● **pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No.4, 12 & 14**

Verified By

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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TC-12998

Test Report

ULR No.-TC129982500003733F
Test Report No.: ALPL/20062025/06-39 Dated 20.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/09062025/W-1/54-39	**Analysis Start**	09.06.2025
	Inward Date	09.06.2025	**Analysis End**	20.06.2025
	Reference	WCL/HQ/ENV/14-L/ 1122-1148 dt19 Apr 2025		
	Inv. No.	23		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Chandrapur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr.Kartik Shrivas Sampling Method- ANtd/7.2/MON-01	**Sampling Date** 30.05.2025 **Sampling Time** Not Mentioned	ADITYA NAGAR RAMPUR (Well No-CB-59)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group- Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	158.9
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	62.22
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	48
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	17.49
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	5.27
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.55
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	19.94
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	492
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	192
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues In Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks .

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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TC-12998

Test Report

ULR No.-TC129982500003733F
Test Report No.: ALPL/20062025/06-39 **Dated 20.06.2025**

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/09062025/W-1/54-39	**Analysis Start**	09.06.2025
	Inward Date	09.06.2025	**Analysis End**	20.06.2025
	Reference	WCL/HQ/ENV/14-L/ 1122-1148 dt19 Apr 2025		
	Inv. No.	23		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Chandrapur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr.Kartik Shrivas Sampling Method- ANtd/7.2/MON-01	**Sampling Date** 30.05.2025 **Sampling Time** Not Mentioned	ADITYA NAGAR RAMPUR (Well No-CB-59)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues In Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.33
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

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REMARKS : As requested by the client, the sample was tested for the above parameters only. Sample bearing the details mentioned as above is complying with IS 10500 (2012).

Verified By
Dhanashree Hiwanj
Sr. Technical Assistant

----------END OF REPORT----------

Authorized Signatory
Chinmay Garwal
Deputy Quality Manager

ORIGINAL TEST REPORT

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TC-12998

Test Report

ULR No.-TC129982500003734F
Test Report No.: ALPL/20062025/06-40 **Dated 20.06.2025**

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/09062025/W-1/54-40	**Analysis Start** 09.06.2025
	Inward Date	09.06.2025	**Analysis End** 20.06.2025
	Reference	WCL/HQ/ENV/14-L/ 1122-1148 dt19 Apr 2025	
	Inv. No.	23	

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Chandrapur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr.Kartik Shrivas Sampling Method- ANtd/7.2/MON-01	**Sampling Date** 30.05.2025 **Sampling Time** Not Mentioned	SAKHARI (Well No-CB-60)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group- Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	141.87
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	66.97
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	51.2
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	24.78
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	5.88
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.45
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	14.72
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	421
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	230
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues In Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks .

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garwal
Deputy Quality Manager

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Test Report

ULR No.-TC129982500003734F
Test Report No.: ALPL/20062025/06- 40 **Dated 20.06.2025**

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/09062025/W-1/54-40	**Analysis Start**	09.06.2025
	Inward Date	09.06.2025	**Analysis End**	20.06.2025
	Reference	WCL/HQ/ENV/14-L/ 1122-1148 dt19 Apr 2025		
	Inv. No.	23		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Chandrapur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr.Kartik Shrivas Sampling Method- ANtd/7.2/MON-01	**Sampling Date** 30.05.2025 **Sampling Time** Not Mentioned	SAKHARI (Well No-CB-60)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues In Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.46
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

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REMARKS : As requested by the client, the sample was tested for the above parameters only. Sample bearing the details mentioned as above is complying with IS 10500 (2012).

Verified By
Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory
Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

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TC-12998

Test Report

ULR No.-TC129982500003735F
Test Report No.: ALPL/20062025/06-41 Dated 20.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.** ALPL/09062025/W-1/54-41 **Inward Date** 09.06.2025 **Reference** WCL/HQ/ENV/14-L/ 1122-1148 dt19 Apr 2025 **Inv. No.** 23		**Analysis Start** 09.06.2025 **Analysis End** 20.06.2025

Sample Description	Sample Details As Provided By Client	Purpose of analysis	Quantity Received
Ground Water	Ground Water (Chandrapur Area)	Drinking	1 Ltr

Sampling By		Sampling Location
Anacon Representative - Mr.Kartik Shrivas Sampling Method- ANtd/7.2/MON-01	**Sampling Date** 30.05.2025 **Sampling Time** Not Mentioned	MATHARA (Well No-CB-61)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group- Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	164.57
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	79.80
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	58.6
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	28.18
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	6.08
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.48
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	22.41
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	**538**
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	**262**
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues In Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks .

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

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Test Report

ULR No.-TC129982500003735F
Test Report No.: ALPL/20062025/06-41 **Dated 20.06.2025**

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/09062025/W-1/54-41	**Analysis Start**	09.06.2025
	Inward Date	09.06.2025	**Analysis End**	20.06.2025
	Reference	WCL/HQ/ENV/14-L/ 1122-1148 dt19 Apr 2025		
	Inv. No.	23		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Chandrapur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr.Kartik Shrivas Sampling Method- ANtd/7.2/MON-01	**Sampling Date** 30.05.2025 **Sampling Time** Not Mentioned	MATHARA (Well No-CB-61)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues In Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.29
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report. ● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. **● BLQ= below limit of quantification. ● LOQ= limit of quantification. ● Environmental condition – Satisfactory & Clear ● Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05). ● pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. **Sample bearing the details mentioned as above is not complying with IS 10500(2012) requirements for the tests Sr. No. 12 & 14.**

Verified By
Dhanashree Hiwanj
Sr. Technical Assistant

----------END OF REPORT----------

Authorized Signatory
Chinmay Garway
Deputy Quality Manager

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TC-12998

Test Report

ULR No.-TC129982500003745F
Test Report No.: ALPL/20062025/06-50 Dated 20.06.2025

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/09062025/W-1/54-50	**Analysis Start**	09.06.2025
	Inward Date	09.06.2025	**Analysis End**	20.06.2025
	Reference	WCL/HQ/ENV/14-L/ 1122-1148 dt19 Apr 2025		
	Inv. No.	23		

Sample Description	Sample Details As Provided By Client	Purpose of analysis	Quantity Received
Ground Water	Ground Water (Chandrapur Area)	Drinking	1 Ltr

Sampling By		Sampling Location
Anacon Representative - Mr.Kartik Shrivas Sampling Method- ANtd/7.2/MON-01	**Sampling Date** 31.05.2025 **Sampling Time** Not Mentioned	MANNA (Well No-CL 14)

Tests Required Total Alkalinity(as Calcium carbonate), Colour, Chloride (as Cl), Calcium (as Ca), Free Residual Chlorine, Fluoride (as F), Magnesium (as Mg), Nitrate (as NO3), Odour, pH, Sulphate (as SO4), Total dissolved solids, Turbidity, Total hardness (as CaCO3), Phenolic compounds, Arsenic (as As), Aluminium (as Al), Boron (as B), Copper (as Cu).

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
I	**Discipline – Chemical**		**Group- Water**			
1	Total Alkalinity(as Calcium carbonate)	mg/l	IS 3025 (Part 23)	200	600	141.87
2	Colour	Hazen	IS 3025 (Part 4) : clause 4	5	15	BLQ(LOQ-1)
3	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :clause 2	250	1000	49.40
4	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : clause 5	75	200	48
5	Free Residual Chlorine	mg/l	IS 3025 (Part 26) : clause 7	0.2	1	BLQ(LOQ-0.1)
6	Fluoride (as F)	mg/l	IS 3025 (Part 60/sec1) : clause 6	1.0	1.5	BLQ(LOQ-0.1)
7	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : clause 6	30	100	13.60
8	Nitrate (as NO_3)	mg/l	IS 3025 (Part 34/Sec1) :clause 6.4	45	No relaxation	4.45
9	Odour	-	IS 3025 (Part 5)	Agreeable	Agreeable	Agreeable
10	pH	-	IS 3025 (Part 11)	6.5 to 8.5	No relaxation	7.57
11	Sulphate (as SO_4)	mg/l	IS 3025 (Part 24/Sec 1) : clause 5	200	400	18.99
12	Total dissolved solids	mg/l	IS 3025 (Part 16)	500	2000	466
13	Turbidity	NTU	IS 3025 (Part 10)	1	5	0.1
14	Total hardness (as $CaCO_3$)	mg/l	IS 3025 (Part 21) clause 5	200	600	176
15	Phenolic compounds	mg/l	IS 3025 (Part 43/Sec1) : clause 6	0.001	0.002	BLQ(LOQ-0.001)
II	**Discipline – Chemical**		**Group- Residues In Water**			
16	Arsenic (as As)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
17	Aluminium (as Al)	mg/l	IS 3025 (Part 2)	0.03	0.2	BLQ(LOQ-0.02)
18	Boron (as B)	mg/l	IS 3025 (Part 2)	0.5	2.4	BLQ(LOQ-0.02)
19	Copper (as Cu)	mg/l	IS 3025 (Part 2)	0.05	1.5	BLQ(LOQ-0.02)

● Please refer last Page for Note and remarks .

Verified By

Snehal Raut
Technical Manager

Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory

Chinmay Garway
Deputy Quality Manager

Thank you for instilling your trust and faith in our services. We cherish our relationship with you, and we put in a lot of hard work in making sure that you get a seamless experience at every stage of your interaction with us. In our constant endeavour towards ensuring that your next experience will be significantly better than the current one, we welcome your feedback on feedback@anacon.in.

Test Report

ULR No.-TC129982500003745F
Test Report No.: ALPL/20062025/06-50 **Dated 20.06.2025** Page 2 of 2

Issued To : **M/s Western Coalfields Limited (WCL)** Futala Road, Coal Estate, Civil Lines, Nagpur, WCL HQ (M.S), 440006	**Sample Inward No.**	ALPL/09062025/W-1/54-50	**Analysis Start**	09.06.2025
	Inward Date	09.06.2025	**Analysis End**	20.06.2025
	Reference	WCL/HQ/ENV/14-L/ 1122-1148 dt19 Apr 2025		
	Inv. No.	23		

Sample Description	**Sample Details As Provided By Client**	**Purpose of analysis**	**Quantity Received**
Ground Water	Ground Water (Chandrapur Area)	Drinking	1 Ltr

Sampling By		**Sampling Location**
Anacon Representative - Mr.Kartik Shrivas Sampling Method- ANtd/7.2/MON-01	**Sampling Date** 31.05.2025 **Sampling Time** Not Mentioned	MANNA (Well No-CL-14)

Tests Required Cadmium (as Cd),Iron (as Fe), Lead (as Pb), Manganese (as Mn), Nickel (as Ni), Selenium (as Se), Total Chromium (as Cr), Zinc (as Zn)

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Ground Water Specifications) Including Amendment No. 4		Test Result
				Acceptable Limit	Permissible Limit #	
II	**Discipline – Chemical**		**Group- Residues In Water**			
20	Cadmium (as Cd)	mg/l	IS 3025 (Part 2)	0.003	No relaxation	BLQ(LOQ-0.002)
21	Iron (as Fe)	mg/l	IS 3025 (Part 2)	1.0	No relaxation	0.41
22	Lead (as Pb)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
23	Manganese (as Mn)	mg/l	IS 3025 (Part 2)	0.1	0.3	BLQ(LOQ-0.02)
24	Nickel (as Ni)	mg/l	IS 3025 (Part 2)	0.02	No relaxation	BLQ(LOQ-0.01)
25	Selenium (as Se)	mg/l	IS 3025 (Part 2)	0.01	No relaxation	BLQ(LOQ-0.01)
26	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2)	0.05	No relaxation	BLQ(LOQ-0.02)
27	Zinc (as Zn)	mg/l	IS 3025 (Part 2)	5	15	BLQ(LOQ-0.02)

NOTE: ● Please see watermark "Original Test Report" to confirm the authenticity of this report. ● Results shall be referred to tested sample(s) and applicable to tested parameters only. ● Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ● Liability of Anacon Labs is limited to invoiced amount only. ● Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ● #Permissible limit in absence of an alternate source for drinking water. ● 'mg/l' is equivalent to 'ppm'. ● **BLQ= below limit of quantification.** ● **LOQ= limit of quantification.** ● **Environmental condition – Satisfactory & Clear** ● **Statement of conformity issued on the basis of decision rule as per quality procedure (QP/7.8/05).** ● **pH Value was measured at 25°C.**

REMARKS : As requested by the client, the sample was tested for the above parameters only. Sample bearing the details mentioned as above is complying with IS 10500 (2012).

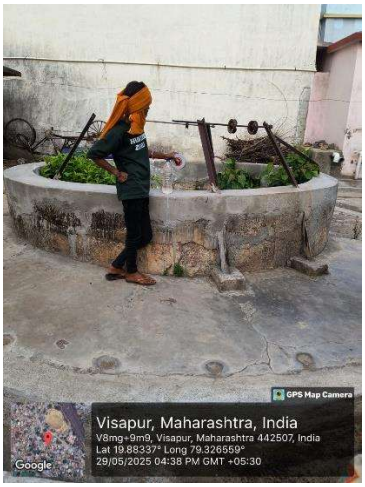
Verified By
Dhanashree Hiwanj
Sr. Technical Assistant

Authorized Signatory
Chinmay Garway
Deputy Quality Manager

----------END OF REPORT----------

ORIGINAL TEST REPORT

Thank you for instilling your trust and faith in our services. We cherish our relationship with you, and we put in a lot of hard work in making sure that you get a seamless experience at every stage of your interaction with us. In our constant endeavour towards ensuring that your next experience will be significantly better than the current one, we welcome your feedback on feedback@anacon.in.



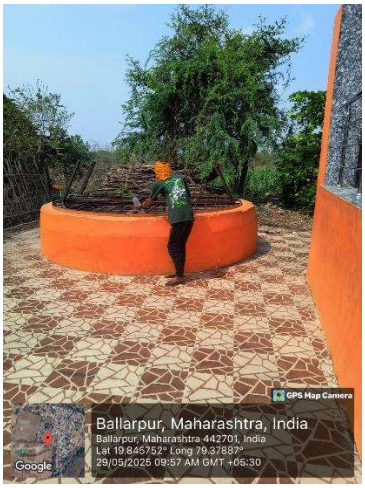
CL12 - VISAPUR

CL 11 - KENTUKUM

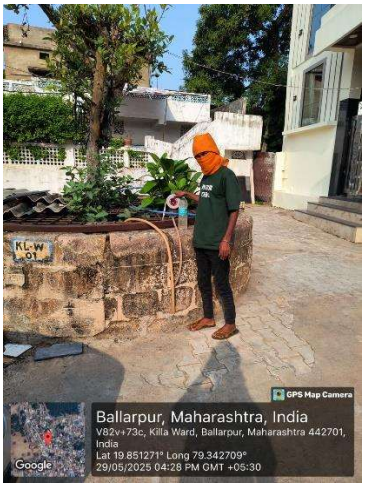
CL 10 - BEGHAR

CL 9 - DAHELI

CL 7 - NAV DAHLI



CL 6 - BALLARPUR



CL 5 - BALLARSAH

BA 50 - CHUNALA

BA 43 - Aheri

BA 39 - Sakharwahi

BA 38 - Somthana

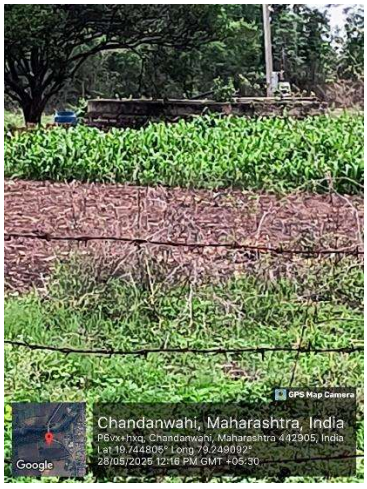
BA 37 - Botgaon (DCB)

BA 36 - Rajura

BA 35 - Arvi

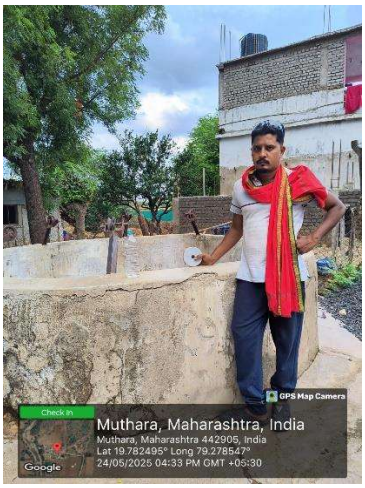
BA 29 - Antargoan Khurd

BA 34 - Khamona



BA 33 - Panderponi

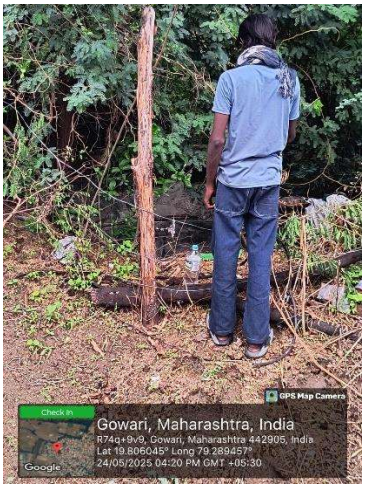
BA 32 - Chandanvahi



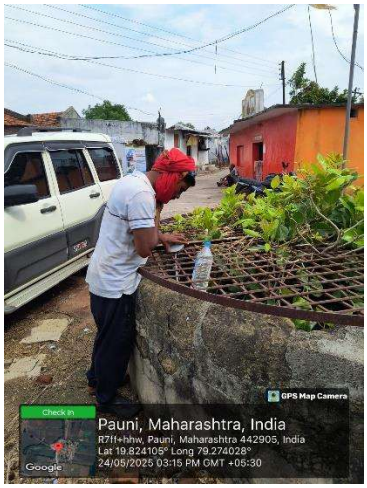
BA 31 - Mutra

BA30B - KALMANA

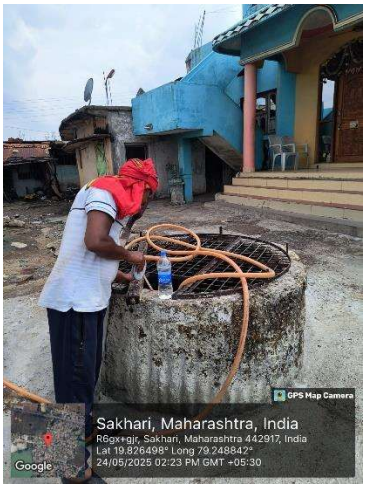
BA 28 A - Goigaon(Hand pump tw)



BA 23 - Gauri (PZ)



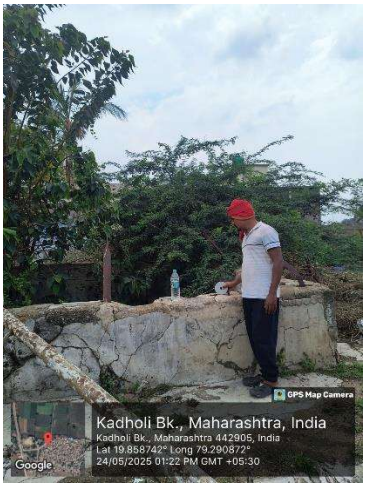
BA 21 - Pauni



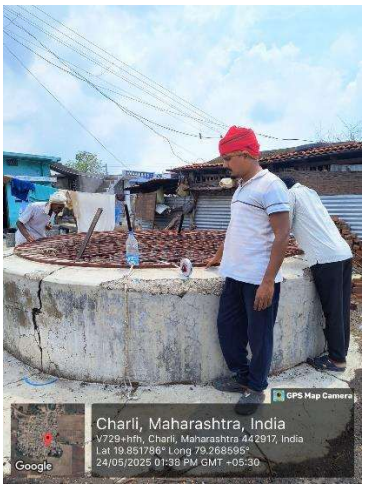
BA 20 A - Sakri

BA 19 - Manoli

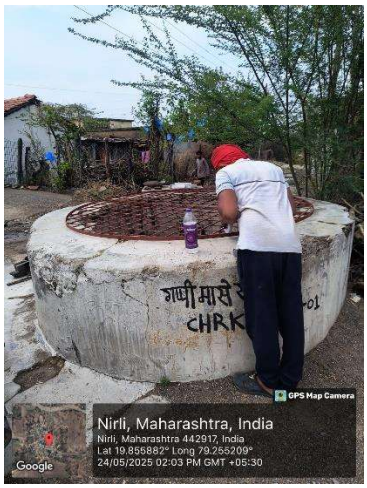
BA 18 - Babapur



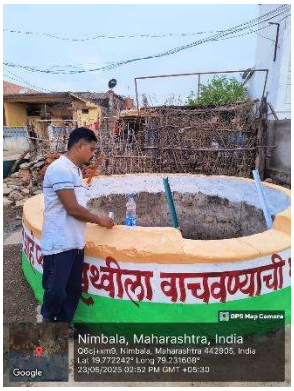
BA17 - Kadoli



BA 16 - Charli

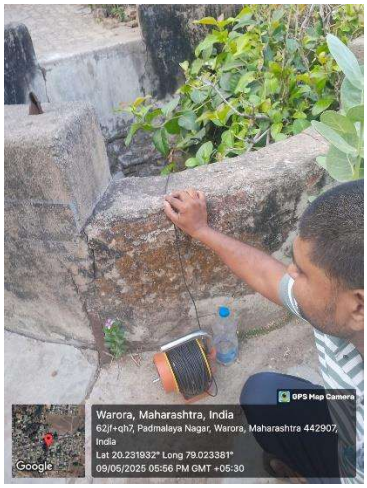


BA 15 - Nirli (DCB)



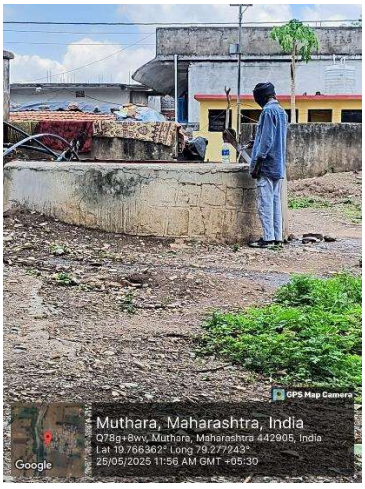
BA 11 A - Nimbara

BA 10 - Hirapur



BA5A - warora

BA 3 - Pelura (DCB)



CL 17 - HARASTI

CB 61 - MATHARA

CB 60 - SAKHARI

CB 59 - ADITYA NAGAR RAMPUR

CL 14 - MANNA

Annexure – 51

Photo of Piezometer, Sasti OC Mine

Table 6.9: Computation of groundwater recharge by RTRWHS.

Sr.no.	Location	Area (m^2)	Annual rainfall (m)	Runoff Coefficient	Estimated yearly recharge (m3/y)
1	Rooftop Rainwater Harvesting Structure at Ballarpur Area General Manager's Office	900	1.116	0.85	854
2	Rooftop Rainwater Harvesting Structure at Sub-Area Manager's Office Gauri	262.5	1.116	0.85	249
3	Rooftop Rainwater Harvesting Structure at Manager's Office Gauri Deep	99.7	1.116	0.85	95
4	Rooftop Rainwater Harvesting Structure at Officer's guest house, Sasti colony	300	1.116	0.85	285
5	Rooftop Rainwater Harvesting Structure at E&M Workshop Gauri Deep OC	288	1.116	0.85	273
6	Rooftop Rainwater Harvesting Structure at Manager's Office, Ballarpur UG Expn. Mine	261	1.116	0.85	248
Sub-Total (B)					**2004**
Total (A+B)					**20,860**

It is apparent from the above assessment that all these RTRWHS will augment the groundwater recharge to the tune of **2004 m^3/year** in the study area. ***Total ground water recharge from ponds and RTRWHS will be around* 20,860 *m^3/year (*18,856*m^3/year + 2004 m^3/year).***

Photographs of these RTRWHS are provided below in **Figure 6.5 - Figure 6.12.**

Figure 6.5:Roof Top Rainwater Harvesting at Area General Manager's Office, Ballarpur Area

Figure 6.6:Roof top rain harvesting structure at Sub area Manager's office, Gauri Sub area, Ballarpur area

Figure 6.7:Roof top rain water harvesting structure at Manager's office, Gauri Deep OC, Ballarpur area

Figure 6.8:Roof top rainwater harvesting structure at Officer's Guest House, Sasti Colony.

Figure 6.9: Roof top rainwater harvesting and recharge pit at E&M Workshop, Gauri Deep OC, Ballarpur area

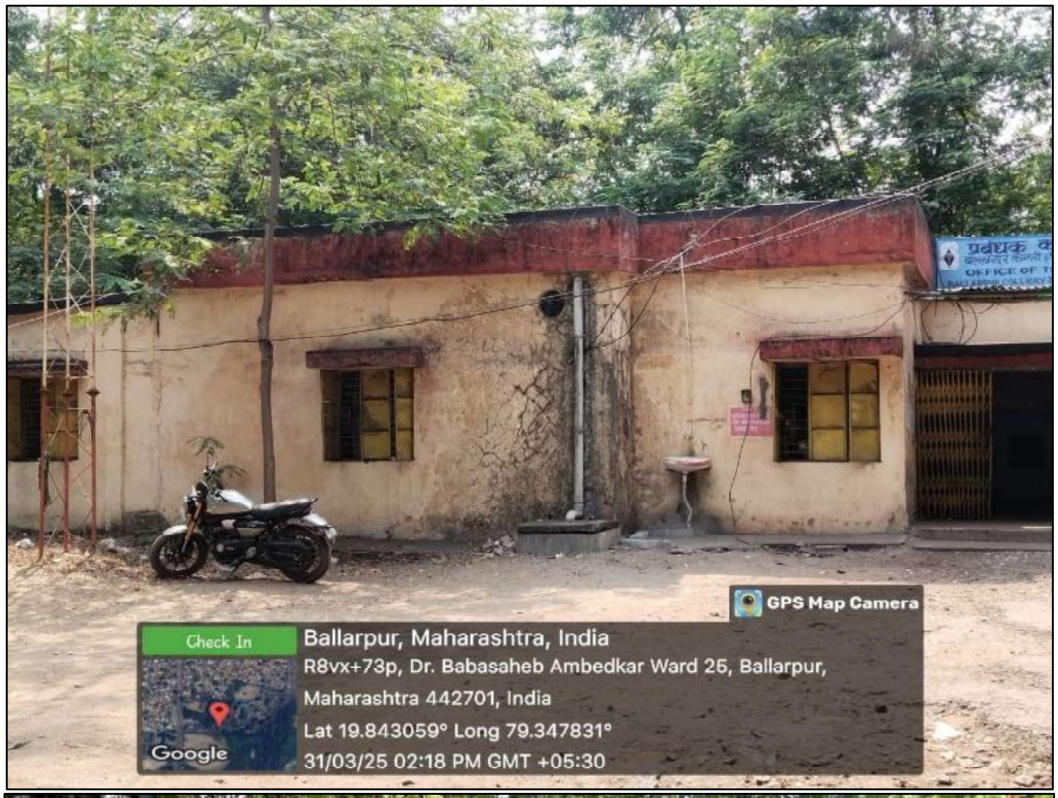


Figure 6.10:RWH structure at Manager's Office, Ballarpur UG Expn. Mine

वेस्टर्न कोलफील्ड्स लिमिटेड
Western Coalfields Limited
कंपनी सचिव का कार्यालय
Office of the Company Secretary
पंजी.का.: कोयला विहार, सिविल लाइन्स, नागपूर (महाराष्ट्र)-440001 email - companysecretary.wcl@coalindia.in
Regd. Off.: Coal Estate, Civil Lines, Nagpur (MS) – 440001 FAX: 0712 - 2511216
CIN - U10100MH1975GOI018626 www.westerncoal.in

BOARD MATTER
CONFIDENTIAL

REF: WCL/Office of CS/BM-345/2022-23/**499** DATE: 27.09.2022.

Reproduced below is the relevant excerpt from the minutes of 345th meeting of the Board of Directors of WCL held on 19th September, 2022:

वेकोलि/महाप्रबंधक (पर्या.)/मुख्यालय/नागपुर
WCL/GM (Env)/HQ/Nagpur
प्राप्ती/Rec. 433 दिनांक/Date 28/9/22

"ITEM NO.345/ C-9
SUB Approval for Mining Plan (including mine closure plan) July, 2022 for 2.5 MTY of Sasti Expansion OC, Ballarpur Area.

---

i) While deliberating on the subject brought out in the agenda note, Shri Anil Kumar Singh, Director (Technical) P&P apprised the salient features of Mining Plan of Sasti Expansion OC, Ballarpur Area.

ii) The Board, after deliberation, accorded approval to the Mining Plan including Mine Closure Plan of Sasti Expansion OC (July, 2022), Ballarpur Area to obtain EC with same capacity of 2.5 MTPA and same land area of 1120.48 Ha as per approved PR without any additional capital investment as brought out in the agenda note.

iii) General Manager (P&P) to take necessary action in the matter."

27/9/2022

COMPANY SECRETARY

GENERAL MANAGER (P&P)

CC: DIRECTOR (PERSONNEL)
DIRECTOR (TECHNICAL) OP
DIRECTOR (FINANCE)
DIRECTOR (TECHNICAL) P&P

GM (ENV)

वेस्टर्न कोलफील्ड्स लिमिटेड
Western Coalfields Limited
कंपनी सचिव का कार्यालय
Office of the Company Secretary
पंजी.का.: कोयला विहार, सिविल लाइन्स, नागपूर (महाराष्ट्र)-440001
Regd. Off.: Coal Estate, Civil Lines, Nagpur (MS) – 440001
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☎/FAX: 0712 - 2511216

BOARD MATTER
CONFIDENTIAL

REF: WCL/Office of CS/BM-324/2020-21/336 DATE: 17.08.2020

Reproduced below is the relevant excerpt from the minutes of 324th meeting of the Board of Directors of WCL held on 04th August, 2020:

"ITEM NO.324/ C-22
SUB Proposal for approval of Project report of Sasti Expansion OCP (June 2020) of Ballarpur Area.

---

i) While deliberating on the subject, Shri Ajit Kumar Chowdhary, Director (Technical) P&P apprised the salient features of the Project Report of Sasti Expansion OCP (June 2020) of Ballarpur Area to the Board.

ii) The Board, after deliberation, accorded approval to the Project Report of Sasti Expansion OCP (June, 2020) on total hiring option with a total capital investment of Rs. 371.5929 Crores (including WDV of Rs. 52.5488 Crores) for capacity of 2.5 MTY at a project specific price of Rs. 1708.75 / tonnes (95% of Rs. 1145/tonne for G-11 + Rs. 450 per tonne Premium + Rs. 87 per tonne as Processing Charge + Rs. 50 per tonne as Coal Evacuation Charge + Rs. 34 per tonne as STC) yielding 12.59% IRR at 85% capacity for Power Sector as brought out in the agenda note.

iii) GM (P&P) to take necessary action in the matter."

17/8/2020

COMPANY SECRETARY

GENERAL MANAGER (P&P)

CC: DIRECTOR (PERSONNEL)
DIRECTOR (TECHNICAL) OP
DIRECTOR (TECHNICAL) P&P
DIRECTOR (FINANCE)

AGM, BA

17/8/2020

STRICTLY RESTRICTED
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MINING PLAN

FOR

SASTI EXPANSION OC MINE (2.50 Mty)

(BALLARPUR AREA)

WESTERN COALFIELDS LIMITED

(JOB No. 4020422032)

(TEXT, PLATES & ANNEXURES)

JULY - 2022

CMPDI

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

AN ISO 9001 : 2015 COMPANY

MINING PLAN FOR SASTI EXPANSION OC MINE (2.50MTY)

(JULY, 2022)

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TEXT

MINING PLAN FOR SASTI EXPANSION OCM (2.50 Mty)

1.0 INTRODUCTION

Sasti OC mine is an operating mine in Sasti Geological block located in the eastern limb of the Wardha Valley Coalfield. The mine area falls under Ballarpur Area of WCL in the Rajura tehsil of Chandrapur district of Maharashtra state. The Chandrapur district township is located at the distance of about 25 km from the mine.

In Sasti area, MECL drilled 18 boreholes (WS-1 to WS-18) aggregating a total meterage of 2297.50 m during the year 1974-75 and submitted a GR namely "Geological Report on Exploration for coal in Sasti area, Wardha Valley Coalfield", Dist.–Chandrapur, Maharashtra" in August 1977. Subsequently, CMPDI drilled 19 boreholes during the period from 27.3.1980 to 3.6.1980 and from 29.11.1981 to 11.12.1981 covering a total of 1463.25m. Based on the exploration carried out by MECL and CMPDI, A GR namely "Geological Report on Exploration for coal in Sasti area, Wardha Valley Coalfield", Dist.-Chandrapur, Maharashtra was prepared by CMPDI in January, 1983.

Based on the above exploration, a Project Report of Sasti OC mine for target capacity of 1.0 Mty was prepared and approved in November, 1981 by Govt. of India for a total capital of Rs. 25.1483 crores. Subsequently, Govt. of India sanctioned an additional capital of Rs. 0.6604 crores towards payment of compensation of land. Thus, total capital sanctioned against PR was Rs. 25.8087 crores. The excavation work was started in 1985-86 and coal production commenced in 1986-87 against PR projection in 1983-84 and this delay was mainly due to land acquisition problem. The Revised Cost Estimate (RCE) of the PR was prepared for Rs. 66.7129 crores which was approved by Govt. of India in September, 1989. The Completion Report of the project was prepared by WCL for Rs. 71.8594 crores as on 31.03.1991 which was approved by WCL Board.

In 1990, MECL commenced exploratory drilling in the area up dip side of Sasti opencast mine for proving repetition of seam due to fault. Total 20 boreholes were drilled by MECL during the period from 28.6.90 to 25.4.1991 with a total 1104.35 m drilling and a GR namely "Geological report on Exploration for coal Sasti Opencast Block, Wardha Valley Coalfield, Dist – Chandrapur, Maharashtra" was submitted in March, 1992**.**

Keeping in the view the further expansion of mine, the virgin area in the dip side was identified by CMPDI for regional exploration and as well as production support drilling. Accordingly MECL commenced the exploratory drilling in dip side area and total 36 boreholes with a total of 8458.95 m of drilling were drilled during the period from 14.1.1987 to April 1991. A GR namely "Geological Report on Exploration for coal in Mathra Block, Wardha Valley Coalfield, Dist – Chandrapur, Maharashtra" was submitted by MECL in September, 1992 for dip side area lying between Sasti and Mathra nalla. Subsequently, four boreholes with a total meterage of 216.25 m and seven boreholes covering a total meterage of 946.6m were drilled by colliery and CMPDI respectively in this area and a note namely "Geological Note on Production Support drilling Sasti UG mine area" was submitted in Dec., 2019.

As the Sasti OC mine was reaching the approved PR limit, a Scheme for Sasti OC Extension was prepared in May, 2004 by extending the mine in dip side covering entire Sasti block and part area of Mathara block. The Scheme envisaged target capacity of 1.40 Mty upto a depth of 150m and total life of 20 years. It was approved by WCL Board in November, 2004 for additional capital investment of Rs. 16.8020 crores. The present Sasti OC mine is being operated as per the approved Scheme. Subsequently, WCL Board in its 189th meeting sanctioned the enhanced capacity of 1.60 Mty for the mine. The capacity of the mine was further enhanced through administrative approval by WCL Board (ref. no. WCL/BD/SECTT/BM-194/2006/5916) in its 194th meeting held in January, 2006 to obtain EC for 2.50 Mty. The Environmental Clearance was granted by MoEF & CC vide ref no. J-11015/435/2006-IA.II(M) for 2.50 Mty capacity on 17th May, 2007.

The balance coal and OB in the existing Scheme of Sasti OC Extension mine as on 01.04.2019 were 4.54 Mt and 34.45 Mm^3 respectively which were likely to be exhausted by 31.03.2022. To continue the production from existing Sasti OC mine beyond 01.04.2022 and utilization of existing 20/90 Walking Dragline, the Expansion PR for Sasti OCM was prepared in June, 2020, which proposed the further expansion of mine from approved Scheme limit of 150 m depth to 200 m depth at the floor of Composite coal seam in Mathra Geological Block. The existing Sasti railway siding was falling over coal bearing area of sasti block in the western side of Sasti OC mine. It was proposed to shift this railway further west beyond boundary Fault F8-F8, which would provide another patch which can be operated by Shovel-Dumper combination as Dragline deployment would be difficult due to upthrow fault. This additional patch would have added to the existing production and therefore the target capacity of proposed Sasti Expansion OC mine was enhanced to 2.50 Mty from both Dragline & Shovel-Dumper combination. This PR for Sasti Expansion OCM (June, 2020) was approved in 324th meeting of WCL Board held on 04.08.2020 (enclosed in Annexures) in Total hiring option with departmental Dragline in operation.

Now keeping the same mining parameters as per the approved PR for Sasti Expansion OCM (June, 2020), the proposed Mining Plan has been prepared in July, 2022 considering the following modifications suggested by WCL (enclosed in Annexures) :

1. As desired by WCL, the dragline is to be surveyed off on completion of its working hours/life and its deployment was proposed to be discontinue by end of 2021-2022, hence this Mining Plan has been prepared without considering the working of 20/90 Dragline.

2. The coal extraction has been proposed by deployment of Surface Miner in order to improve the quality of coal with reduction in environmental degradation.

3. The diversion of Gauri Nala and widening of Sakhri Nala has been proposed as per the design note prepared by CDO Nashik.

Chronology of the previous approved reports are as follows:-

Sl. No.	Name of PR	Year of Approval	Production Capacity (MTPA)	Approved Capital (Rs. Crores)
1	Project Report of Sasti OC mine, November, 1981	November, 1981 (By Govt. of India)	1.00	25.1483 (25.8087 after sanction of addl. Capital of Rs. 0.6604 crores)
2	Revised Cost Estimate (RCE) of Sasti OC mine	September, 1989 (By Govt. of India)	1.00	66.7129
3	Completion Report of Sasti OC mine as on 31.03.1991	Approved by WCL Board	1.00	71.8594
4	Scheme of Sasti OC Extension mine, May 2004	November, 2004 (By WCL Board)	1.40	16.8020
5	Administrative Approval for 2.50 Mty Mine Capacity to obtain EC.	January, 2006 (By WCL Board)	2.50	-
6	Project Report of Sasti Expansion OCM, June 2020	August, 2020 (By WCL Board)	2.50	371.5929

Details of environmental clearance granted to Sasti OC has been given in below table

SNo.	Name of the Project	Capacity (Mt)	EC letter no. and date
1	Sasti OC	1.00	J-11015/24/84-IA dt 03.04.1989
2	Sasti Expansion OC	1.60	J-11015/97/2003-IA.II (M) dt 19.05.2005
3	Sasti Expansion OC	2.50	J-11015/435/2006-IA.II (M) dt 17.05.2007

1.2 EXISTING STATUS OF MINE

1.2.1 PRODUCTION

The excavation work in Sasti OC mine was started in 1985-86 and coal production commenced in 1986-87. Year-wise coal extraction and OB removal from Sasti OC mine since inception are tabulated below :

Sl. No	Year	Coal (Mt)		OB (Mm^3)	
		Yearly	Cum.	Yearly	Cum.
A) SASTI OC MINE					
1	1985-86	-	-	0.35	0.35
2	1986-87	0.05	0.05	0.84	1.19
3	1987-88	0.40	0.45	1.54	2.73
4	1988-89	0.75	1.20	2.03	4.76
5	1989-90	1.25	2.45	2.96	7.72
6	1990-91	1.47	3.92	2.59	10.31
7	1991-92	1.91	5.83	3.40	13.71
8	1992-93	1.80	7.63	3.62	17.33
9	1993-94	1.76	9.39	3.23	20.56
10	1994-95	1.86	11.25	3.87	24.43
11	1995-96	2.02	13.27	4.44	28.87
12	1996-97	1.91	15.18	5.26	34.13
13	1997-98	1.80	16.98	4.95	39.08
14	1998-99	1.20	18.18	5.81	44.89
15	1999-00	1.42	19.60	5.15	50.04
16	2000-01	1.41	21.01	6.71	56.75
17	2001-2002	1.29	22.30	6.40	63.15
18	2002-2003	1.41	23.71	5.05	68.20
19	2003-2004	1.42	25.13	5.00	73.20
B) SCHEME OF SASTI OC EXTENSION					
20	2004-2005	1.41	26.54	4.86	78.06
21	2005-2006	1.51	28.05	5.32	83.38
22	2006-2007	1.46	29.51	5.18	88.56
23	2007-2008	1.46	30.97	10.68	99.24
24	2008-2009	1.68	32.65	5.76	105.00
25	2009-2010	1.70	34.35	5.38	110.38
26	2010-2011	1.59	35.94	9.55	119.93
27	2011-2012	1.64	37.58	8.73	128.66
28	2012-2013	1.55	39.13	5.75	134.41

Sl. No	Year	Coal (Mt)		OB (Mm^3)	
		Yearly	Cum.	Yearly	Cum.
29	2013-2014	1.58	40.71	9.46	143.87
30	2014-2015	1.74	42.45	10.00	153.87
31	2015-2016	1.73	44.18	7.34	161.21
32	2016-2017	1.62	45.8	8.06	169.27
33	2017-2018	1.57	47.37	11.75	181.02
34	2018-2019	1.63	49.00	9.95	190.97
35	2019-2020	1.69	50.69	12.48	203.45
36	2020-2021	1.46	**52.48**	10.47	**213.92**
37	2021-2022	1.79	**54.27**	4.47	**218.39**

1.2.2 EXISTING LAND

The total land acquired in the existing Sasti OC mine is tabulated below :

Sl. No.	Land Type	Area (Ha)
1	Forest Land	0.00
2	Tenancy Land	899.44
3	Govt. Land	20.20
Total		**919.64**

The existing land use pattern is shown below:

Sl. No.	**Particulars**	**Area (ha)**
1	Entire Quarry Area	344.00
2	External OB dump including top soil dump	215.03
3	Infrastructure including Railway Siding and Road	74.52
4	Embankment	32.72
5	Area needed for rationalization including safety and blasting zone	253.37
	Total Land	**919.64**

1.2.3 EXISTING MANPOWER

The departmental manpower deployed in Sasti OC as on 01.04.2022 is 737. (Executives-37 and Non-Executives-700).

1.2.4 EXISTING ENVIRONMENT CLEARANCE

The existing Sasti OC mine has been granted environment clearance by MoEF& CC vide ref no. J-11015/435/2006-IA.II (M) Dt. 17.05.2007 for production capacity of 2.50 Mty within land area of 919.69 ha.

Application for Grant of TOR was applied in October 2020 based on the Approved Project Report of Sasti Expansion OC (2.50 Mty) June 2020. The details are shown below:

	Name of the Project	Capacity (Mt)	ML Area (ha)	TOR Letter no. and date
1	Sasti Expansion OC	2.50	1120.48	The ToR was issued by MoEF&CC vide No. J-11015/435/2006-IA.II(M) dated 02/01/2021

2.1 JUSTIFICATION AND MARKETABILITY

1) The present Sasti OC mine is being operated as per the approved Scheme of Sasti OC Extension mine and has been exhausted in the financial year 2021-22. To continue the production from the mine beyond the approved Scheme limit after 01.04.2022, the PR of Sasti Expansion OC mine, June 2020 is approved and additional land acquisition is already in process.

2) As desired by WCL, Dragline is to be surveyed off/ grounded off on completion of its working hours/life . As per the Survey-off Norms of HEMM vide letter no. CIL/D(T)/EED/2019/1213 Dt 31.05.2019 (enclosed as annexure) the minimum eligibility criteria for survey-off of 15-20 m^3 Walking Dragline is 30 years / 1,40,000 hours. The 20/90 Dragline was commissioned on 17.06.1992 and as on 01.04.2021, it has completed total working hours of 1,68,350 hours and 30

years of life will be over by 16.06.2022. Hence, WCL has decided that 20/90 Dragline is to be surveyed off on completion of its working hours/life and its deployment will discontinue from 2022-23. Hence, this Mining Plan for Sasti Expansion OC mine has been prepared for an enhanced target capacity of 2.50 MTPA by excluding Dragline working.

3) As per the approved scheme (2004) of existing Sasti OC Extension mine, there was diversion of Gauri Nala (1.50 km) and widening of Sakhari Nala (1.50 km). This diversion was not done till 2020 and was not considered in the approved PR of Sasti Expansion OCM (2020). As the Sakhari nala has been diverted to Pauni nala wich connects to Gauri Nala at Pauni-II Expn. OC due to which the inflow of Guari Nala has increased, hence in this Mining Plan it is again proposed to divert the Gauri nala and widening of Sakhari nala as per the design note for diversion of Gauri nala and widening of Sakhari nala prepared by Central Designs Organisation (C.D.O) Nashik in April 2016. The proposed route has been shown in Quarry and surface layout plan.

4) The mines of WCL are under constant pressure to meet the increasing demand of non-coking coal for power houses and other bulk consumers from Western as well as Southern part of country. The enhanced production from the proposed Sasti Expansion OC mine will help in reducing the gap between demand and supply of non-coking coal for power sector

Hence, the preparation of Mining Plan of Sasti Expansion OC mine for 2.50 Mty capacity is justified.

Following table shows the deficit in availability of coal, including middling, from the various Existing, Completed, On-going, and Future Projects of WCL:

Demand, Supply and Deficit in Availability of Coal

Sl. No.	Sector	Projections of Surplus / Deficit of Coal (Mt)	
		2022-23	2023-24
1	Total FSA/LOA Commitment + E-Auction	86.07	83.27
2	Availability of coal	62.00	64.00
3	Surplus / Deficit (+/-)	(-) 24.07	(-) 19.27

From the above table, it is clear that the deficit in supply of coal from WCL is (-) 24.07 Mt in 2022-23 which will be narrowed down to (-) 19.27 Mt in 2023-24, if WCL achieves the target capacity of 64.00 Mt in 2023-24.

Considering all above factors, WCL will have no difficulty to market the coal of 2.50 Mty produced by Sasti Expansion OC mine.

3.1 LOCATION OF MINE & COMMUNICATION

The proposed Sasti Expansion OC mine is dip side extension of existing Sasti OC mine in combined Sasti and Mathra geological block located in the eastern limb of the Wardha Valley Coalfield. The mine area falls under Ballarpur Area of WCL in the Rajura tehsil of Chandrapur district of Maharashtra state. The Chandrapur district township is located at the distance of about 25 km from the mine. Sasti block is bounded by Latitude N 19^0 47' 55" and 19^0 49' 32" and Longitude E 79^0 18' 09" and 79^0 19' 30" whereas Mathra block is bounded by Latitude N 19^0 47' 05" and 19^0 48' 03" and Longitude E 79^0 19' 05" and 79^0 20' 26". Both the blocks are covered in the survey of India Toposheet No. - 56 M/5 (RF: 1: 50000).

The Sasti Mathra combined block is approachable from Rajura town (8km) via Sasti Colliery and from Ballarpur via. Rajura (4km) by metalled road. Rajura is located in south east side of both the blocks and is connected to Ballarpur. The Ballarpur, in turn, is connected to Nagpur (160km) by State Highway no.85 via. Chandrapur and Warora. Ballarshah Railway station is located at a distance of about 8 km from the block The proposed area is also approachable from Manikgarh Railway station situated in south eastern side at a distance of around 10 km.

3.2 TOPOGRAPHY, DRAINAGE & CLIMATE

The area is characterized by gently undulating topography, covered by agriculture land with black cotton soil. The area around BH no. – MWS065 and 14, along southern & Western limits of the block, forms the elevated ground. The block has in general gentle slope towards north and south i.e. towards sasti and mathra nalla. The altitude of the area ranges between

171.69m (WMWS158) and 189.74 m (WS16) from mean sea level. The main drainage of the area is controlled by the Wardha River, which is flowing southerly and is located about 2 km north from the area. The Gauri nala controls the local drainage system. The Sasti and Mathra nalla join together in the north eastern area outside of the block. The nalla in the further east of the confluence of Sasti and Mathra nalla is called Dhupthala nalla. The H.F.L. of the Wardha River as recorded by Sasti Colliery in year 1959 is 178.5m.

3.3 LAND-USE PATTERN

The Mathra village is located over coal bearing area in the dipside of Mathra Block close to Mathra Nala and adjacent to the geological block boundary. Most of the land is agriculture land and the main crops are rice, cotton jowar etc.

4.1 GEOLOGY

Regional geological and geophysical surveys by Geological survey of India and exploration through drilling by GSI, DGM (MS), MECL, CMPDIL and Colliery were carried out in the area from time to time.

In Sasti area, MECL drilled 18 boreholes (WS-1 to WS-18) aggregating a total meterage of 2297.50m during the year 1974-75 and submitted a GR namely "Geological Report on Exploration for coal in Sasti area, Wardha Valley Coalfield", Dist.–Chandrapur, Maharashtra" in August 1977. Subsequently, CMPDI drilled 19 boreholes during the period from 27.3.1980 to 3.6.1980 and from 29.11.1981 to 11.12.1981 covering a total of 1463.25m. Based on the exploration carried out by MECL and CMPDI, A GR namely "Geological Report on Exploration for coal in Sasti area, Wardha Valley Coalfield", Dist.–Chandrapur, Maharashtra" was prepared by CMPDI in January, 1983.

In 1990, MECL commenced exploratory drilling in the area up dip side of Sasti opencast mine for proving repetition of seam due to fault. Total 20 boreholes were drilled by MECL during the period from 28.6.90 and 25.4.1991 with a total 1104.35 m drilling and a GR namely "Geological report on Exploration for coal Sasti Opencast Block, Wardha Valley Coalfield, Dist – Chandrapur, Maharashtra" was submitted in March, 1992.

Keeping in the view the further expansion of Sasti OC mine, the virgin area in the dip side was identified by CMPDI for regional exploration as well as production support drilling. Accordingly, MECL commenced the exploratory drilling in dip side area and total 36 boreholes with a total of 8458.95 m of drilling were drilled during the period from 14.1.1987 and April 1991. A GR namely "Geological Report on Exploration for coal in Mathra Block, Wardha Valley Coalfield, Dist – Chandrapur, Maharashtra" was submitted by MECL in September, 1992 for dip side area lying between Sasti and Mathra nalla.

Subsequently, four boreholes with a total meterage of 216.25 m and seven boreholes covering a total meterage of 946.6m were drilled by Sasti colliery and CMPDI respectively in this area and a note namely "Geological Note on Production Support drilling Sasti UG mine area" was submitted in Dec., 1994.

The geology of the area under consideration is based on the following geological reports :

1) Geological Report on Exploration for coal in Sasti area, Wardha Valley Coalfield", Dist.–Chandrapur, Maharashtra, August, 1977.

2) Geological report on Sasti OC area, Wardha Valley Coalfield, Dist. – Chandrapur, Maharashtra, Jan' 1983.

3) Geological report on Exploration for coal Sasti Opencast Block, Wardha Valley Coalfield, Dist – Chandrapur, Maharashtra, March, 1992.

4) Geological note on Production Support drilling, Sasti UG mine area, December 1994.

5) Geological report on Exploration for coal in Mathra Block, Wardha Valley Coalfield, Dist – Chandrapur, Maharashtra, September, 1992.

4.1.1 GEOLOGICAL BLOCK BOUNDARY

The proposed Sasti Expansion OC mine has been planned in the Sasti Rationalized block. The rationalized block consists of Sasti, Mathra and

Mathra deep sub-blocks and dipside area upto appx. 600m depth line. The area under consideration covers two sub blocks Sasti and Mathra.

Sasti Block

North : The Southern Bank of Gauri nalla

South : Northern boundary of Mathra Block

East : Seam position against fault F1 - F1

West : The eastern banks of Gauri nalla and Seam position against Fault F8 - F8

Mathra Block

North : Southern boundary of Sasti Block

South : Sothern Bank of Mathra nalla as well as an arbitrary line 200m south of line joining peripheral boreholes MWS065,14 & 64

East : The Eastern Bank of Mathra nalla and Seam position against fault F_1- F_1

West : Seam Position against Fault F_8- F_8 & F_7- F_7

4.2 EXPLORATION STATUS

The detailed exploration in the proposed area has been carried out by MECL, CMPDI and Colliery in different phases as detailed below :

Sl. No.	Agency	No. of Boreholes	Meterage (m)	Series
1	MECL	72	11278.35	WS, MWS
2	CMPDI	26	2409.85	CMWS
3	COLLIERY	4	216.25	CMA
	TOTAL	**102**	**13904.45**	

Total 102 boreholes were drilled in an area of about 9.26 sq. km and the borehole density works out to about **11 Bhs./Sq.km**. The block wise borehole details are tabulated below :

Sl. No.	Particulars	Sasti	Mathra	Total (Sasti + Mathra)
1	Area of Geological Block	5.29	3.97	9.26
2	No. of Boreholes Drilled	66	36	102
3	Boreholes Density	12.48	9.07	11.01

4.3 GEOLOGICAL STRUCTURE

Strike & Dip

Study of floor contour plans of Top, Middle and Bottom sections of Composite seam shows that there is a lot of variation in strike in Mathra Block. It varies in general, from N22^0 - 60^{0}E to S22^0 - 60^0 W. However, in the southern part it is almost E-W. The dip, in general varies from 5^0 - 8^0 and gradient 1 in 7.4 to 1 in 13 due SE. While in case of Sasti Block, the strike varies from N 30^0 E to S 30^0 W with local swing near boreholes MWS165, MWS170 and 172. The dip, in general, ranges between 3^0 to 5^0 and gradient 1 in 13 to 1 in 18 due SE.

Faults

The area of the block is traversed by total 16 no. of normal faults. Almost all the faults are oblique in nature except F8, F7 & F2 which are dip faults. However, there are three strike faults namely F1b, F1b (1) and F3. Due to thick cover of Soil/Kamthi rocks, none of the faults are visible on the surface. Therefore, their presence has been interpreted from the direct evidence generated through boreholes drilled in the area. Faults have been intePReted by direct evidences. i.e. omission of full or part of seam, reduction in parting between the seams and indirect evidence. i.e. through difference in floor-reduced-levels on either side of the fault. All the faults have been considered as Pre-Kamthis and therefore, their surface position has been projected below the floor of Kamthi Formation.

The details of faults are tabulated below:

Brief Description of Faults within the blocks

Fault No.	Trend	Throw		Evidence
		Direction	Amount (m)	
F1-F1	NW-SE	SW	90-160m.	Truncation of seam in BH No, CMWS-10. Shallow interception of seam in CMWS-16. This is the boundary fault between the block and adjacent Dhuptala block (Sasti mines)
F2-F2	NNW-SSE E	E	30 m	Dip fault IntePReted on the basis of boreholes data MWS - 159, 160, 3, 162, 121 and MWS-4, 79, 84 & on either side of the fault
F3-F3	NE-SW	NW	5-15 m	Truncation of upper part of seam in BH No. CMWS-12. Difference, in FRLs of BH Nos. CMWS-8, 12 and WS-5 in upthrown block and CMWS-4,17 and WS-8 in downthrown block
F4-F4	E-W	S	5-45 m	Absence of seam in BH No. WS – 1 and truncation of lower part of seam Difference in FRLs of BH Nos. CMWS-5,8 and WS-4,14 in upthrown block and CMWS-9 ,29 and CMA-19 in downthrown block
F4a-F4a	E-W	S	8 m	Difference in FRLs of BH Nos. CMWS-4 and WS-15, 18 in upthrown block and CMWS-5 WS08 and CMA-17 in downthrown block
F5-F5	E-W	S	10 m	Absence of seam in BH No.WS-1 and truncation of lower part of seam Difference in FRLs of BH Nos. CMWS-28 and CMA-19 in upthrown block and CMWS - 9, 22 and in downthrown block
F5-F5	E-W	S	10 m	Absence of seam in BH No.WS-1 and truncation of lower part of seam Difference in FRLs of BH Nos. CMWS-28 and CMA-19 in upthrown block and CMWS - 9, 22 and in downthrown block
F1b-F1b	NE-SW	NW	15m.	Strike fault, Repetition of subcrop Difference in FRLs of BH Nos. CMWS-2, 3, 18 and WS-18 in upthrown block and MWS-142,145 and 158 in downthrown block

Fault No.	Trend	Throw		Evidence
		Direction	Amount (m)	
F1b (1)-F1b (1)	NE-SW	NW	10m	Strike fault, Repetition of subcrop Difference in FRLs of BH Nos. MWS-127, 143 and MWS-149 in upthrown block and MWS-128 and 150 in downthrown block
F6-F6	NW-SE	SW	15 m	Oblique fault, Difference in FRLs of BH Nos. CMWS - 24, 20 and WS-3 in upthrown block and CMWS-28, 30 and WS-13 in downthrown block
F6a-F6a	E-W	NNE	5-45 m	Absence of lower seam in BH No. MWS-1. Difference in FRLs of BH Nos. MWS-160, 41and CMWS-21 in upthrown block and CMWS-30, MWS-42 and WS-13 in downthrown block
F7-F7	NNW-SSE to NS	E	5-50 m	Dip fault. IntePReted on the basis of boreholes WS-17, MWS- 44, WS-11, MWS-50, 171, l37 etc. Omission of Top section of BH WS-17 outside the block.
F8-F8	NNW-SSE to NS	W	60-120m	Dip fault IntePReted on the basis of data of boreholes MWS-65, within block and MWS-7, 137, 171, 46 outside the block. Omission of all sections of composite seam in borehole MWS-137
F9-F9	Almost E-W	N	5m.	Oblique fault. IntePReted on the basis of borehole data MWS-148,161 , 117
F10-F10	Almost E-W	N	10m	Oblique fault. IntePReted on the basis of borehole data MWS-148, 120, 117 within block & MWS-151 outside the block. Omission of Bottom section in BH MWS-117.
F11-F11	Almost E-W	N	15m	Oblique fault, Difference in FRLs of BH Nos. MWS-5, 25 and CMWMA - 21 in downthrown block and CMWMA-33, 36, 50 and MWS-21 in upthrown block
F12-F12	NNE-SSW	N	5m	Oblique fault, Difference in FRLs of BH Nos. MWS-66 in upthrown block and MWS-64 in downthrown block

4.4 COAL SEAMS

In Wardha valley Coalfield one thick composite seam occurs in the middle part of Barakar formation comprising sandstones and shales. The thickness of

Composite seam ranges from 15 to 20m. The Composite Seam splits into three sections viz. Top section, Middle section and Bottom section separated by sandstones, shale, intercalations of sandstone and shale, arenaceous and carbonaceous shale parting. In very few boreholes Middle section splits into two namely Upper Middle section and Lower Middle section.

The total thickness of coal including Top, Middle and Bottom section varies from 11.84m (MWS064) to 19.73m (MWS077) in the project area. The parting between Composite Top Section and Composite Middle Section varies from 1.26 m to 3.45 m and between Composite Middle section and Composite Bottom section varies from 2.56m to 4.73m. The above potential sections occur in the area in the depth range of 26.05 m (CMWS03) to 310.6 m (MWS064) as per data of boreholes drilled in the blocks. The present mining activity is going on in the southern part of Sasti block and northern part of Mathra block.

Details of Composite Top Section

General Parameters	**Range**	
	Minimum	**Maximum**
Borehole intersections	71 boreholes	
Full seam intersections	49 boreholes	
Part thickness due to incrop	4 boreholes	
Boreholes where seam is faulted/part drilled/deterioration/reduced thickness/ washed/core loss/visual : 14boreholes		
Depth Range of Roof	26.05 m (CMWS03)	286.15 m (MWS166)
Seam thickness Range	0.83 (MWS172)	3.18m (MWS004)
Parting Thickness with Composite Middle Section	1.26m	3.45m
Quality Parameters	**I-100**	
	Minimum	**Maximum**
Moisture %	5.5	7.6
Ash %	21.4	40.6
GCV (k.Cal./kg)	3941	5440
UHV (kCal/kg)	2546	4906
GCV Band	G12	G7

General Parameters	Range	
	Minimum	**Maximum**
Average Quality		
Moisture %	6.7	
Ash %	29.7	
GCV (kCal/kg)/Band	4789/G9	
UHV (kCal/kg)/Grade	3880/E	

Details of Composite Middle Section

General Parameters	Range	
	Minimum	**Maximum**
Borehole intersections	80 boreholes	
Full seam intersections	73 boreholes	
Part thickness due to incrop	1 boreholes	
Boreholes where seam is faulted/part drilled/deterioration/reduced thickness/ washed/core loss/visual: 6 boreholes		
Depth Range of Roof	15.09 m (MWS145)	304.52 m (MWS064)
Seam thickness Range	3.8m (MWS156)	10.33m (MWS077)
Parting Thickness with Composite Bottom Section	2.56m	4.73m
Quality Parameters	**I-100**	
	Minimum	**Maximum**
Moisture %	6.3	Moisture %
Ash %	15.3	Ash %
GCV (k.Cal./kg)	4449	GCV (K.Cal./Kg)
UHV (kCal/kg)	3351	UHV (kcal/kg)
GCV Band	G10	GCV Band
Average Quality		
Moisture %	7.3	
Ash %	24.3	
GCV (kCal/kg)/BAND	5158/G8	
UHV (kCal/kg)/GRADE	4465/D	

Details of Composite Bottom Section

General Parameters	Range	
	Minimum	**Maximum**
Borehole intersections	79 boreholes	
Full seam intersections	76 boreholes	
Part thickness due to incrop	NIL	
Boreholes where seam is faulted/part drilled/deterioration/reduced thickness/ washed/core loss/visual: 3 boreholes		
Depth Range of Roof	14.00 m (MWS158)	308.11 m (MWS064)
Seam thickness Range	1.71 m (MWS138)	5.54 (MWS142)
Parting Thickness with Composite Middle Section	2.56m	4.73m
Quality Parameters	**I-100**	
	Minimum	**Maximum**
Moisture %	5.9	Moisture %
Ash %	17.3	Ash %
GCV (k.Cal./kg)	3953	GCV (k.Cal./kg)
UHV (kCal/kg)	2594	UHV (k.Cal./kg)
GCV Band	G12	GCV Band
Average Quality		
Moisture %	7.6	
Ash %	25.2	
GCV (kCal/kg)/BAND	5099/G8	
UHV (kCal/kg)/GRADE	4405/D	

4.5 GEOLOGICAL RESERVES

Sasti Block

A total of 62.74 Mt. of net proved resource of Composite Seam (Top Section + Middle Section + Bottom Section) have been estimated in Sasti Block. Out of

62.74 Mt, 28.61Mt belong to G8 and 15.48Mt to G9 band and rest belong to other bands.

Mathra Block

A total of 54.57 Mt. of net proved resource of Composite Seam (Top Section + Middle Section + Bottom Section) have been estimated in Mathra Block. Out of 54.57 Mt, 19.78 Mt belong to G8 and 17.71Mt to G9 band and rest belong to other bands. Around 2-3% of total area of Mathra block is covered by forest land. Therefore, resources have been estimated for both under forest and non-forest land.

The entire geological resources of the two blocks are tabulated below:

Geological Resources in Sasti and Mathra Block

Block	Seam/Section	Net Proved Geological reserves (Mt)
Sasti	Top Section	18.66
	Middle Section	29.86
	Bottom Section	14.22
Sub-total (Sasti Block)		**62.74**
Mathra	Top Section	11.78
	Middle Section	28.68
	Bottom Section	14.11
Sub-Total (Mathra Block)		**54.57**
Grand Total (Sasti + Mathra)		**117.31**

Geological Resources of Mathra Block

Sl. No.	Seam	Net Proved Geological Reserves (Mt)		
		Non- Forest	Forest	Total
1	TS	11.49	0.29	11.78
2	MS	28.05	0.63	28.68
3	BS	13.50	0.61	14.11
Total		**53.04**	**1.53**	**54.57**

4.6 COAL QUALITY

The detailed exploration of project area reveals the existence of three sections of composite seam namely Top Section, Middle section and Bottom section separated by sandstones, shale, intercalations of sandstone and shale, shale arenaceous and carbonaceous shale parting. In very few boreholes Middle section splits into two namely Upper Middle section and Lower Middle section. The total thickness of coal including Top, Middle and Bottom section varies from 11.84m (MWS064) to 19.73m (MWS077) in the project area. The parting between Composite Top Section and Composite Middle Section varies from 1.26 m to 3.45 m and between Composite Middle section and Composite Bottom section varies from 2.56m to 4.73m.

The effective thickness, overall quality and geological resources for Top Section, Middle section and Bottom Section have been assessed on I100 basis i.e. including only coal, shaly coal and carbonaceous shale bands up to 1.00m. All other bands irrespective of thickness and nature have been excluded from the seam thickness. The overall analysis on 60% RH & 400^{o} C has been determined for few boreholes for each of the seams and for the remaining boreholes, the analysis on equilibrated basis has been calculated (by using M100 values).

The Coal quality of Combined Sasti & Mathra Block been assessed on I100 basis and the summarised Quality is given below :

Coal seam / Parting	Thickness Range(m)		Average Thickness (m)	Average GCV kCal/kg
	Minimum	Maximum		
Composite Top Section	0.83 (MWS172)	3.18 (MWS004)	1.90	4789 (G9)
Parting	1.26	3.45	2.26	
Composite Middle Section	3.8 (MWS156)	10.33 (MWS077)	6.69	5158 (G8)

Coal seam / Parting	Thickness Range(m)		Average Thickness (m)	Average GCV kCal/kg
	Minimum	Maximum		
Parting	2.56	4.73	2.76	
Composite Bottom section	1.71 (MWS138)	5.54 (MWS142)	4.17	5099 (G8)

5.1 QUARRY BOUNDARY

East : The eastern quarry floor has been limited upto Fault F1-F1 and accordingly quarry surface boundary has been planned with proper angle of batter. In south-eastern side, the eastern quarry surface limit has been envisaged leaving safe distance from adjoining proposed Dhuptala OC mine and accordingly quarry floor limit has been planned with proper angle of batter.

West : The western quarry floor has been limited upto Fault F8-F8 and accordingly quarry surface boundary has been planned with proper angle of batter.

North : The existing northern quarry boundary of Sasti OC mine will be the northern quarry boundary of proposed Sasti. Expn.OC mine.

South : The southern quarry floor has been limited upto 200m depth at the floor of Composite bottom section and accordingly southern quarry surface boundary has been planned with proper angle of batter.

5.2 MINEABLE RESERVES

The seam-section wise mineable reserves in the approved PR of Sasti Expansion OC mine (June 2020) was assessed as on 01.04.2022 hence same mineable reserves has been considered in the proposed Mining Plan as tabulated below :

Sl. No.	**Seam-Section**	**Mineable Reserves (Mt)** (Considering 10% Geological loss & 5% Mineable Loss)
1	Top section of Composite Seam	4.23
2	Middle section of Composite Seam	13.76
3	Bottom section of Composite Seam	6.13
	Total Mineable Reserves	**24.12**

NET MINEABLE RESERVES AS ON 01.04.2022

The coal reserves of existing Scheme of Sasti OC Extension mine have been exhausted by 31.03.2022. The first year of proposed Mining Plan for Sasti Expansion OC has been considered as 2022-23 and the coal reserves as on 01.04.2022 works out to 24.12 Mt.

5.3 LIFE OF THE MINE

The total mineable reserves in proposed Sasti Expansion OC mine is 24.12 Mt. Considering the proposed rated output of mine as **2.50 Mty** of ROM Coal, the total life of the mine is estimated as **11 years** .

The break-up of mine life is as under:

Land Acquisition	:	0 years
Production Build-Up Period	:	3 years
Target Production Period	:	6 years
Tapering Production Period	:	2 year
Total Mine Life	**:**	**11 years**

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6.1 GEO-MINING PARAMETERS

Sl. No.	Particulars	Sasti Expansion OC
1.	Area of the Quarry	
a)	On floor (ha)	416.47 (134.40 in Expn. part)
b)	On surface (ha)	544.79 (194.85 in Expn. part)
2.	Depth (m) (Incl. Sasti OC)	
a)	Initial	30m
b)	Final	200
3.	Gradient of Seam	1 in 7.4 to 1 in 18 due SE
4.	Average thickness range of seams (m)	11.84 to 19.73
5.	Average Strike length (m)	1650
6.	Width on surface (m) [dip rise] (Expn Area)	725
7.	Width on floor (m) [dip rise] (Expn. Area)	650
8.	Grade and GCV (kCal/kg) (considering 0.10 m dilution at Roof & Floor of seam)	G9 (4850 kCal/kg) By Surface Miner
9.	Mineable Reserves (Mt) (As on 01.04.2022)	24.12
10.	Total OB (Mm^3)	228.38
11.	Average stripping ratio (m^3/t)	9.47

6.2 EQUIPMENT SELECTION

In the existing Sasti OC mine, a combination of Dragline and Shovel Dumper system of mining was practiced. Dragline was deployed to expose the Coal by removing about 25-28 m OB from top of the Coal Seam. The balance Top OB, Coal and Parting OB were removed by Shovel Dumper combination.

However as directed by WCL, the Dragline is proposed to be surveyed off by 31.03.2022, hence it is proposed to discontinue the deployment of Dragline in Sasti Expansion OC mine for removal of 25-28m OB from top of the coal seam from 2022-23. Moreover, the existing practice of deployment of shovel-dumper combination for coal extraction is proposed to be replaced with introduction of Surface miner in this Mining Plan to improve the coal quality with reducing the adverse effect on environment by removing drilling and blasting in coal seam. The entire Top OB and parting OB are proposed to be removed by Shovel-Dumper combination.

7.1 CONSTRAINTS ON MINE DEVELOPMENT

Various surface constraints involved in the proposed Mining Plan are detailed below:

1) Land Acquisition

Total land within the mine boundary of existing Sasti OC mine is 919.64 ha. It is proposed in this Mining Plan to extend the mine in western side upto Fault F_8-F_8 & in the dip side upto 200m depth which will require additional 228.84 ha land. In the approved PR of Dhuptala OC mine (Sasti UG to OC mine), around 39.70 ha land was proposed to be transferred to Dhuptala OC mine from Sasti OC mine. In the approved PR of Sasti Expansion OC mine 11.70 ha land is proposed to be transferred from Dhuptala OC mine to Sasti OC mine. Hence total area within the mine boundary of proposed Sasti Expansion OC mine will be 1120.48 ha (919.64 – 39.70 + 11.70 + 228.84). Acquisition of land is one of the critical activities for the development of the proposed Expansion project.

2) Diversion of Gauri Nala & widening of Sakhari Nala

As per the approved scheme (2004) of existing Sasti OC Extension mine, there was diversion of Gauri Nala (1.50 km) and widening of Sakhari Nala (1.50 km). This diversion was not done till 2020 and was not considered in the approved PR of Sasti Expansion OCM (2020). As the Sakhari nala has been diverted to Pauni nala wich connects to Gauri Nala at Pauni-II Expn. OC due

to which the inflow of Guari Nala has increased, hence in this Mining Plan, it is again proposed to divert the Gauri nala and widening of Sakhari nala as per the design note for diversion of Gauri nala and widening of Sakhari nala prepared by Central Designs Organisation (C.D.O) Nashik in April 2016. The proposed route has been shown in Quarry and surface layout plan.

3) Diversion of Sasti Nala

As per the approved scheme of existing Sasti OC Extension mine, the dip side southern quarry surface was limited by the Sasti nala. A small portion of Sasti nala which was falling inside the quarry of the Scheme has already been realigned in the dipside. To allow further extension of the quarry in the dipside in proposed Sasti Expansion OC mine, it is proposed to divert the existing Sasti nala and merge it with Mathra nala in the dip side as shown in the Quarry & surface layout plan.

4) Shifting of Existing Sasti Railway Siding

The quarry of the approved scheme of Sasti OC Extension mine was planned keeping a safe distance from the existing Sasti railway siding which lies in the western part of Sasti block on the coal bearing area. It is proposed in this Mining Plan to extend the quarry floor upto boundary fault F_8-F_8 in the western side to extract coal at low stripping ratio. This will require shifting of existing railway siding in further western side beyond Fault F_8 – F_8 which is also coal bearing area of adjacent Gauri Central block. However, the depth of coal seam beyond fault F_8- F_8 in Gauri Central block is high and this part is not included in the PR of Gauri Central OC mine recently prepared in Gauri Central block. Shifting of Sasti Railway Siding is one of the major surface constraints of the proposed project.

5) Diversion of Existing Road over Embankment & Village Road

The existing road over existing embankment around the Quarry needs to be realigned over the proposed embankment in the western side and in the dip side which includes road connecting Sasti Village to Mathra village. It is proposed to divert this road over the proposed embankment in the dip-side. The embankment top width has been kept as 30m.

6) Re-alignment of HT lines

One 11 kV & One 66 kV HT lines are passing inbetween Sakhari nala and External OB dump no.5 . In this Mining Plan, it is proposed to divert the Gauri Nala and merged into Sakri Nala with the provisioning of widening the Sakhari Nala. As per design of C.D.O. Nashik, the proposed width of Gauri Nala diversion is 75m and width of Sakhari nala widening is around 107.50 m. The existing HT lines are proposed to be re-aligned along the periphery of optimized External OB Dump No.5 to keep a safe distance from proposed diverted Gauri Nala and widened Sakri Nala.

8.1 MINING STRATEGY

The approved PR of Sasti Expansion OC (June 2020) mine envisaged southern dip side expansion as well as western side expansion of existing Sasti OC mine beyond approved PR/Scheme boundary. The proposed quarry floor was proposed to be extended in dip side from approved Scheme limit at 150m depth (40 to 30m FRL) to 200m depth (-20m FRL) at the floor of composite seam. In the western side, the quarry floor was proposed to be extended upto fault F_8-F_8.

The existing Scheme of Sasti OC Extension mine was likely to be exhausted by 31.03.2022. To continue the production from the mine beyond 31.03.2022, the Sasti OC mine should start production as per the approved PR of Sasti Expansion OC (June 2020).

In the approved PR, it was proposed to expand the quarry in dip-side and then start the western patch after shifting of railway siding. However, since the land acquisition as per approved PR is still in progress, the mine/area has started dismantling of existing railway siding and awarded the work (vide letter no. WCL/GM/(CMC)/LOA/34/2021-22/60 dated 01.01.2022) to start mining in western patch within the existing land. Till the commissioning of the new railway siding at Sasti OCM, it was proposed by mine/area to *1)* construct a temporary railway siding within the existing land of Gauri Deep OCM or *2)*

evacuate the coal from Ballarpur railway siding, which can be decided by competent authority of WCL.

The physical possession of land will be acquired in first year i.e. 2022-23 and quarry operation including coal production will also start from 1st year (2022-23) from both Dip-side Patch and Western Patch.

To start the Western Patch, a part of the existing internal BC soil dump & external OB Dump no.-4 need to be re-handled and the existing access trench needs to be re-aligned to touch the coal floor at 140m FRL.

After the diversion of Sasti Nala, Dip-side Patch can also be started and mining operation will continue in both Western Patch as well as Dip-side Patch. It is proposed to continue the production from Dip-side quarry by touching the composite coal seam through the existing access trench to the exposed coal face at 40m FRL and then deepen the mine along dip direction by opening total strike length of the mine. The existing haul road to access the dip side quarry through backfilled area will be utilized initially and thereafter it will be shifted as and when required with advance of quarry in dip side considering the OB backfilling requirement.

The proposed quarriable area of Sasti Expansion OC mine will be worked in two patches i.e. Dip-side patch (proposed target 1.60 Mty) and western patch (proposed target of 0.90 Mty) to achieve enhanced target capacity of 2.50 Mty. These are further sub-divided into a total of four cuts viz. Cut-I in Western Patch and Cut-II, Cut-III and Cut-IV in Dip-side Patch.

Details of these cuts along with quantities of coal, overburden and Stripping Ratio are shown in the table below :

Cut-wise Coal, OB and Stripping Ratio

Sub-Quarry	Cut No.	Depth of Cut (m)	Coal (Mt)	OB (Mm^3)				S.R. (m^3/t)
				BC Soil	Hard OB	Parting OB	Total	
Western Patch	I	50-165	6.52	2.35	29.59	2.53	34.47	5.29

Sub-Quarry	Cut No.	Depth of Cut (m)	Coal (Mt)	OB (Mm^3)				S.R. (m^3/t)
				BC Soil	Hard OB	Parting OB	Total	
Dip-side Patch	II	150-170	4.15	2.59	44.36	0.96	47.91	11.54
	III	170-190	7.45	4.31	74.83	2.23	81.37	10.92
	IV	180-200	6.00	2.38	60.50	1.75	64.63	10.77
Sub-Total			**17.60**	**9.28**	**179.69**	**4.94**	**193.91**	**11.02**
Total			**24.12**	**11.63**	**209.28**	**7.47**	**228.38**	**9.47**

Black Cotton Soil

The top soil in the proposed quarry boundary of Sasti Expansion OC mine consists of Black Cotton soil of about 5 m in thickness. The total volume of black cotton soil required to be removed from the proposed expansion quarry works out to 11.63 Mm^3. In addition to this, about 2.50 Mm^3 BC soil from existing external dump no.4 and 2.40 Mm^3 BC soil from internal dump near Access Trench as well as 1.08 Mm^3 BC soil from inactive dumps near Railway Siding are required to be rehandled. Thus, total BC soil involved in the Sasti Expansion OC mine is 17.61 Mm^3 (11.63 Mm^3 + 2.50 Mm^3 + 2.40 Mm^3 + 1.08 Mm^3). Part of this black cotton soil (12.92 Mm^3) will be dumped initially in Existing BC Soil Dump-B (3.62 Mm^3), Dump-C (2.00 Mm^3), External OB dump no.- 5 (4.36 Mm^3) and in Temporary Top Soil Dump (2.94 Mm^3). Balance 4.69 Mm^3 (17.61 Mm^3 - 12.92 Mm^3) BC soil will be directly carpeted on the top of internal OB dump. The BC soil in Temporary Top Soil Dump (2.94 Mm^3) will also be rehandled on top of the internal OB dump.

Rehandling of OB

To start mining operations in Western Patch, the existing external Dump No.4 (BC Soil dump with plantation) as well as part of existing embankment & part of existing internal Hard OB and BC soil dump need to be rehandled. The existing embankment in the dip-side also needs to be rehandled to allow the further deepening of mine in Dip-side Quarry. The total volume of existing OB quantity required to be rehandled has been assessed as 7.78 Mm^3.

In addition to this, 2.94 Mm^3 BC Soil in Temporary Top Soil Dump will also be rehandled making total rehandling quantity as 10.72 Mm3 (7.78 Mm^3 + 2.94 Mm^3). The break-up of rehandling quantities are shown below:

Year	Rehandling Details		Type of OB	Quantity (Mm^3)
	From	To		
A)	**Rehandling of Existing OB Dumps**			
1st Yr.	Existing Embankment (Dipside)	Proposed Embankment	Hard OB	0.70
1st Yr.	Embankment (Along Railway Siding)	Proposed Embankment	Hard OB	0.30
	Inactive External OB Dump near Rly. Siding	BC Soil Dump-B	BC Soil	1.08
	External OB Dump	BC Soil Dump-B	BC Soil	1.58
	No. 4	BC Soil Dump-B	BC Soil	0.92
1st Yr.	Internal Hard OB Dump	Proposed Embankment	Hard OB	0.80
	Internal BC Soil Dump near Access Trench	BC Soil Dump-B	BC Soil	0.04
		Top of Hard OB Dump No.-5	BC Soil	2.36
	Sub -Total (A)			**7.78**
B)	**Rehandling of Proposed Temp. Top Soil Dump**			
6th Yr.	Temp. Top Soil Dump	Top of Internal Dump	BC Soil	2.94
	Sub -Total (B)			**2.94**
	Total Rehandling			**10.72**

8.2 DUMPING STRATEGY

The total volume of OB from the proposed Sasti Expansion OC mine is 228.38 Mm^3. To start mining operations in Western Patch, the existing External Dump No.4 as well as part of existing embankment & part of existing internal Hard OB & BC soil dump need to be rehandled. The existing embankment in the dip-side needs to be rehandled to allow the further deepening of mine in Dip-side Patch. The total volume of existing OB quantity required to be rehandled has been assessed as 7.78 Mm^3. Thus total OB including rehandling of 7.78 Mm^3 existing OB works out to 236.16 Mm^3 (228.38 Mm^3 + 7.78 Mm^3). In addition to this, 2.94 Mm^3 BC soil dumping initially proposed in Temporary Top Soil Dump will also be rehandled in 6th year on top of the internal dump.

The HFL in the proposed mine area is 178.50 m (year 1959) and therefore, an embankment of hard OB with 30m top width and height of 6m above HFL has been proposed along the periphery of mine wherever required. The quantity of OB for construction of Embankment in proposed Expansion OC mine has been estimated to about 5.50 Mm^3.

One active existing External OB Dump No.5 is in the rise side (eastern side) of the quarry as shown in Quarry & Surface Layout plan. The existing quantity in this dump is 17.18 Mm^3 with dump height of 48 m. It is proposed in this Mining plan to reclaim this dump by carpeting of BC Soil to accommodate additional 4.36 Mm^3 of BC soil OB. The total dump height has been proposed as 60m with two benches of 30 m height each. Hence, total OB in the External OB dump will be 21.54 Mm^3 (17.18 Mm^3 + 4.36 Mm^3). The existing internal dump inside the quarry has accommodated 171.54 Mm^3 of OB . The balance OB quantity that can be accommodated in the internal dump has been estimated as 220.68 Mm^3 as on 01.04.2022. Out of this 220.68 Mm3 OB, 125.30 Mm^3 will be accommodated in the internal void upto ground level and balance 95.38 Mm^3 OB will be accommodated above ground level upto 90 m height. Each layer of dump will be of 30m height with 30m berm between two benches.

In addition to this, at the interval of 90m height (after 3 layers of individual benches), a berm of 60m will be maintained for additional dump stability. Out of 228.38 Mm^3 total OB, the quantity of black cotton soil generated in the proposed quarry is 11.63 Mm^3. In addition to this, out of total 7.78 Mm^3 rehandling of existing OB dump, 5.98 Mm^3 OB is black cotton soil. This black cotton soil will be dumped in existing External BC soil dump as well as spreading on top of internal and external OB dumps.

8.3 DUMP CAPACITY

The different External and Internal dumps proposed in the Mining Plan of Sasti Expansion OC mine and the additional dump capacity as on 01.04.2022 are tabulated below :

DUMP CAPACITY

Sl. No.	OB Dump	Location	Dump Height (m)	Existing Dump Capacity (Mm^3) as on 01.04.2022	Additional Capacity (Mm^3) as on 01.04.2022
1.	**External OB Dump**				
1.1	Dump No.-1,2,3 & 4	Rise Side & Western side of the quarry	30	21.88	-
1.2	Dump No.-5	Eastern Rise Side of the quarry	60	17.26	4.36
1.3	Embankment (5 km)	Around the periphery	6 m above HFL	3.55	5.50
1.4	BC Soil Dump-B	Eastern Rise Side of the quarry adjacent to Dump No.-5	30	2.08	3.62
1.5	BC Soil Dump-C	Northern Rise Side of the quarry and south of Gauri Nala	30	2.08	2.00
	Sub-Total (External Dump)			**46.85**	**15.48**
2.1	Internal Backfilling	Decoaled Void of the Quarry	Below GL	171.54	125.30
			90 m Above GL		95.38
	Sub-Total (Internal Dump)			**171.54**	**220.68**
Total (External + Internal Dump)				**218.39**	**236.16**

From above, it is clear that about 93 % of total additional OB of proposed Sasti Expansion OC mine will be accommodated in Internal dumps and only 7% OB will be dumped in External OB dumps.

8.4 SEQUENCE OF DUMPING OPERATIONS AND STAGE PLANS

The total life of the proposed Mining Plan of Sasti Expansion OC mine is 11 years. The Stage Plan showing status of coal extraction, OB removal, external

and internal dumping and area of excavation in the quarry at the end of 5th year and 11th year (at the end of mine life) are given in the table below :

Sl. No.	Particulars	Qty.
A.	**5th Year Stage Plan**	
1.	Coal Mined (Mt)	11.00
2.	OB Removed (Mm^3)	
	a) In-situ OB from Quarry	109.78
	b) Rehandling of OB	7.78
	Total	**117.56**
3.	Stripping Ratio (m^3/t) (In-situ OB)	9.98
4.	Excavated Quarry Area (ha)	
	Total area	480.00
	Expansion area	135.00
5.	External Dump (Mm^3)	
	a) Temporary Soil Dump	2.94
	b) Existing BC Soil Dump - B	3.62
	c) Existing BC Soil Dump - C	2.00
	d) External OB Dump - 5	4.36
	e) Embankment	5.50
	Total	**18.42**
6.	Internal Dump (Mm^3)	
	a) Below ground	62.30
	b) Above ground	29.06
	Total	**91.36**
B	**11th Year Stage Plan (At the End of Mine Life)**	
1.	Coal Mined (Mt)	24.12
2.	OB Removed (Mm^3)	
	a) In-situ OB from Quarry	228.38
	b) Rehandling of OB	7.78
	Total	**236.16**
3.	Stripping Ratio (m^3/t) (In-situ OB)	9.47
4.	Excavated Quarry Area (ha)	
	a) Total area	544.79
	b) Expansion area	194.85

Sl. No.	Particulars	Qty.
5.	External Dump (Mm^3)	
	a) Temporary Soil Dump (Rehandled)	NIL
	b) Existing BC Soil Dump - B	3.62
	c) Existing BC Soil Dump - C	2.00
	d) External OB Dump - 5	4.36
	e) Embankment	5.50
	Total	**15.48**
	Rehandled Qty. of Temp. Soil Dump	2.94
6.	Internal Dump (Mm^3)	
	a) Below ground	125.30
	b) Above ground	95.38
	Total	**220.68**

8.5 CALENDAR PROGRAMME OF EXCAVATION

The balance coal reserves as per the existing Scheme of Sasti OC Extension mine have almost exhausted by 31.03.2022. To continue the production from the mine beyond 31.03.2022, WCL has awarded the work of mining in Western Patch (within the existing land of Sasti OCM). The process of land acquisition as per the approved PR (June, 2020) is already in progress and is expected to be acquired in 2022-23 (which is considered as 1st year) and after the diversion of Sasti Nala, the Dip-side Patch can also be started and then both the quarries will be in operation to achieve the target of 2.50 Mty in 4th year. In the approved PR of Sasti Expansion OC mine (June 2020), the annual target of coal production was 2.50 Mty which has been considered in this Mining Plan. The total mineable reserves is estimated as 24.12 Mt. Considering the proposed rated output of mine as 2.50 Mty of ROM Coal, the total life of the mine is estimated as 11 years. In this Mining Plan, entire Top OB, coal and parting are proposed to be excavated by outsourcing of HEMM. Shovel dumper combination for coal, parting and top OB are proposed to be excavated by outsourcing of HEMM. The Calendar programme of excavation showing year-wise and cut-wise coal extraction and OB removal as on 01.04.2022 is tabulated below.

CALENDAR PROGRAMME OF EXCAVATION (IN-SITU COAL & OB)

YEAR		CUTS	COAL (Mt)		PROGRAMME OB (Mm^3)			
					BC Soil (Mm^3)	Parting (Mm^3)	Hard OB (Mm^3)	Total OB (Mm^3)
			Ann	Cum.	Ann.	Ann.	Ann.	Ann.
1	2022-23	CUT1	0.90	0.90	1.00	0.35	3.65	5.00
		CUT 2	0.90	0.90	1.00	0.21	10.79	12.00
		Sub-Total	**1.80**	**1.80**	2.00	0.56	14.44	**17.00**
2	2023-24	CUT1	0.90	1.80	1.00	0.35	3.65	5.00
		CUT 2	1.10	2.00	1.00	0.25	10.75	12.00
		Sub-Total	**2.00**	**3.80**	2.00	0.60	14.40	**17.00**
3	2024-25	CUT1	0.90	2.70	0.35	0.35	4.30	5.00
		CUT 2	1.30	3.30	0.35	0.30	14.35	15.00
		SubTotal	**2.20**	**6.00**	0.70	0.65	18.65	**20.00**
4	2025-26	CUT1	1.00	3.70	0.00	0.39	4.61	5.00
		CUT 2	0.85	4.15	0.24	0.20	8.47	8.91
		CUT 3	0.65	0.65	1.00	0.19	8.90	10.09
		SubTotal	**2.50**	**8.50**	1.24	0.78	21.98	**24.00**
5	2026-27	CUT 1	0.90	4.60	0.00	0.35	5.65	6.00
		CUT 3	1.60	2.25	1.00	0.48	16.52	18.00
		SubTotal	**2.50**	**11.00**	1.00	0.83	22.17	**24.00**
6	2027-28	CUT 1	1.00	5.60	0.00	0.39	5.61	6.00
		CUT 3	1.50	3.75	1.00	0.45	16.55	18.00
		SubTotal	**2.50**	**13.50**	1.00	0.84	22.16	**24.00**
7	2028-29	CUT 1	0.92	6.52	0.00	0.36	2.11	2.47
		CUT 3	1.58	5.33	1.00	0.47	20.06	21.53
		CUT-4	0.00	0.00	0.00	0.00	0.00	0.00
		SubTotal	**2.50**	**16.00**	1.00	0.83	22.17	**24.00**
8	2029-30	CUT 3	2.12	7.45	0.31	0.63	12.81	13.75
		CUT 4	0.38	0.38	1.00	0.11	9.14	10.25
		SubTotal	**2.50**	**18.50**	1.31	0.75	21.94	**24.00**
9	2030-31	CUT 4	2.50	2.88	1.00	0.73	22.27	24.00
		SubTotal	**2.50**	**21.00**	1.00	0.73	22.27	**24.00**
10	2031-32	CUT 4	2.50	5.38	0.38	0.73	22.89	24.00
		SubTotal	**2.50**	**23.50**	0.38	0.73	22.89	**24.00**
11	2032-33	CUT 4	0.62	6.00	0.00	0.18	6.20	6.38
		SubTotal	**0.62**	**24.12**	0.00	0.18	6.20	**6.38**
		TOTAL	**24.12**		11.63	7.47	209.28	**228.38**

8.6 DUMPING SCHEDULE

The total volume of OB from the proposed Sasti Expansion OC mine is

228.38 Mm^3. In addition to this, the total volume of OB of existing dump required to be rehandled has been assessed as 7.78 Mm^3. Thus total OB including rehandling of existing dump (7.78 Mm^3) works out to 236.16 Mm^3 (228.38 Mm^3 + 7.78 Mm^3). Moreover, 2.94 Mm^3 BC soil dumping initially proposed in Temporary Top Soil Dump will also be rehandled in 6th year and will be dumped on top of the internal dump.The year wise dumping schedule for proposed Mining plan of Sasti Expansion OCM is tabulated below:

YEAR-WISE DUMPING SCHEDULE

Year	Type of OB	Volume of OB (Mm3)	External Dump					Internal Dump	
			BC Soil Dump-B	BC Soil Dump-C	Temp Soil Dump	Embank-ment	OB Dump No. - 5	Below Ground	Above Ground
1	BC Soil	2.00		2.00					
	Hard OB	15.00				1.50		13.50	
	RH	7.78	3.62			1.80	2.36		
	Sub-Total	**24.78**	**3.62**	**2.00**	**0.00**	**3.30**	**2.36**	**13.50**	**0.00**
2	BC Soil	2.00					2.00		
	Hard OB	15.00				2.20		12.80	
	Sub-Total	**17.00**	**0.00**	**0.00**	**0.00**	**2.20**	**2.00**	**12.80**	**0.00**
3	BC Soil	0.70			0.70				
	Hard OB	19.30						10.00	9.30
	Sub-Total	**20.00**	**0.00**	**0.00**	**0.70**	**0.00**	**0.00**	**10.00**	**9.30**
4	BC Soil	1.24			1.24				
	Hard OB	22.76						13.00	9.76
	Sub-Total	**24.00**	**0.00**	**0.00**	**1.24**	**0.00**	**0.00**	**13.00**	**9.76**
5	BC Soil	1.00			1.00				
	Hard OB	23.00						13.00	10.00
	Sub-Total	**24.00**	**0.00**	**0.00**	**1.00**	**0.00**	**0.00**	**13.00**	**10.00**
6	BC Soil	1.00							1.00
	Hard OB	23.00						13.00	10.00
	RH				-2.94				2.94
	Sub-Total	**24.00**	**0.00**	**0.00**	**-2.94**	**0.00**	**0.00**	**13.00**	**13.94**

Year	Type of OB	Volume of OB (Mm3)	External Dump					Internal Dump	
			BC Soil Dump-B	BC Soil Dump-C	Temp Soil Dump	Embank-ment	OB Dump No. - 5	Below Ground	Above Ground
7	BC Soil	1.00							1.00
	Hard OB	23.00						12.00	11.00
	Sub-Total	**24.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**12.00**	**12.00**
8	BC Soil	1.31							1.31
	Hard OB	22.69						12.00	10.69
	Sub-Total	**24.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**12.00**	**12.00**
9	BC Soil	1.00							1.00
	Hard OB	23.00						11.00	12.00
	Sub-Total	**24.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**11.00**	**13.00**
10	BC Soil	0.38							0.38
	Hard OB	23.62						10.00	13.62
	Sub-Total	**24.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.00**	**14.00**
11	BC Soil	0							
	Hard OB	6.38						5.00	1.38
	Sub-Total	**6.38**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**5.00**	**1.38**
	Total	**236.16**	**3.62**	**2.00**	**0.00**	**5.50**	**4.36**	**125.30**	**95.38**

From above table, it is clear that **93 %** of total OB of proposed Sasti Expansion OC mine will be accommodated in Internal dump of adjacent mine and and only 7 % OB will be dumped in External OB dumps.

8.7 EQUIPMENT SCHEDULE

The PR for Sasti Expansion OCM (2.50Mty) prepared in June 2020 was approved in Total Hiring Option considering Departmental Dragline. However, as decided by WCL Dragline is to be surveyed off hence this Mining plan proposes coal extraction, parting and top OB removal by outsourcing of HEMM. Hence, no departmental HEMM has been proposed for coal extaction and OB removal. Only common HEMM is provided in Total Hiring Option.

The list of HEMM proposed in this Mining Plan for Total Hiring Option is as follows:

Sl. No.	Existing HEMM (As on 01.04.2022)		Total Hiring Option			Phasing					
	Particulars	Nos.	Particulars	New/ Repl.	No.	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	Yr-6
A)	**TOP OB**										
1	20/90 Dragline	1	-	Proposed to be surveyed-off							
2	EKG 5m^3 Rope Shovel	1	-	By Hiring / Out-Sourcing of HEMM Existing HEMM will not be Replaced							
3	BE 1000 5m^3 Diesel Hyd Shovel	4									
4	60T RD Dumpers	16									
5	160mm dia drill	2									
6	250mm dia Elec. drill	2									
7	320 HP Dozer	4									
B)	**COAL & PARTING**										
1	4.3 m^3 Diesel Hydraulic Shovel	1	-	By Hiring / Out-Sourcing of HEMM Existing HEMM will not be Replaced (Coal will be extracted by outsourced Surface Miner)							
2	60T RD Dumpers	12									
3	160mm dia drill	1									
4	320 HP Dozer	3									
C	**COMMON HEMM**										
1	8t Crane	3	8t Crane	Repl.	**3**					2	1
2	50t Crane	2	-	By Hiring / Out-Sourcing of HEMM Existing HEMM will not be Replaced							
3	Water Sprinkler	4	28kl Water Sprinkler with Mist spray	Repl.	**4**	2					2

Sl. No.	Existing HEMM (As on 01.04.2022)		Total Hiring Option			Phasing					
	Particulars	Nos.	Particulars	New/ Repl.	No.	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	Yr-6
C)	**COMMON HEMM**										
4	280 HP Motor Grader	2	280 HP Motor Grader	Repl.	**2**	1					1
5	Tyre Handler	1	-	By Hiring / Out-Sourcing of HEMM Existing HEMM will not be Replaced							
6	1.57 m^3 Diesel Hyd Backhoe	1	1.5 m^3 Diesel Hyd Backhoe	Repl.	**1**					1	
7	460 HP Wheel Dozer	1	460 HP Wheel Dozer	Repl.	**1**						1
8	Road Sweeping M/c	Nil	Road Sweeping M/c	New	**1**	1					
9	Vibratory Compactor	Nil	Vibratory Compactor	New	**1**		1				

8.8 DRILLING & BLASTING

The degree of fragmentation in opencast mine has to be optimized so that total cost of drilling, blasting, excavating, transport and crushing as a total system is minimised. In order to keep the ground vibrations within the permissible limit as per DGMS Circular No. 7 of 1997, to avoid flying of rock fragments and also to achieve satisfactory blasting results, optimized drilling / blasting parameters depending upon rock formation using combination of relays / delays will have to be evolved. It is further recommended that at the time of actual execution, proper study for controlled blasting and ground vibration is to be done with the help of scientific body in order to evolve site specific charge distance relationship.

It is proposed that Site Mixed explosive should be used to save charging time and avoid storage problems of explosive. Powder factor of 3.00 m^3/kg for OB has been considered in this mining plan for planning purpose. However, during actual operation, powder factor may vary depending on the nature of actual strata and hence it is to be determined based on field study. Coal cutting is proposed to be done by Surface Miner.

9.1 QUALITY

The quality of coal in combined Sasti and Mathra block has been assessed on I100 basis and the summarised Quality is given below :

Coal seam / Parting	Thickness Range(m)		Average Thickness (m)	Average GCV kCal/kg
	Minimum	Maximum		
Composite Top Section	0.83 (MWS172)	3.18 (MWS004)	1.90	4789 (G9)
Parting	1.26	3.45	2.26	
Composite Middle Section	3.8 (MWS156)	10.33 (MWS077)	6.69	5158 (G8)
Parting	2.56	4.73	2.76	
Composite Bottom section	1.71 (MWS138)	5.54 (MWS142)	4.17	5099 (G8)

The declared grade of coal in existing Sasti OC Mine for 2021-22 (coal extracted done by shovel dumper combination) is tabulated below :

Mine/ Siding	Declared Grade for Year 2021-22			
	Seam / Siding	Steam	Slack	ROM/CR. ROM
Sasti OC Mine	Ballarpur Composite	G-8	G-10	G-11
New Sasti Siding		-	-	G-11

From above tables it is clear that the coal being despatched from the existing Sasti Expansion OC mine is G-11 ROM coal whereas the quality of individual coal seam sections on I100 basis varies from G-8 to G-9 GCV band.

This may be due to dilution of coal due to mixing of other in-seam bands as well as parting between different sections during mining operation. Moreover, there is always some dilution of coal occurring at the contact point of coal seam and Top OB/Parting.

Continuing the shovel-dumper combination for Coal excavation, the Coal quality considered in the Approved PR of Sasti Expansion OCM (2.50 Mty), June 2020 with dilution due to mixing of other in-seam bands as well as parting worked out to be **G-11 (4270 kCal/kg)** as tabulated below:-

Approved PR of Sasti Expansion OCM (2.50 Mty), June 2020				
Seam Sections	Average Thickness (m)	Seam Section wise GCV (kCal/kg) on I100 basis without Dilution	Overall GCV on I100 basis Without Dilution	Overall GCV with Dilution due to mixing of parting and other in-seam band
Top Section	1.90	4789	5023	4270 **(G-11)**
Middle Section	6.69	5158		
Bottom Section	4.17	5099		

To minimize the dilution, it is proposed in this Mining Plan to deploy Surface Miner for coal cutting which will improve the coal quality.

Considering all the above factors, Coal quality Without dilution and with 0.10m dilution at the roof and floor of all sections of composite seam are tabulated below:-

Undiluted					
SEAM	M%	A%	GCV kCal/kg	GRADE	WT.AVG kCal/kg
TS	6.6	30.1	4793	G9	5126 (G8)
MS	7.4	23.6	5219	G7	
BS	7.7	24.3	5156	G8	

0.10 m dilution at Roof & Floor (Proposed in Mining Plan)					
SEAM	M%	A%	GCV kCal/kg	GRADE	WT.AVG kCal/kg
TS	6.1	35.2	4446	G10	**4850 (G9)**
MS	7.1	26.5	4998	G8	
BS	7.2	28.3	4871	G9	

In the proposed Mining Plan, 0.10 m dilution at contact points has been considered. Thus, the overall quality of coal considering 0.10 m dilution at roof and floor of all sections of composite seam in the proposed Sasti Expansion OC works out to **G-9 (4850 kCal/kg)** which has been proposed in this Mining Plan by deployment of Surface Miner. However, efforts should be made to minimize dilution of coal while coal extraction by Surface Miner.

10.1 PUMPING & DRAINAGE

The Pumping requirement in this mining plan are proposed as per the approved PR of Sasti Expansion OC mine (June 2020).

The proposed project is located in Ballarpur Area of WCL. In absence of sufficient hydro-geological data and actual make of water of the mine, ground seepage is assumed 15% of maximum rainfall water accumulated in a day. Pumping provision made in this Mining Plan is sufficient to sustain the production for target plus five years.

The Pumping capacity required at the time of five years after reaching the target has been calculated as under:-

Sl. No.	Particulars	Qty.
1	Max. Exposed Area (m^2)	5,000,000
2	Surface Area of Mine considered for excavation (m^2)	2,400,000
3	Area beyond excavation (5% of item No.2) (m^2)	120,000
4	Backfilled Area (m^2)	2,600,000
5	Run-off co-efficient for:-	
	(a) Open excavation	0.7
	(b) Beyond excavation	0.1
	(c) Infiltration Co-efficient for Backfilled area	0.2
6	Probable Max. rainfall in a day (mm)	180
7	Water collected into the quarry by direct rainfall (m^3)	7
8	Required pumping capacity to handle the whole rain water in 100 hrs. (lps)	8

Sl. No.	Particulars	Qty.
9	Required pumping capacity to handle the seepage water in 18 hrs. (lps)	246
10	Total pumping capacity required to handle the whole water of the mine. (lps)	1475
11	Depth of Mine (m), target plus five years	180

Pumping system has been designed for the volume of water accumulated in the mine at the target plus five year production considering maximum rainfall in a day as **180mm**

Peak pumping capacity worked out as **457884 cum.**

Above volume of water will be dewatered in **5** days at the rate of 18 hrs pumping per day.

Pumping capacity per day thus worked out as **91577cum or 1475 lps.**

Installed Pumping capacity per day is **116640 cum or 1800 lps**

Existing Pumps

(i) There is two nos of existing pump of 200 lps x 150m head, will be utilized as auxiliary pumps.

(ii) There is four nos of existing pump of 150 lps x 200m head, will be utilized as auxiliary pumps

(iii) There is two nos of existing pump of 80 lps x 150m head, will be utilized as auxiliary pumps

(iv) There is one no of existing pump of 76 lps x 150m head, will be utilized as auxiliary pumps

(v) There are existing ten delivery ranges of 200 mm dia. Will be utilized for existing auxiliary pumps of different discharge and different head. Maximum one pump will be connected in each delivery.

These existing pumps and pipes will be utilized in the beginning of the mine. After five to six years, mine will be operating in higher depth and for that new

pumps have been provided which will be procured as per requirement proposed in Approved PR of Sasti OCM,2.50 Mty (June 2020).

Additional Pumps

(vi) Ten main pumps of 225 lps x 250m head have been proposed. Out of ten pumps, two pumps are standby.

(vii) Three pumps of 150 lps x 100m head have been proposed for auxiliary pumping.

(viii) One diesel pump of 80 lps x 60m head has been proposed.

(ix) Five face pumps of 11 lps x 30 m head have been envisaged in this report and out of five pumps, one is standby.

(x) Eight delivery ranges of 324 mm dia. have been proposed for main pumps of 225 lps x 250m head and maximum one pump will be connected in this delivery.

(xi) Three delivery range of 324mm dia. has been proposed for auxiliary pumps of 150 lps x 100m head and maximum one pump will be connected in each delivery.

(xii) One delivery ranges of 219mm dia. have been proposed for Diesel pump of 80lps x 60m separately.

(xiii) 80 mm dia. G.I. pipe will be used for face pumps.

(xiv) No piping provision have been made for standby pumps.

11.1 COAL HANDLING PLANT & DESPATCH ARRANGEMENTS

This Mining Plan for Sasti Opencast Mine has been planned for a rated production capacity of 2.50 Mty of (-)100 mm ROM coal mined by Surface Miner.

At present two streams of CHPs are existing at Sasti OC mine. First stream has facilities of crushing of ROM coal upto (-)100mm size by feeder breaker and double roll secondary crusher of 400 tph capacity each, elevating belt conveyor, overhead hoppers for storage and truck loading, truck loading

arrangements, weighing arrangements, dust suppression arrangements, fire fighting arrangements, electricals etc. Second stream has facilities of crushing of ROM coal upto (-)100mm size by feeder breaker and double roll secondary crusher of 400tph capacity each, elevating belt conveyor discharging coal on ground, truck loading by pay loaders/Front end loader, weighing arrangements, dust suppression arrangements, fire fighting arrangements, electricals etc. Both existing streams will be utilized to crush coal for other nearby mines as coal cutting has been proposed by surface miner in this mining plan.

It was proposed in the approved PR (June 2020) to shift the existing Railway Siding (within the acquired land) to further western side to extract the coal upto fault F_8 – F_8 located beneath the Railway Siding. The shifting of railway track is in progress, and meanwhile it is proposed in this mining plan to evacuate coal via Temporary Warfwall Siding at Gauri deep / Panderpauni siding / Ballarpur siding. New railway siding will be constructed in further western side of the proposed quarry beyond fault F_8-F_8. The proposed site lies in adjacent Gauri Central block which is coal bearing area (depth around 175m) but not included in the PR of Gauri Central OCM. Hence, it was proposed in the Approved PR of Sasti Expansion OCM (2.50 Mty), June 2020 to construct Railway Siding adjacent to Sasti Expn. OC mine in western side within the existing land of Sasti OCM. This same arrangement for coal evacuation has been proposed in this mining plan.

About 2.5 km of new railway track will be required to lay upto new siding from main line. Two numbers of railway tracks will be provided near new warf wall siding. Necessary linkage between two tracks has been provided. One track will be loading track and another track will be utilized for yard/engine changing track. Coal from Surface miner from Western patch & Dip-side patch will be loaded into trucks and transported to the nearby railway siding shifted in further west side. Trucks will dump coal on the elevated platform to create stock along the railway siding. Coal from the stock will be loaded into railway wagons with the help of pay loaders/front end loaders. One number of warf wall of 1.26m height and 800m long will be constructed along each platform.

Two numbers of electronic road weighbridge for weighing of trucks at siding is existing. Two numbers of electronic in-motion rail weighbridge of 100 T capacity suitable for broad gauge line will be provided to weigh empty and loaded rakes. These weigh bridges will also have print out facility.

In the event of spontaneous heating of coal resulting fire in coal heap, proper fire fighting arrangement will be provided to combat fire in case of emergency. Dust suppression arrangement will be provided for suppression of dust by spraying water in atomized condition with the help of pipes and nozzles as and when required.

A borehole will be provided with a submersible pump for supplying the required quantity of water needed for dust suppression and fire fighting. An underground water tank of 50000litre capacity and an overhead water tank of 10000litre capacity will be provided for storage and supply of water for drinking, fire fighting and dust suppression.

12.1 WORKSHOP

This Mining plan is prepared without considering the Dragline deployment and its supportive HEMM like Dozer and Drill, entire HEMM deployed in this mine will be hired and their maintenance will be contractor's responsibilities. Hence, there is no provision of any unit excavation workshop in the report. E & M workshop facilities have been provided to carry out the maintenance and repair of the CHP equipment, pumps, electrical etc. of the mine. This E & M workshop will be supported by Regional/Central workshop for major repairs and parts manufacture, because it is essentially a pithead maintenance workshop.

Maintenance and repairs of CHP equipments, pumps, dozer, drill, electrical, manufacture of spares to a limited extent, transformer oil filtration, scheduling for repair needs at Regional/Central workshop etc. have been provided in the scope of activities of the workshop. Facilities provided in this workshop are machine shop, mechanical repair shop, electrical repair shop, welding and structural section, etc. Necessary provision for plant and machinery, tools,

testing equipment etc. has been provided in respective shops for efficient repair and maintenance of the mine equipments.

One small and independent unit stores has been provided at convenient location to cater the routine needs of consumables, spares, POLs etc. This will depend on Regional/Central stores for major spares.

13.1 POWER SUPPLY

Sasti Expansion OC Mine is situated in the Ballarpur Area of WCL. This mine is planned for a production of 2.50 Mty. The coal production in Western patch & Dip-side Patch is proposed to be done by deployment of Surface Miner on hiring basis. Entire OB is proposed to be removed by Shovel - Dumper combination on hiring basis .

The projected maximum demand of the mine excluding loads of Dragline and colony as per Approved PR of Sasti OCM , 2.50Mty (June 2020) was 6349 kVA for Total Hiring option .

At present entire load of Ballarpur Area is being catered by a 66 kV/11 kV Sasti central substation. The present contract demand of this central substation is 9000 kVA. The existing installed capacity of Sasti central substation is 2 X 10/12.5 MVA, 66 kV/11kV.

At present, MSETCL is in process of eliminating 66 kV transmission system. MSETCL is either dismantling the 66 kV system or converting it in to 33 kV or 220 kV system. Further, MSETCL is not allowing any change in contract demand of existing 66 kV system. So, it is not possible to put any additional load on the existing 66 kV/11 kV central substation. Considering this, a new 33kV/6.6 kV substation is proposed for Sasti Expansion OC mine.

The existing 66kV central substation is the only source of power for the mines of Ballarpur Area and the substation is more than 25 years old and has outlived its useful life.

As mentioned above, MSETCL has already discarded the 66 kV transmission system for supplying power to any consumer. It is better and

reliable to have a centralized source of power for entire Ballarpur area. Keeping in view of this, it is proposed to have a central substation of 220 kV voltage level.

A substation having capacity 2 X 30MVA/35MVA, 220kV/33 kV will be installed at a suitable location in Ballarpur Area. This substation will feed power to the existing and upcoming mines of Ballarpur Area.

It is proposed to draw two no's of 33 kV, 2 km (approx.) long overhead line from proposed 220 kV/33 kV central substation to a suitable location of proposed Sasti expansion OC mine. For catering the power requirement of proposed mine, One number of 33 kV/6.6 kV substation is proposed to be installed at suitable location on non-coal bearing area.

If conversion of Sasti Central Substation from 66kV to 33kV gets materialized, then the incoming power supply system may be reviewed. The followings extension / diversion of HT Lines was proposed in the Approved PR of Sasti OCM , 2.50Mty (June 2020) as these lines are falling within the mine boundary.

Sl. No.	Particulars	Quantity
1	220 kV, double feeder line from nearest available location (Ballarpur Paper Mill Feeder) to a suitable location near proposed OC Mine, where a 220kV/33kV Central Substation is proposed to be installed.	20 km (Approx.)
2	Installation of 2 x 30(ONAN)/35(ONAF) MVA, 220 kV/ 33 kV Substation on Turnkey basis.	
3	Two Numbers of 33 kV, Overhead Line from proposed 220kV central substation to a suitable location near proposed OC mine. Approximate length for OHL is 2 kM (for each feeder)	4 km (Approx)
4	Realignment of 11 kV Overhead line passing over External dumping area	2.50 km (Approx)
5	Diversion of 66 kV Overhead line passing over External dumping area	2.25 km (Approx)

Connected Load, Maximum Demand

The details of connected load and Maximum Demand as per the Approved PR of Sasti OCM , 2.50Mty (June 2020) and its colony are given below:-

Sl. No.	Item Head	Total Hiring Option
1.	**CONNECTED LOAD**	
	a) Only Mine	14517 kW
	b) Only Colony	671 kW
	c) Total	15188 kW
2.	**LOAD IN OPERATION**	
	a) Only Mine	12708 kW
	b) Only township	569 kW
	c) Total	13277 kW
3.	**PROJECTED MAXIMUM DEMAND**	
	a) Only Mine	7399 kVA
	b) Only township	435 kVA
	c) Total	7834 kVA

14.1 CIVIL CONSTRUCTION

The civil infrastructure in this mining plan are proposed as per the Total Hiring Option of approved PR of Sasti Expansion OC mine (June 2020).

14.1.1 Life of the project & specifications

The estimated life of proposed Sasti Expansion OCM is about 11 years. Considering the future expansion of mine and availability of coal reserves, as such all civil works have been envisaged on permanent specifications.

14.2 SERVICE BUILDINGS

Keeping in view the needs and requirements of this mine, provision for service buildings such as, Project office, E & M Workshop, Unit Stores, Sub-stations, Magazine and other service buildings have been provided.

14.3 RESIDENTIAL BUILDING

14.3.1 Manpower & No. of Quarters

Total manpower proposed as per the approved PR of Sasti Expansion OC mine (June 2020) is 358 in Total Hiring option. The existing quarters as per the data given by Mine/Area are : 652 Nos. “Miners quarters”, 166 Nos. ‘B’ type, 64 Nos. ‘C’ type, and 4 No ‘D’ type . Considering the manpower req. and no. of existing quarters, no additional quarters have been provided.

14.4 ROADS AND CULVERTS

14.4.1 Colony Roads & Culverts

As no provision of new residential buildings are envisaged for the proposed manpower of the mine, accordingly no new provision of colony roads and culverts are envisaged.

14.4.2 Haul Roads & Culverts

For transportation of Coal, Haul Road of 3.5 km length inside mine with necessary culverts and drain has been envisaged as per proposed mine plan is considered as additional provision.

14.4.3 Heavy Duty Roads & Culverts

For transportation of overburden, Heavy Duty Road of 1.00 km length on surface of mine with necessary culverts and drain has been envisaged as per proposed mine plan as additional provision.

14.4.4 Service Roads & Culverts

For approaching different Service Buildings 2.0 km length long Sector Road on Stratum `C’ specification with necessary culverts, and tree guards etc. has been envisaged as per proposed mine plan as additional provision.

14.4.5 Diversion Roads & Culverts

Diversion of road of 1.50 km length long Sector Road on Stratum `C' specification with necessary culverts, drains and tree guards etc. has been envisaged as per proposed mine plan is considered as additional provision.

14.5 WATER SUPPLY ARRANGEMENT

Water supply arrangement has been envisaged for project only and water requirement is given below.

Colony Water Demand

No additional quarter has been proposed in this Mining Plan as the existing quarters will meet the requirement for the mine . Hence, the colony water demand will be met by existing system.

Industrial Water Demand

Water demand for project site includes water to be supplied for dust suppression, firefighting, water sprinkling on roads, etc. The water demand has been estimated considering the water requirement of out-sourcing agency also.

The total water requirement for project site has been worked out to 620 Kl and the detailed calculation is tabulated below :

Industrial Water Demand for Project including Potable Water demand for Persons working in the Project			
Sl. No.	**Particulars**	**Units**	**Qty**
	Capacity:	Mty	2.50
	No. of Dumpers	No.	75
	No. of Dozers	No.	15
a)	Water requirement for total manpower of Project @ 45 litre/capita/day	lpd	50130

Sl. No.	Particulars	Units	Qty
b)	Water requirement for washing of dumpers @ 1800 litre/ dumper/day	lpd	162000
c)	Water requirement for dust suppression in CHP & other industrial premises @22500 litre/ day/million tonne of coal production per year	lpd	56250
d)	Water requirement for fire fighting @45000 litre/ day/million tonne of coal production per year	lpd	112500
e)	Water requirement for road watering @ 67500 litre/ day/million tonne of coal production per year	lpd	168750
f)	Water requirement of Service Buildings @ 10% of item (a) of above	lpd	5010
g)	Allowance for loss & wastage @ 10% (a) to(f)	lpd	55500
	Total Water Demand	lpd	610140
	Say	lpd	620000
		Kl	**620**
	Hourly requirement for 16 hrs pumping	lph	38750
		lps	10.77
	Say	**lps**	**11**

14.5 SEWAGE DISPOSAL ARRANGEMENT

To avoid any discharge of effluent into natural watercourses, sewage disposal arrangement has been envisaged only for industrial purpose.

14.6 NALLAH DIVERSIONS

As per the proposed mining plan, Sasti nallah flowing in the mine boundary needs to be diverted. For preparation of a suitable flood protection scheme, information on topography, characteristics and hydrology of the stream, history of past floods and works are necessary. Due to unavailability of basic data of the stream, a cross section of the Sasti nallah is assumed with Bottom width-20m, and height-5m and 2.0 km length of the nallah has been considered as per proposed mine plan.

For Gauri nallah diversion and Sakhri Nallah widening, the cross section of nallah is considered as per design given by CDO Nashik. The diverted length of Gauri nallah is 1.55km and the bottom width and depth is taken as 75.5 m and 3.6m respectively. The widening length of Sakhri nallah is 1.50 km & the bottom width & depth is taken as 107.5 m and 3.6m respectively.

However, proper detailed design carrying all engineering studies and requirement for nallah diversion may be done by appropriate authority.

14.7 CULVERT OVER GAURI NALA

Four number of culverts of 3.05 m span and 17.5m length have been envisaged in this Mining plan. However, proper detailed design carrying all engineering studies and requirement for culverts to cross the nala may be done by appropriate authority.

14.8 CONSTRUCTION OF BRIDGE

Two nos. of bridges over Sasti nala have been envisaged in this Mining plan, one (20m length) for crossing of village road to Mathra Village over proposed diverted Sasti nala and another (30m length) for crossing of proposed railway line over existing sasti nala . However, proper detailed design carrying all engineering studies may be done by appropriate authority.

15.1 SAFETY AND CONSERVATION

The project report has been drawn in conformity with the prevailing statutory provisions as per Mines Act 1952 and CMR 2017 applicable for safety in Opencast Mines. However, all statutory rules, regulations, applicable laws etc. and statutory requirement related to Govt. licenses, workers compensation, Insurance, etc. including minimum wage act/CIL High Power Committee wages for workers employed by the agency outsourcing HEMM shall have to be adhered to. All the regulations & schedules of coal mines Regulations 2017 relating to opencast mining have to be adhered to and implemented in order to maintain day to day safety precautions as per statute.

15.1 INUNDATION

Sasti Nala is flowing over the proposed expansion area of the project and it is proposed in this Mining Plan to divert the existing Sasti nala and merge it into Mathra nala in the dip side. Moreover, the Gauri nallah is also proposed to be diverted alongwith widening of Sakhri Nallah as per design given by CDO Nashik and is shown in the Quarry & surface layout plan. The main drainage of the area is controlled by the Wardha River, which is flowing southerly and is located about 2 km north from the area. The Gauri nala controls the local drainage system. The Sasti and Mathra nalla join together in the north eastern area outside of the block. The nalla in the further east of the confluence of Sasti and Mathra nalla is called Dhupthala nalla. The H.F.L. of the Wardha River as recorded by Sasti Colliery in year 1959 is 178.5m.

An embankment of 30m width and 6m height above HFL has been proposed all along the periphery of the mine for safety against surface water inundation. As per prevailing practice, proposed embankment has to be constructed by spreading the suitable soil i.e fine grained soil for Hearting zone and coarse grained soil for casing zone in continuous layers and compacted by mechanical means i.e. by rollers to standard optimum dry density at optimum moisture content. However before adoption of this section, it is suggested that the proposed embankment section may be got approved by competent authority like Maharashtra Irrigation department of Govt. of Maharashtra and DGMS for its structural safety and stability. The alignment of the proposed embankment is shown in Quarry & Surface Layout Plan. It is also suggested to determine withdrawal level/Danger mark, so that as water level crosses the limit, workings shall be stopped.

Suitable float alarms connected to Wardha river would be provided at strategic places like Time Keeper Office, Security Office, Safety Office, Manager Residence, Pit Office etc. The floats in the river would activate the alarms as soon as the water level in the river crosses the danger mark. Suitable action can then be taken to investigate the alarm and take other suitable precautions. In addition, river side patrolling would also be carried out during monsoon to caution the project authority in case of any

sudden rise of water level in the river. Adequate wireless communication sets have been provided for the above purpose. The rain water falling within the project area would be diverted from the quarry area by providing garland drains and shall be collected towards low lying area.

15.2 DUST SUPPRESSION

For suppression of dust, water sprinkler with mist spray has been provided in this Mining Plan. Suppression of mine dust may be done by using package bond & dust bond, for methodology of application relevant DGMS Circular may be strictly adhered to.

15.3 GENERAL LIGHTING

The standards of lighting to be provided in opencast coal mines during working at different places or areas where natural light is not sufficient has been specified in CMR, 2017. They have to be strictly adhered to for efficient and safe working. Illumination of quarry general area/dump area will be by 300 W, LED lamps fitted in flood light luminaries. A cluster of six lamps mounted on 15 m high lighting towers will be provided. Sufficient nos. of such towers has been provided. The illumination of haul road is permanent in nature and will be illuminated by 250 W LED lamps fitted in street light fittings. These fittings will be mounted on 12.0 m high poles installed along the length of haul road either on one side or on two sides depending on the width of haul road. The production faces will be illuminated by 300 W LED lamps fitted in symmetrical flood light fittings and mounted on 5.5 m high towers (self supporting) or may be mounted on HEMM itself.

Sufficient no's of mobile lighting tower is also provided for illumination of general quarry area and production faces. These mobile lighting tower will be movable type and can be shifted as per requirement.

15.4 FIRE AND SPONTANEOUS HEATING

Following safety precautions should be followed to avoid fire and spontaneous heating in the mine :

i) Wild or herbaceous plants shall be removed from the mine.

ii) No person shall deposit heated material or ashes on any opencast working. Also no person shall light a fire or permit a fire to be lighted in any OC working except by the permission in writing of the Manager and only for a special purpose specified therein.

iii) No coal shall be left exposed in coal benches more than its incubation period to avoid fire due to spontaneous heating.

iv) Proper type of the extinguisher should be kept in each HEMM ready for use in case of emergency.

v) In coal stock, coal shall be dispatched on the basis of first in first out.

15.5 SLOPE STABILITY

It is suggested that following actions may be taken to deal with slope stability problem.

i) Vulnerable area may be identified and marked on quarry plan.

ii) Observation of actual alignment of fault, its throw, joints, etc. may be recorded during the process of exploitation.

iii) Water drainage system may be properly implemented to prevent accumulation of water in cracks. Also dumps shall be levelled to prevent accumulation of water over it. Proper drainage in dumps shall be also provided to prevent erosion of toe of dump.

iv) Regular monitoring of tension cracks, horizontal and vertical movement of strata in critical area may be done.

v) Rise side slope to be reinforced if required because it has to stand throughout quarry life. No dumps/surface structures to be located within 15m of quarry edge as it will act as surcharge there by destabilizing the slope.

vi) No undercutting of slopes to be done.

vii) Proper hydro-geological studies should be done and if water table is at level of slope it should be brought down by using submersible pumps to prevent hydrostatic pressure.

viii) Proper selection of site for dumping to be done. Before dumping, place of dumping should be made free from loose material. Dumping shall not be done at an angle more than angle of repose of material being dumped.

ix) After completion of dumping operations, dumps should be stabilized by growing vegetation.

x) Every person deployed by leaser of HEMM must be trained & briefed about aspects related to slope stability.

xi) Slope stability studies should be done before dumping OB in to the voids filled with water.

xii) No hard OB should dumped above black cotton soil dump.

15.5.1 STABILITY OF DUMPS

Coal Mines Regulation, 2017 provides for precautions to be taken for Spoil banks and dumps in Regulation no. 108 and Circular No. DGMS (Tech.) (S&T) Circular 2 Dhanbad, dated 20/6/2001. The Regulation is as following:

Spoil banks and dumps (Regulation 108)

(1) While removing overburden, the top soil shall be stacked at a separate place, so that the same is used to cover the reclaimed area.

(2) Slope of a spoil bank shall be determined by the natural angle of repose of the material being deposited, but shall in no case exceed 37.5 degrees from the horizontal.The spoil bank shall not be retained by artificial means at an angle in excess of natural angle of repose or 37.5 degrees whichever is less.

(3) Loose overburden and other such material from opencast workings or other rejects from washeries or from other source shall be dumped in such a manner that there is no possibility of dumped material sliding.

(4) Any spoil bank exceeding 30m in height shall be benched so that no bench exceeds 30 m in height and the overall slope shall not exceed 1 vertical to 1.5 horizontal.

(5) The toe of a spoil-bank shall not be extended to any point within 45 m of a mine opening, railway or other public works, public road or building or other permanent structure not belonging to the owner.

(6) A suitable fence shall be erected between any railway or public works or road or building or structure not belonging to the owner and the toe of an active spoil bank so as to prevent unauthorized persons from approaching the spoil-bank.

(7) No person shall approach or shall be permitted to approach the toe of an active spoil bank where he may be endangered from material sliding or rolling down the face.

(8) Adequate precautions shall be taken to prevent failure of the slopes of the spoil banks or dumps.

15.6 HAUL ROAD MAINTENANCE

Adequate care must be taken for proper construction and maintenance of haul road as per the existing guidelines. The gradient of haul road should not be steeper than 1 in 16.

15.7 GENERAL LIGHTING

The standards of lighting to be provided in opencast coal mines during working at different places or areas where natural light is not sufficient has to be provided as per latest provision in CMR 2017. They have to be strictly adhered to for efficient and safe working.

15.8 BLASTING

At the time of operation of mine, drilling parameters have to be optimized on the basis of actual field trial depending upon joint pattern, bedding plane, type of rock and local geology of the blast site. Suitable precautions would be taken as per statute before and after blasting operations. While working near infrastructure, buildings etc., controlled blasting technique has to be practiced to minimize fly-off rocks and ground vibrations and to keep them within safe limits. Provision for scientific studies was made in approved PR(June 2020).

15.9 CONSERVATION OF COAL

Although for calculation of mineable coal reserves, 5 % mining losses has been taken into account, but in practice all efforts would be made to minimise the losses. All efforts shall be made to reduce carpet loss on floor of quarry, loss of coal in each contact zones and to reduce pilferage of coal while transporting it from coal face to coal stockyard/CHP. OB benches would be kept sufficiently advanced to avoid mixing of coal & OB.

15.10 SCIENTIFIC STUDIES

Following areas have been identified in the Mining Plan of Sasti Expansion OC mine for detailed scientific studies:

a) Slope Stability

It is proposed to carry out scientific study on slope stability of external and internal OB dumps as well as for final slope of quarry batter. Based on the findings of scientific research the proposed slope of dumps and batter may change.

b) Drilling & Blasting

For optimum fragmentation of rock to minimize the overall cost of excavation, it is proposed in this report to engage some scientific body to carry out research for optimum drilling and blasting. Accordingly, the powder factor suggested after this study will be followed in the proposed mine.

c) Hydrogeology

Proper provision has been made in this report for scientific study to assess the hydro-geological parameters of the proposed area.

In addition to this, various other parameters like, soil testing, etc. need scientific study. Adequate capital provision was made in the approved PR (June 2020) for these miscellaneous studies also.

15.11 SAFETY ASPECTS FOR OUTSOURCING / HIRING OF HEMM

Special precaution should be taken while deploying workers of hiring/ out-sourcing agency in the mine. Before employing any labour to the mine, proper vocation training should be imparted and recommendations of recent Safety Conference should be strictly followed. Terms and conditions shall be fixed by management for deployment of labours by leaser of HEMM as well as machineries. Some of the major aspects are as follows :

A) <u>For persons</u> :

i) No persons shall be deployed unless he is trained at VTC

ii) Records of Vocational Training Certificate and driving licence of operators shall be kept by HEMM outsourcing agency and shall be made readily available for inspection by management.

iii) Salaries shall be distributed in front of management representative.

iv) No person shall be employed unless person holds VTC certificate and Management is informed. A record of it shall be maintained.

v) Adequate supervision shall be maintained by qualified competent persons.

B) <u>For Machineries</u>

i) All the machineries to be deployed in mines should be checked before deployment.

ii) Regular checking of m/c deployed by leaser of HEMM shall be done. No unfit m/c shall be deployed before the defect is rectified.

iii) A proper record of repair and maintenance alongwith inspection done by management and defect pointed out shall be maintained and signed by authorised person.

v) The trucks deployed by leaser of HEMM shall be provided with Audio visual alarms, proper light for use at night and period when natural light is not sufficient.

C) Other precautions for machines

i) RTO certificate photo copies of all vehicles shall be submitted to management.

ii) Daily welding, ,monitoring, inspection shall be done by the HEMM outsourcing agencies mechanic as directed by management.

iii) Machine manufacturers should be asked to give risk analysis.

iv) Suitable type of the fire extinguishers shall be provided in every machines.

D) General :

i) No person/vehicle shall be deployed at any place other than authorised place.

ii) All workers should obey lawful instruction of mine management.

iii) Risk Management Plan of tipper/pay loader shall be made and implemented.

16.1 ENVIRONMENT MANAGEMENT

STATUS OF EC OF EXISTING SASTI EXPANSION OCM

The existing Sasti OC mine has been granted environment clearance by MoEF& CC vide ref no. J-11015/435/2006-IA.II (M) Dt. 17.05.2007 for production capacity of 2.50 MTY within land area of 919.69 ha.

EC REQUIREMENT IN PROPOSED SCENARIO

The PR for Sasti Expansion OCM, 2.50 Mty (June, 2020) was approved in 324th meeting of WCL Board held on 04.08.2020 in Total hiring option with departmental Dragline in operation. The application for obtaining ToR was submitted to MoEF&CC in December, 2020. The standard ToR was issued by MoEF&CC vide No.J-11015/435/2006-IA.II(M) dated 02/01/2021 for a capacity 2.50 MTPA with increase in land area from 919.69 ha to 1120.48 ha.

This mining plan also proposes same production capacity of 2.50 MTPA and increasing ML area from 919.69 ha to 1120.48 ha. No change in production capacity and ML area is proposed in this Mining Plan. This mining plan is prepared to introduce the surface miner for coal extraction, survey-off of dragline and keeping the diversion of Gauri Nallah and widening of Sakhari Nallah as per the existing EC.

This Mining Plan (July, 2022) proposes the following amendments in the Approved PR (2.50Mty) June 2020:

1. Change in Technology
    a) Survey-off of 20/90 Departmental Dragline
    b) Deployment of Surface Miner for Coal Cutting
2. Diversion of Gauri Nala & Widening of Sakhari Nala – as proposed in the existing Environment clearance dated 17.05.2007.

The environment friendly surface miner is proposed to be introduced in this project to eliminate the three pollution sources namely drilling, blasting in coal seams and crushing of coal.

The environment clearance is proposed to be obtained for the same production capacity of 2.50 MTPA with increasing EC ML area from existing 919.69 ha to 1120.48 ha.

Comparison of Salient features of proposed Mining Plan (July, 2022) vis-à-vis Existing EC is given below:

Sl. No.	Parameters	Existing EC	Mining Plan (July ,2022)	Change/ remarks
1.	Capacity	2.50 MTPA	2.50 MTPA	No change
2.	Method of Mining			
2.(i)	Coal extraction	Drilling and blasting and Shovel Dumper	Surface Miner	Introduction of Surface miner will remove blasting in coal
2.(ii)	OB removal	Dragline for 25-30m OB above Coal & Shovel dumper combination for Parting & balance Top OB	Shovel-Dumper combination for Parting & entire Top OB	20/90 Walking Dragline to be surveyed-off

Sl. No.	Parameters	Existing EC	Mining Plan (July ,2022)	Change/ remarks
3.	Mine Area			
3.(i)	Within mine lease	903.09 ha	1104.18 Ha	Additional Land requirement for Dip-side Quarry
3.(ii)	Outside mine lease area	16.60	16.60	Area of Railway line
3.(iii)	Total Area	919.69 Ha	1120.48 Ha	Additional Land requirement for Dip-side Quarry
4.	Total Mineable reserves	28.42 Mt (as on 01.04.2004)	24.12 Mt (as on 01.04.2022)	Balance reserves as on 01.04.2022 is 24.12 Mt
5.	Mine life	20 years	11 years	1st year of Mining operation is 2022-23
6	Total OB removal (excluding re-handling)	152.24 Mm^3	228.38 Mm^3	Balance OB as on 01.04.2022 is 228.38 Mm^3

16.2 EXISTING ENVIRONMENTAL QUALITY

16.2.1 AIR QUALITY

The ambient air quality baseline data at 8 location was generated from October, 2020 to December, 2020 in core and buffer zone of Sasti OC. The existing air quality is provide below. This includes 2 locations in industrial area and 6 locations in residential area.

Sampling Location for Air Quality Monitoring

Sl. No.	Location Name/ Location Code	Description
1.	Manager Office, Sast Expn. OC (BSOA1)	Industrial area
2.	GM Office, Ballarpur area (BSOA2)	Industrial area
3.	Sasti Village (BSOA3)	Residential Area

Sl. No.	Location Name/ Location Code	Description
4.	Mathara village (BSOA4)	Residential Area
5.	Manoli village (BSOA5)	Residential Area
6.	Antargaon village (BSOA6)	Residential Area
7.	Goyegaon village (BSOA7)	Residential Area
8.	Gauri village (BSOA8)	Residential Area

Name of Monitoring Station: MANAGER OFFICE, SASTI OC

Name of Monitoring Station	Date of sampling	Parameters (In µg/m3)				
		SPM	PM10	PM2.5	NOX	SO2
MANAGER OFFICE	7.10.2020	165	110	45	20	13
MANAGER OFFICE	8.10.2020	96	56	32	15	11
MANAGER OFFICE	15.10.2020	112	60	37	16	BDL
MANAGER OFFICE	16.10.2020	82	46	26	14	BDL
MANAGER OFFICE	23.10.2020	104	58	29	16	11
MANAGER OFFICE	24.10.2020	114	62	35	18	12
MANAGER OFFICE	31.10.2020	105	60	38	16	12
MANAGER OFFICE	1.11.2020	98	56	35	14	11
MANAGER OFFICE	8.11.2020	110	64	40	19	12
MANAGER OFFICE	9.11.2020	106	62	39	16	BDL
MANAGER OFFICE	16.11.2020	105	63	35	16	BDL
MANAGER OFFICE	17.11.2020	109	62	38	16	BDL
MANAGER OFFICE	24.11.2020	103	61	33	14	BDL
MANAGER OFFICE	25.11.2020	100	60	35	16	BDL
MANAGER OFFICE	2.12.2020	98	58	36	15	BDL
MANAGER OFFICE	3.12.2020	99	53	32	14	BDL

Name of Monitoring Station	Date of sampling	Parameters (In µg/m3)				
		SPM	PM10	PM2.5	NOX	SO2
MANAGER OFFICE	10.12.2020	106	60	41	18	12
MANAGER OFFICE	11.12.2020	103	58	40	16	12
MANAGER OFFICE	18.12.2020	106	62	43	18	12
MANAGER OFFICE	19.12.2020	110	64	39	19	11
MANAGER OFFICE	24.12.2020	95	56	28	15	BDL
MANAGER OFFICE	25.12.2020	103	59	24	16	BDL
MANAGER OFFICE	30.12.2020	98	60	30	18	BDL
MANAGER OFFICE	31.12.2020	100	62	35	16	BDL
Minimum		82.00	46.00	24.00	14.00	11.00
Maximum		165.00	110.00	45.00	20.00	13.00
Average		105.29	61.33	35.21	16.29	11.73
98th percentile		141.54	88.84	44.08	19.54	12.80
TLV		600	300	60	120	120

Name of Monitoring Station: G.M OFFICE, Ballarpur area

Name of Monitoring Station	Date of sampling	Parameters (In µg/m3)				
		SPM	PM10	PM2.5	NOX	SO2
G.M OFFICE	7.10.2020	96	61	38	16	BDL
G.M OFFICE	8.10.2020	102	63	39	19	11
G.M OFFICE	15.10.2020	100	53	29	13	BDL
G.M OFFICE	16.10.2020	88	49	27	14	11
G.M OFFICE	23.10.2020	110	62	32	18	11
G.M OFFICE	24.10.2020	116	67	36	20	12
G.M OFFICE	31.10.2020	86	58	32	15	11
G.M OFFICE	1.11.2020	80	52	30	14	BDL
G.M OFFICE	8.10.2020	100	60	36	16	12

Name of Monitoring Station	Date of sampling	Parameters (In µg/m3)				
		SPM	PM10	PM2.5	NOX	SO2
G.M OFFICE	9.11.2020	104	64	39	18	12
G.M OFFICE	16.11.2020	106	65	38	16	BDL
G.M OFFICE	17.11.2020	104	63	33	14	BDL
G.M OFFICE	24.11.2020	100	60	32	16	BDL
G.M OFFICE	25.11.2020	102	62	34	14	BDL
G.M OFFICE	2.12.2020	104	58	38	15	BDL
G.M OFFICE	3.12.2020	98	54	34	14	BDL
G.M OFFICE	10.12.2020	95	53	30	12	BDL
G.M OFFICE	11.12.2020	110	59	39	16	BDL
G.M OFFICE	18.12.2020	105	54	34	14	BDL
G.M OFFICE	19.12.2020	108	56	29	16	BDL
G.M OFFICE	24.12.2020	98	50	26	14	BDL
G.M OFFICE	25.12.2020	100	48	24	16	BDL
G.M OFFICE	30.12.2020	94	49	22	14	BDL
G.M OFFICE	31.12.2020	75	41	20	12	BDL
Minimum		75.00	41.00	20.00	12.00	11.00
Maximum		116.00	67.00	39.00	20.00	12.00
Average		99.21	56.71	32.13	15.25	11.43
98th percentile		113.24	66.08	39.00	19.54	12.00
TLV		600	300	60	120	120

Name of Monitoring Station: SASTI VILLAGE

Name of Monitoring Station	Date of sampling	Parameters (In µg/m3)				
		SPM	PM10	PM2.5	NOX	SO2
SASTI VILLAGE	5.10.2020	84	40	22	11	BDL
SASTI VILLAGE	6.10.2020	80	38	20	12	BDL
SASTI VILLAGE	13.10.2020	83	41	23	13	BDL
SASTI VILLAGE	14.10.2020	86	43	24	14	BDL
SASTI VILLAGE	21.10.2020	92	40	22	12	BDL
SASTI VILLAGE	22.10.2020	68	32	22	15	BDL
SASTI VILLAGE	29.10.2020	86	40	23	13	BDL

Name of Monitoring Station	Date of sampling	Parameters (In µg/m3)				
		SPM	PM10	PM2.5	NOX	SO2
SASTI VILLAGE	30.10.2020	75	38	21	11	BDL
SASTI VILLAGE	6.11.2020	85	42	26	12	BDL
SASTI VILLAGE	7.11.2020	88	44	24	14	BDL
SASTI VILLAGE	14.11.2020	80	40	22	12	BDL
SASTI VILLAGE	15.11.2020	78	38	20	12	BDL
SASTI VILLAGE	22.11.2020	88	40	21	13	BDL
SASTI VILLAGE	23.11.2020	86	42	27	14	BDL
SASTI VILLAGE	30.11.2020	87	43	25	11	BDL
SASTI VILLAGE	1.12.2020	65	34	20	11	BDL
SASTI VILLAGE	8.12.2020	90	46	27	14	BDL
SASTI VILLAGE	9.12.2020	86	42	23	13	BDL
SASTI VILLAGE	16.12.2020	88	44	26	12	BDL
SASTI VILLAGE	17.12.2020	80	40	20	13	BDL
SASTI VILLAGE	22.12.2020	78	39	18	11	BDL
SASTI VILLAGE	23.12.2020	83	41	22	12	BDL
SASTI VILLAGE	28.12.2020	71	38	20	12	BDL
SASTI VILLAGE	29.12.2020	75	39	21	13	BDL
Minimum		65	32	18	11	BDL
Maximum		92	46	27	15	BDL
Average		81.75	40.17	22.46	12.50	BDL
98th percentile		91.08	45.08	27	14.54	BDL
TLV		200	100	60	80	80

Name of Monitoring Station: MATHARA VILLAGE

Name of Monitoring Station	Date of sampling	Parameters (In µg/m3)				
		SPM	PM10	PM2.5	NOX	SO2
MATHARA VILLAGE	5.10.2020	78	42	21	12	BDL
MATHARA VILLAGE	6.10.2020	75	35	18	11	BDL
MATHARA VILLAGE	13.10.2020	79	43	24	12	BDL
MATHARA VILLAGE	14.10.2020	71	36	23	12	BDL
MATHARA VILLAGE	21.10.2020	73	34	20	11	BDL

Name of Monitoring Station	Date of sampling	Parameters (In µg/m3)				
		SPM	PM10	PM2.5	NOX	SO2
MATHARA VILLAGE	22.10.2020	74	36	26	11	BDL
MATHARA VILLAGE	29.10.2020	80	48	25	12	BDL
MATHARA VILLAGE	6.11.2020	81	41	21	14	BDL
MATHARA VILLAGE	7.11.2020	83	43	24	16	BDL
MATHARA VILLAGE	14.11.2020	80	45	22	12	BDL
MATHARA VILLAGE	15.11.2020	78	38	18	11	BDL
MATHARA VILLAGE	22.11.2020	76	39	20	12	BDL
MATHARA VILLAGE	23.11.2020	80	41	24	13	BDL
MATHARA VILLAGE	30.11.2020	75	38	18	11	BDL
MATHARA VILLAGE	1.12.2020	78	42	20	12	BDL
MATHARA VILLAGE	8.12.2020	80	49	27	13	BDL
MATHARA VILLAGE	9.12.2020	84	52	29	14	BDL
MATHARA VILLAGE	16.12.2020	74	40	19	11	BDL
MATHARA VILLAGE	17.12.2020	78	44	29	12	BDL
MATHARA VILLAGE	22.12.2020	80	43	22	13	BDL
MATHARA VILLAGE	23.12.2020	83	55	24	14	BDL
MATHARA VILLAGE	28.12.2020	71	38	20	12	BDL
MATHARA VILLAGE	29.12.2020	90	64	30	14	BDL
MATHARA VILLAGE	30.12.2020	80	45	24	13	BDL
Minimum		71	34	18	11	BDL
Maximum		90	64	30	16	BDL
Average		78.38	42.96	22.83	12.42	BDL
98th percentile		87.24	59.86	29.54	15.08	BDL
TLV		200	100	60	80	80

Name of Monitoring Station: MANOLI VILLAGE

Name of Monitoring Station	Date of sampling	Parameters (In µg/m3)				
		SPM	PM10	PM2.5	NOX	SO2
MANOLI VILLAGE	5.10.2020	86	42	26	13	BDL
MANOLI VILLAGE	6.10.2020	85	41	20	12	BDL
MANOLI VILLAGE	13.10.2020	82	42	25	13	BDL

Name of Monitoring Station	Date of sampling	Parameters (In µg/m3)				
		SPM	PM10	PM2.5	NOX	SO2
MANOLI VILLAGE	14.10.2020	80	40	24	12	BDL
MANOLI VILLAGE	21.10.2020	96	52	27	14	BDL
MANOLI VILLAGE	22.10.2020	91	50	28	14	BDL
MANOLI VILLAGE	6.11.2020	85	46	23	15	BDL
MANOLI VILLAGE	7.11.2020	88	47	27	16	BDL
MANOLI VILLAGE	14.11.2020	90	49	30	15	BDL
MANOLI VILLAGE	15.11.2020	89	47	26	16	BDL
MANOLI VILLAGE	22.11.2020	85	45	19	14	BDL
MANOLI VILLAGE	23.11.2020	80	42	21	12	BDL
MANOLI VILLAGE	30.11.2020	80	43	18	12	BDL
MANOLI VILLAGE	1.12.2020	74	42	24	12	BDL
MANOLI VILLAGE	8.12.2020	82	44	26	13	BDL
MANOLI VILLAGE	9.12.2020	85	48	30	14	BDL
MANOLI VILLAGE	16.12.2020	88	50	32	15	BDL
MANOLI VILLAGE	17.12.2020	75	40	26	11	BDL
MANOLI VILLAGE	24.12.2020	70	38	18	12	BDL
MANOLI VILLAGE	25.12.2020	79	43	20	13	BDL
MANOLI VILLAGE	30.12.2020	76	39	19	11	BDL
MANOLI VILLAGE	31.12.2020	88	48	27	14	BDL
MANOLI VILLAGE	29.10.2020	75	42	16	12	BDL
MANOLI VILLAGE	30.10.2020	80	44	19	12	BDL
Minimum		70.00	38.00	16.00	11.00	BDL
Maximum		96.00	52.00	32.00	16.00	BDL
Average		82.88	44.33	23.79	13.21	BDL
98th percentile		93.70	51.08	31.08	16.00	BDL
TLV		200	100	60	80	80

Name of Monitoring Station: ANTARGAON VILLAGE

Name of Monitoring Station	Date of sampling	Parameters (In µg/m3)				
		SPM	PM10	PM2.5	NOX	SO2
ANTARGAON VILLAGE	7.10.2020	79	42	28	12	BDL
ANTARGAON VILLAGE	8.10.2020	70	39	21	11	BDL
ANTARGAON VILLAGE	15.10.2020	88	52	32	12	BDL
ANTARGAON VILLAGE	16.10.2020	74	46	30	13	BDL
ANTARGAON VILLAGE	23.10.2020	86	50	34	12	BDL
ANTARGAON VILLAGE	24.10.2020	84	48	26	12	BDL
ANTARGAON VILLAGE	31.10.2020	88	48	28	14	BDL
ANTARGAON VILLAGE	1.11.2020	83	45	26	13	BDL
ANTARGAON VILLAGE	8.11.2020	89	47	28	14	BDL
ANTARGAON VILLAGE	9.11.2020	90	49	30	16	BDL
ANTARGAON VILLAGE	16.11.2020	88	46	26	14	BDL
ANTARGAON VILLAGE	17.11.2020	85	45	24	13	BDL
ANTARGAON VILLAGE	24.11.2020	81	41	28	12	BDL
ANTARGAON VILLAGE	25.11.2020	82	42	30	13	BDL
ANTARGAON VILLAGE	2.12.2020	79	39	26	14	BDL
ANTARGAON VILLAGE	3.12.2020	80	40	28	12	BDL
ANTARGAON VILLAGE	10.12.2020	84	42	30	13	BDL
ANTARGAON VILLAGE	11.12.2020	83	43	34	14	BDL
ANTARGAON VILLAGE	18.12.2020	84	44	36	14	BDL
ANTARGAON VILLAGE	19.12.2020	83	43	28	13	BDL
ANTARGAON VILLAGE	24.12.2020	80	40	26	11	BDL
ANTARGAON VILLAGE	25.12.2020	81	42	22	12	BDL
ANTARGAON VILLAGE	30.12.2020	78	40	20	11	BDL
ANTARGAON VILLAGE	31.12.2020	79	42	18	12	BDL
Minimum		70.00	39.00	18.00	11.00	BDL
Maximum		90.00	52.00	36.00	16.00	BDL
Average		82.42	43.96	27.46	12.79	BDL
98th percentile		89.54	51.08	35.08	15.08	BDL
TLV		200	100	60	80	80

Name of Monitoring Station: GOYEGAON VILLAGE

Name of Monitoring Station	Date of sampling	Parameters (In µg/m3)				
		SPM	PM10	PM2.5	NOX	SO2
GOYEGAON VILLAGE	7.10.2020	93	62	35	14	BDL
GOYEGAON VILLAGE	8.10.2020	75	40	28	11	BDL
GOYEGAON VILLAGE	13.10.2020	86	45	23	13	BDL
GOYEGAON VILLAGE	14.10.2020	94	61	34	16	BDL
GOYEGAON VILLAGE	15.10.2020	80	42	26	12	BDL
GOYEGAON VILLAGE	16.10.2020	78	40	22	11	BDL
GOYEGAON VILLAGE	23.10.2020	86	48	31	14	BDL
GOYEGAON VILLAGE	24.10.2020	89	56	32	15	BDL
GOYEGAON VILLAGE	31.10.2020	82	47	29	14	BDL
GOYEGAON VILLAGE	1.11.2020	80	45	24	13	BDL
GOYEGAON VILLAGE	8.11.2020	86	54	33	15	BDL
GOYEGAON VILLAGE	9.11.2020	88	49	31	16	BDL
GOYEGAON VILLAGE	16.11.2020	94	63	36	18	BDL
GOYEGAON VILLAGE	17.11.2020	82	46	27	16	BDL
GOYEGAON VILLAGE	24.11.2020	78	41	22	14	BDL
GOYEGAON VILLAGE	25.11.2020	86	51	31	13	BDL
GOYEGAON VILLAGE	2.12.2020	87	46	29	14	BDL
GOYEGAON VILLAGE	3.12.2020	81	42	26	11	BDL
GOYEGAON VILLAGE	10.12.2020	80	41	18	11	BDL
GOYEGAON VILLAGE	11.12.2020	82	43	17	12	BDL
GOYEGAON VILLAGE	18.12.2020	84	45	22	13	BDL
GOYEGAON VILLAGE	19.12.2020	80	41	26	12	BDL
GOYEGAON VILLAGE	24.12.2020	89	57	34	14	BDL
GOYEGAON VILLAGE	25.12.2020	86	52	32	14	BDL
Minimum		75.00	40.00	17.00	11.00	BDL
Maximum		94.00	63.00	36.00	18.00	BDL
Average		84.42	48.21	27.83	13.58	BDL
98th percentile		94.00	62.54	35.54	17.08	BDL
TLV		200	100	60	80	80

Name of Monitoring Station: GAURI VILLAGE

Name of Monitoring Station	Date of sampling	Parameters (In µg/m3)				
		SPM	PM10	PM2.5	NOX	SO2
GAURI VILLAGE	3.10.2020	119	83	44	20	BDL
GAURI VILLAGE	4.10.2020	121	83	30	18	BDL
GAURI VILLAGE	11.10.2020	119	77	28	20	BDL
GAURI VILLAGE	12.10.2020	123	75	42	22	BDL
GAURI VILLAGE	19.10.2020	115	77	39	20	BDL
GAURI VILLAGE	20.10.2020	117	81	42	22	BDL
GAURI VILLAGE	27.10.2020	115	79	37	20	BDL
GAURI VILLAGE	28.10.2020	117	80	34	19	BDL
GAURI VILLAGE	9.11.2020	119	83	30	19	BDL
GAURI VILLAGE	5.11.2020	121	84	39	18	BDL
GAURI VILLAGE	12.11.2020	118	80	43	18	BDL
GAURI VILLAGE	13.11.2020	113	82	36	19	BDL
GAURI VILLAGE	20.11.2020	115	81	36	18	BDL
GAURI VILLAGE	21.11.2020	113	76	40	17	BDL
GAURI VILLAGE	28.11.2020	115	77	36	18	BDL
GAURI VILLAGE	29.11.2020	113	75	30	19	BDL
GAURI VILLAGE	6.12.2020	109	73	38	17	BDL
GAURI VILLAGE	7.12.2020	114	76	33	18	BDL
GAURI VILLAGE	14.12.2020	116	81	44	18	BDL
GAURI VILLAGE	15.12.2020	115	84	34	18	BDL
GAURI VILLAGE	22.12.2020	113	77	44	19	BDL
GAURI VILLAGE	23.12.2020	109	75	38	17	BDL
GAURI VILLAGE	28.12.2020	118	77	40	18	BDL
GAURI VILLAGE	29.12.2020	111	75	36	17	BDL
Minimum		109.00	73.00	28.00	17.00	BDL
Maximum		123.00	84.00	44.00	22.00	BDL
Average		115.75	78.79	37.21	18.71	BDL
98th percentile		122.08	84.00	44.00	22.00	BDL
TLV		200	100	60	80	80

Observation

The ambient air quality in core and buffer zone was found to be within permissible limits as per GSR 742 (E), 2000 and NAAQS, 2009. Within the residential areas, highest PM10 concentration of 84.00 µg/m^3 was observed at Gauri Village due to its proximity from the coal mines.

16.2.2 WATER QUALITY

The baseline water quality monitoring was carried out in October, 2020. The water quality of Mine discharge and ETP discharge are provided below.

Name of Monitoring Station: SASTI OC
Sample Description: Mine Water Discharge **Date of Monitoring: 7.10.2020**

Sl. No	Parameters	Test Method	Detection Limit	Standard for discharge Part A, Schedule VI	Analysis Result
1	pH Value	IS-3025/11:1983 Electrometric	0.2	5.5 to 9.0	8.01
2	Temperature (0C)	IS 3025 (Part 9) : 1984, Thermometric	4°	Te < Ts + 5OC	27
3	Colour (Hz)	APHA, 23rd Edition Platinum Cobalt	1	*	2
4	Odour	IS 3025 /05:1983, Physical, Qualitative	--	Unobjectionable	Unobjectionable
5	TSS –mg/l	IS-3025/17:1984 Gravimetric	10	100	36
6	Oil & Grease –mg/l	IS-3025/39:1991 Partition Gravimetric	2	10	BDL
7	C.O.D. – mg/l	APHA, 23rd Edition Closed Reflux	4	250	44
8	B.O.D. (3 days at 270C)-mg/l	IS 3025 (Part 44) : 1993	2	30	5
9	Residual Chlorine - mg/l	APHA, 23rd Edition DPD	0.02	1	BDL
10	Ammonical Nitrogen- mg/l	IS 3025 (Part 34) : 1988	0.02	50	0.5

Sl. No	Parameters	Test Method	Detection Limit	Standard for discharge Part A, Schedule VI	Analysis Result
11	Total Kjeldahl Nitrogen-mg/l	APHA, 23rd Edition Kjeldahl	1	100	5.3
12	Dissolved Phosphate – mg/l	APHA, 23rd Edition Molybdovanadate	0.3	5	0.36
13	Arsenic -mg/l	APHA, 23rd Edition AAS-VGA	0.005	0.2	BDL
14	Lead -mg/l	APHA, 23rd Edition AAS-GTA	0.007	0.1	BDL
15	Hexavalent Chromium - mg/l	APHA, 23rd Edition 1,5-Diphenylcarbohydrazide	0.01	0.1	BDL
16	Total Chromium - mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.06	2	BDL
17	Copper - mg/l	IS-3025/42:1992 AAS-Flame	0.03	3	BDL
18	Zinc -mg/l	IS-3025/49:1994 AAS-Flame	0.01	5	BDL
19	Selenium – mg/l	APHA, 23rd Edition AAS-VGA	0.005	0.05	BDL
20	Nickel -mg/l	IS 3025 (Part 54) : 2003, AAS-Flame Method	0.1	3	BDL
21	Cadmium - mg/l	APHA, 23rd Edition AAS-GTA	0.005	2	BDL
22	Fluoride - mg/l	APHA, 23rd Edition SPADNS	0.02	2	0.60
23	Sulphide – mg/l	APHA, 23rd Edition Methylene blue	0.1	2	BDL
24	Iron -mg/l	IS-3025/53:2003 AAS-Flame	0.06	3	BDL
25	Manganese - mg/l	IS-3025/59:2006 AAS-Flame	0.02	2	BDL
26	Nitrate Nitrogen - mg/l	APHA, 23rd Edition UV-Spectrophotometric	0.5	10	3.1

Name of Monitoring Station: SASTI OC
Sample Description: ETP Discharge **Date of Monitoring: 7.10.2020**

Sl. No	Parameters	Test Method	Below Detection Limit	Standard for discharge Part A, Schedule VI	Analysis Result
1	pH Value	IS-3025/11:1983 Electrometric	0.2	5.5 to 9.0	7.5
2	Temperature (0C)	IS 3025 (Part 9) : 1984, Thermometric	4°	Te < Ts + 5OC	27
3	Colour (Hz)	APHA, 23rd Edition Platinum Cobalt	1	*	2
4	Odour	IS 3025 /05:1983, Physical, Qualitative	--	Unobjection-able	Unobjection-able
5	TSS –mg/l	IS-3025/17:1984 Gravimetric	10	100	34
6	Oil & Grease – mg/l	IS-3025/39:1991 Partition Gravimetric	2	10	BDL
7	C.O.D. – mg/l	APHA, 23rd Edition Closed Reflux	4	250	48
8	B.O.D. (3 days at 270C)-mg/l	IS 3025 (Part 44) : 1993	2	30	2
9	Residual Chlorine - mg/l	APHA, 23rd Edition DPD	0.02	1	BDL
10	Ammonical Nitrogen- mg/l	IS 3025 (Part 34) : 1988	0.02	50	0.4
11	Total Kjeldahl Nitrogen- mg/l	APHA 23rd Edition Kjeldahl	1	100	5.1
12	Dissolved Phosphate – mg/l	APHA, 23rd Edition Molybdovanadate	0.3	5	0.32
13	Arsenic - mg/l	APHA, 23rd Edition AAS-VGA	0.005	0.2	BDL
14	Lead -mg/l	APHA, 23rd Edition AAS-GTA	0.007	0.1	BDL
15	Hexavalent Chromium - mg/l	APHA, 23rd Edition 1,5-Diphenylcarbohydrazide	0.01	0.1	BDL
16	Total Chromium - mg/l	IS 3025 (Part 52) : 2003 AAS-Flame	0.06	2	BDL

Sl. No	Parameters	Test Method	Below Detection Limit	Standard for discharge Part A, Schedule VI	Analysis Result
17	Copper - mg/l	IS-3025/42:1992 AAS-Flame	0.03	3	BDL
18	Zinc -mg/l	IS-3025/49:1994 AAS-Flame	0.01	5	BDL
19	Selenium – mg/l	APHA, 23rd Edition AAS-VGA	0.005	0.05	BDL
20	Nickel -mg/l	IS 3025 (Part 54) : 2003, AAS-Flame Method	0.1	3	BDL
21	Cadmium - mg/l	APHA, 23rd Edition AAS-GTA	0.005	2	BDL
22	Fluoride - mg/l	APHA, 23rd Edition SPADNS	0.02	2	0.5
23	Sulphide – mg/l	APHA, 23rd Edition Methylene blue	0.1	2	BDL
24	Iron -mg/l	IS-3025/53:2003 AAS-Flame	0.06	3	BDL
25	Manganese - mg/l	IS-3025/59:2006 AAS-Flame	0.02	2	BDL
26	Nitrate Nitrogen- mg/l	APHA, 23rd Edition UV-Spectrophotometric	0.5	10	6

Observation

The water quality parameters of the mine discharge water sample and ETP treated water discharge were found to be within permissible limits.

16.2.3 NOISE LEVEL QUALITY

The baseline noise level monitoring has been carried out from October, 2020 to December, 2020 at 8 locations in core and buffer zone of Sasti OC. The details of locations is provided below:

Sampling Location for Air Quality Monitoring

Sl. No.	Location Name/ Location Code	Description
1.	Manager Office, Sast Expn. OC (BSOA1)	Industrial area
2.	GM Office, Ballarpur area (BSOA2)	Industrial area
3.	Sasti Village (BSOA3)	Residential Area

Sl. No.	Location Name/ Location Code	Description
4.	Mathara village (BSOA4)	Residential Area
5.	Manoli village (BSOA5)	Residential Area
6.	Antargaon village (BSOA6)	Residential Area
7.	Goyegaon village (BSOA7)	Residential Area
8.	Gauri village (BSOA8)	Residential Area

The noise level obtained during the monitoring is provided below:

Name of Monitoring Station: MANAGER OFFICE, Sasti OC

Monitoring Location	DATE OF DATA COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
MANAGER OFFICE	14.10.2020	56.4	54.5
MANAGER OFFICE	22.10.2020	56.2	54.1
MANAGER OFFICE	12.11.2020	56.7	55.6
MANAGER OFFICE	28.11.2020	56.6	55.5
MANAGER OFFICE	14.12.2020	56.8	55.6
MANAGER OFFICE	28.12.2020	56.9	55.7
Minimum		56.2	54.1
Maximum		56.9	55.7
98th percentile		56.89	55.69
Average		56.6	55.17
TLV		75	70

Name of Monitoring Station: G.M OFFICE, Ballarpur area

Monitoring Location	DATE OF DATA COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
G.M OFFICE	14.10.2020	54.2	53.2
G.M OFFICE	22.10.2020	56.3	55.1
G.M OFFICE	12.11.2020	57.8	56.0
G.M OFFICE	28.11.2020	54.2	53.1

Monitoring Location	DATE OF DATA COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
G.M OFFICE	14.12.2020	55.9	55.6
G.M OFFICE	28.12.2020	55.8	54.7
Minimum		54.2	53.1
Maximum		57.8	56.0
98th percentile		57.65	55.96
Average		55.7	54.62
TLV		75	70

Name of Monitoring Station: SASTI VILLAGE

Monitoring Location	DATE OF DATA COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
SASTI VILLAGE	14.10.2020	40.2	39.8
SASTI VILLAGE	22.10.2020	41.3	40.1
SASTI VILLAGE	12.11.2020	42.6	41.0
SASTI VILLAGE	28.11.2020	44.6	43.2
SASTI VILLAGE	14.12.2020	47.2	43.9
SASTI VILLAGE	28.12.2020	45.2	43.9
Minimum		40.2	39.8
Maximum		47.2	43.9
98th percentile		47.0	43.9
Average		43.52	41.98
TLV		55	45

Name of Monitoring Station: MATHARA VILLAGE

Monitoring Location	DATE OF DATA COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
MAATHRA VILLAGE	14.10.2020	40.9	39.4
MAATHRA VILLAGE	22.10.2020	42.3	41.5
MAATHRA VILLAGE	12.11.2020	44.2	43.2
MAATHRA VILLAGE	28.11.2020	40.9	39.9

Monitoring Location	DATE OF DATA COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
MAATHRA VILLAGE	14.12.2020	39.8	38.5
MAATHRA VILLAGE	28.12.2020	40.1	39.9
Minimum		39.8	38.5
Maximum		44.2	43.2
98th percentile		44.01	43.03
Average		41.37	40.4
TLV		55	45

Name of Monitoring Station: MANOLI VILLAGE

Monitoring Location	DATE OF DATA COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
MANOLI VILLAGE	14.10.2020	41.0	40.0
MANOLI VILLAGE	22.10.2020	39.2	38.5
MANOLI VILLAGE	12.11.2020	42.3	40.9
MANOLI VILLAGE	28.11.2020	45.1	43.6
MANOLI VILLAGE	14.12.2020	46.3	44.0
MANOLI VILLAGE	28.12.2020	44.2	43.9
Minimum		42.9	40.1
Maximum		45.4	43.9
Monitoring Location		NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
98th percentile		45.37	43.76
Average		44.28	41.66
TLV		55	45

Name of Monitoring Station: GOYEGAON VILLAGE

Monitoring Location	DATE OF DATA COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
GOYEGAON VILLAGE	14.10.2020	42.7	41.6
GOYEGAON VILLAGE	22.10.2020	44.5	43.2
GOYEGAON VILLAGE	12.11.2020	41.0	39.9

Monitoring Location	DATE OF DATA COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
GOYEGAON VILLAGE	28.11.2020	47.5	45.8
GOYEGAON VILLAGE	14.12.2020	44.2	42.5
GOYEGAON VILLAGE	28.12.2020	43.9	41.9
Minimum		41.0	39.9
Maximum		47.5	45.8
98th percentile		47.2	45.54
Average		43.97	42.48
TLV		55	45

Name of Monitoring Station: ANTARGAON VILLAGE

Monitoring Location	DATE OF DATA COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
ANTARGAON VILLAGE	14.10.2020	43.1	42.6
ANTARGAON VILLAGE	22.10.2020	44.1	42.1
ANTARGAON VILLAGE	12.11.2020	44.0	43.6
ANTARGAON VILLAGE	28.11.2020	42.0	41.7
ANTARGAON VILLAGE	14.12.2020	38.2	37.2
ANTARGAON VILLAGE	28.12.2020	39.9	38.4
Minimum		38.2	37.2
Maximum		44.1	43.6
Monitoring Location		NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
98th percentile		44.09	43.5
Average		41.88	40.93
TLV		55	45

Name of Monitoring Station: GAURI VILLAGE

Monitoring Location	DATE OF DATA COLLECTION	NOISE LEVEL IN dB(A)	
		DAY TIME	NIGHT TIME
GAURI VILLAGE	14.10.2020	42.5	41.2
GAURI VILLAGE	22.10.2020	44.1	43.2
GAURI VILLAGE	12.11.2020	42.1	40.2
GAURI VILLAGE	28.11.2020	41.9	40.3
GAURI VILLAGE	14.12.2020	43.9	42.5
GAURI VILLAGE	28.12.2020	44.2	42.1
Minimum		41.9	40.2
Maximum		44.2	43.2
98th percentile		44.19	43.13
Average		43.12	41.58
TLV		55	45

16.2.4 Water Consumption for different Activities

COLONY WATER DEMAND

No additional quarter has been proposed in this Mining Plan, it is proposed that the colony water demand will be met by existing system.

Sl No.	Particulars	Unit	Departmental Option
(i)	Manpower	Nos	1114
(ii)	Total No. of houses required	Nos	580
(iii)	No of existing qtrs	Nos	886
(iv)	No of qtrs to be provided	Nos	580
1	Residential Population @ 5 person per house	Nos	2900
2	Non Residential workers	Nos	534
A	Water Demand for Colony		
(i)	Water requirement for residential population @ 135 litre per capita per day	lpd	391500

Sl No.	Particulars	Unit	Departmental Option
(ii)	Water requirement for Welfare/ community buildings to be located in the colony @ 10 % of item (A) (I) above	lpd	39150
(iii)	Process and other losses @ 10% of (A) (I) & (ii)		43065
	Total of (A)	lpd	473715
	Say	lpd	474000
		Kl	**474**

INDUSTRIAL WATER DEMAND

Water demand for project site includes water to be supplied for manpower engaged in the project, dust suppression, firefighting, water sprinkling on roads, etc. The total water requirement for project site has been worked out to 620 KLD in Departmental option and same demand has been adopted keeping in view the water requirement of out-sourcing agency. The calculation of Industrial water demand for the proposed project is tabulated below:

Sl. No.	Particulars	Unit	Qty
	Capacity:	Mty	2.50
	No. of Dumpers	No.	75
	No. of Dozers	No.	15
a)	Water requirement for total manpower of Project @ 45 litre/capita/day	lpd	50130
b)	Water requirement for washing of dumpers @ 1800 litre/ dumper/day	lpd	162000
c)	Water requirement for dust suppression in CHP & other industrial premises @22500 litre/ day/million tonne of coal production per year	lpd	56250
d)	Water requirement for fire fighting @45000 litre/ day/million tonne of coal production per year	lpd	112500
e)	Water requirement for road watering @ 67500 litre/ day/million tonne of coal production per year	lpd	168750

Sl. No.	Particulars	Unit	Qty
f)	Water requirement of Service Buildings @ 10% of item (a) of above	lpd	5010
g)	Allowance for loss & wastage @ 10% (a) to(f)	lpd	55500
	Total Water Demand	lpd	610140
	Say	lpd	620000
		Kl	**620**

16.2.5 Raw Material Consumption

S.No.	Particular	Units	Annual Quantity
1	Fuel (Diesel)	KL / Year	4435
2	Power Consumption	kWh / Year	9248325
3	Explosives	kg / Year	6469000

16.2.6 Hazardous Waste

Hazardous waste such as spent oil, ETP sludge, battery waste etc will be generated during the mining activities which will be disposed as per the statutory requirement such as hazardous Waste Management Rules, 2016 and other applicable rules issued and updated by MoEF&CC.

16.2.7 Solid Waste

Total volume of OB to be removed from quarry of the proposed mine has been assessed as 446.77 Mm^3 out of which Top BC Soil is 40.71 Mm^3. In the existing Sasti OC, 171.54 Mm^3 of OB has been backfilled.

In this Mining Plan, out of total 228.38 Mm^3 of OB, 220.68 Mm^3 of OB is proposed to be backfilled. The mining sequence is proposed in such a way that maximum quantity of overburden is backfilled with the mine itself. Thus minimizing the precious land resource degradation due to the external OB dump.

Project	Total waste generation (Mm^3)	Top soil (Mm^3)	Total OB generation (Mm^3)	Total OB in Ext. Dump (Mm^3)	Total OB Backfilled (Mm^3)
Original project	218.39	29.08	189.31	46.85	171.54
Expansion Project (Balance Life)	228.38	11.63	216.75	7.70	220.68
Total (Mm^3)	446.77	40.71	406.06	54.55	392.22

From above, it is clear that about 93 % of total OB will be accommodated in Internal dumps and rest 7 % OB will be dumped in External OB dump and Embankment.

16.3 ANTICIPATED ENVIRONMENT IMPACT & MITIGATION MEASURES

16.7.1 Air Pollution Control Measures

Mining operation and associated activities are potentially air polluting and the major air pollutant is the suspended particulate matter. Most of the air pollution problems are due to fugitive dust emission. This is an existing mine in which many pollution control measures are already implemented.

Existing pollution control measures implemented in the mine are provided below:

1. Fixed sprinklers are provided at 100 MT weighbridge - 08 Nos.
2. Fixed sprinklers are provided at Main CHP - 06 Nos.
3. Rain guns are provided around coal stock yard – 17 nos
4. Along Coal transportation road – 04 nos
5. Fixed Sprinklers at Sasti Rly. Siding– 10 nos.
6. Crusher unloading Area of both mini CHP & Main CHP are enclosed with CGI sheet and sprinklers are provided at crusher.
7. Concrete pavement provided at coal unloading Area and loading point at mini CHP.
8. Concrete pavement is provided at coal unloading Area and loading point at Main CHP.
9. Conveyor belt of mini CHP and main CHP are enclosed with CGI sheets along with sprinklers.

10. Brooming and maintenance of coal transport road and weigh bridge road is done regularly.

11. Spraying of water by 4 Nos. of Mobile Water Tankers (Hired-2 nos. of 16KL, Departmental – 2nos. of 28KL and 18 KL)

12. Concrete pavement is provided in w/s complex.

13. Coal carrying Trucks are covered with Tarpaulin.

14. Tarring of 6.00 km length of internal roads used by Coal Transportation trucks

The air quality impact assessment will be carried out with application of the Gaussian plume model, recommended by USEPA under the name AERMOD Modelling System. It is a steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain (USEPA, 2005). The intensity of dust generation in the mining is influenced by factors such as hardness of rock, mining technology and material handling etc. Use of surface miner has eliminated the dust generation due to drilling, blasting and crushing of coal.

The major technological changes has been proposed for air pollution control in this Mining plan is introduction of Surface Miner for cutting of Coal, which will remove the need of blasting in coal.

The financial provisions made on the air pollution control is provided below:

Sl. No.	Particulars	Capital (Rs.Lakhs)
1	Fogging machines for Dust control measures.	60
2	Continuous Ambient Air Quality Monitoring Station(CAQMS)	75
3	Installation of fixed type sprinklers on haul roads, transportation of coal route, CHP loading & unloading points and other dust generation sources etc.	80
4	10-30m of plantation for green belt along mine boundary for approx 14.00 km to control air pollution	70
	Total	285

16.7.2 Water Pollution Control Measures

Sasti is an existing coal mine. The sedimentation tank of treatment of mine discharge water, ETP for treatment of workshop effluent water discharge and Sewage Treatment Plan for colony wastewater has been already provided in the existing mine.

Following enhanced water treatment measures along with ground water level monitoring piezometers are proposed in this Mining Plan:

Sl. No.	Particulars	Capital (Rs.Lakhs)
1	Sedimentation Pond for Treatment of Mine Waste water	25
2	Effluent Treatment Plant modification for treatment of Workshop Effluent	25
3	Sewarage Treatment Plant	75
4	Installation of Piezometer with telemetry	25
	Total	150

16.7.3 Noise Level Management

Monitoring of the noise control is carried out on regular basis as per the Environment (Protection) Amendment Rule 2000. While planning for an effective noise attenuation measures, the concept of source, path and receiver are considered. The blasting is carried out as per DGMS guidelines. A thick greenbelt 10-30 meter wide along the mine boundary is proposed.

16.7.4 Land Reclamation

Due to increase in land for quarry in dip-side, the mine lease area will increase from earlier 919.69 ha to 1120.48 ha. Expanding the existing coal mines provides an opportunity to increase the coal production without wasting additional land required for the external OB dump. As existing void of the mine provides ample space for the internal dumping in case of favorable geological conditions. Same principal has been followed in this expansion project.

The mine has been planned to ensure not only the conservation of coal but also conservation of the precious land resource.

The major part of OB (93%) is proposed to be dumped in the internal dump and only 7% OB will be dumped externally (on existing external dump) including embankment. No additional land is proposed to be acquired for the external OB dump. About 220.68 Mm^3 of OB out of the total 228.38 Mm^3 is proposed to be backfilled in the existing quarry. Thus saving at least 350-400 ha of agriculture land from degradation due to external dump.

The additional land required is for the extension of the quarry in dip side (219.84 ha) and rationalization of mine boundary between Sasti OC and Dhuptala OC (9 ha). In the existing mine the quarry limit is upto the maximum 150 meter depth. It is proposed to extend the quarry to 200 meter depth upto F_8-F_8 fault. The proposed additional land required is predominantly agriculture land. The land use will change from agriculture to the coal quarry.

The quarry area is increasing by 200.79 ha in the expansion proposal i.e. from 344.0 ha to 544.79 ha. Most of the additional land area proposed for acquisition will be utilized for the excavation.

Land use during mining is provided below:

Sl. No.	**Particulars**	**Area (ha) As per Existing EC**	**Area (ha) As per Proposed Mining Plan**
1	Entire Quarry Area	344.00	544.79
2	External OB dump including top soil dump	235.30	202.52
3	Infrastructure including Railway Siding and Road	57.92	79.52
4	Embankment	32.72	37.80
5	Area needed for rationalization including safety and blasting zone	233.15	239.25
6	Outside ML area	16.60	16.60
	Total Land	**919.69**	**1120.48**

Post mining land use after reclamation is provided below:

Sl. No.	Land use during mining	Land use (ha)				
		Plantation	Water Body	Public use	Undisturbed	Total
1	External OB Dump	149.54	-	-	-	149.54
2	Top Soil Dump	52.98	-	-	-	52.98
3	Excavation	275.89	268.90	-	-	544.79
4	Roads	5.00	-	15.00	-	20.00
5	Built up area (Infrastructure)	20.00	-	39.52	-	59.52
6	Undisturbed Area (Including safety zone of blasting, OB Dump & Area under rationalization)	172.000	-	-	67.25	239.25
7	Embankment around quarry	10.00	-	27.80	-	37.80
8	Outside ML Area	1.000	-	15.600	-	16.60
	Total	**686.41**	**268.90**	**97.92**	**67.25**	**1120.48**

Green-belt area is included in all heads under plantation

Stage-wise land use plan is provided below:

Sl. No.	Land use category	2022-23 (1st year)	5th year	End of Mine Life (11th Year)	Post Mining
1	Backfilled Area	166.35	157.00	275.89	275.89
	(Reclaimed with plantation)	*20.75*	*37.50*	*127.50*	*275.89*
2	Excavated Area (Not reclaimed)/void	177.65	323.00	268.90	268.90

Sl. No.	Land use category	2022-23 (1st year)	5th year	End of Mine Life (11th Year)	Post Mining
3	External OB dump	167.050	149.540	149.54	149.54
	(Reclaimed with plantation)	*100.80*	*110.80*	*149.54*	*149.54*
4	Top soil dump	47.98	52.980	52.98	52.98
	(Reclaimed with plantation)	*0.00*	*15.00*	*52.98*	*52.98*
5	Undisturbed area	437.61	304.04	239.25	239.25
	(Brought under plantation)	*51.00*	*100.00*	*150.00*	*172.00*
6	Roads	15.00	20.00	20.00	20.00
	(Avenue plantation)	*5.00*	*5.00*	*5.00*	*5.00*
7	Embankment	32.72	37.80	37.80	37.80
	(Avenue plantation)	*6.60*	*7.60*	*10.00*	*10.00*
8	Area around buildings and Infrastructures	59.52	59.52	59.52	59.52
	(Plantation around Infrastructure)	*5.00*	*10.00*	*20.00*	*20.00*
9	Outside ML Area	16.60	16.60	16.60	16.60
	(plantation)	*1.00*	*1.00*	*1.00*	*1.00*
	Total Land (ha)	**1120.48**	**1120.48**	**1120.48**	**1120.48**
	(Total plantation)	***190.15***	***286.90***	***516.02***	***686.41***

Stage-wise plantation details are provided below:

Year	External Dump (OB+Top Soil)		Backfilled area		Others (undisturbed area/etc.)		Total	
	Area (ha)	No. of trees (2500/ha)	Area (ha)	No. of trees (2500/ha)	Area (ha)	No. of trees (2500/ha)	Area (ha)	No. of trees (2500/ha)
1st year	100.80	252000	20.75	51875	68.60	171500	**190.15**	475375
5th year	125.80	314500	37.50	93750	123.60	309000	**286.90**	717250
End of Mine life 11th year	202.520	506300	127.50	318750	186.00	465000	**516.02**	1290050
Post Mining	202.520	506300	275.89	689725	208.00	520000	**686.41**	1716025

From the above tables it can be concluded that 686.41 ha land area will planted till end of mine in this project. It will be more than 61 % of the total ML area. Thus total plantation will be much higher than the minimum 33% plantation requirement.

16.7.5 Flora & Fauna Conservation

The baseline data for flora and fauna has been conducted in March, 2021 within the core and buffer zone of the project. As reported in the baseline, Tadoba Andhari Tiger reserve is at a distance of approx. 19 km in North East of the lease area. A tiger corridor passes at a distance of approximately 15.5 Km from the study area in the East.

Following are Schedule I/ Endangered Species in the study area

Name			WPA, 1972 Status	IUCN Status
Scientific	English	Common / Hindi		
Mammal				
Cuon alpinus	Wild dog	jungli kutta	II	EN
Melursus ursinus	Sloth bear	Bhalu	I	VU
Panthera Pardus	Leopard	Tendua	I	VU
Panthera tigris	Tiger	Wagh	I	EN
Bird				
Pavo cristatus	Indian peafowl	Morr	I	LC

Wildlife conservation plan was submitted along with the flora & fauna baseline report.

16.7.6 Socio-Economic Issues

The open cast mining in the area has been continued for previous three decades. Many locals has been provided direct employment in compensation to the land by WCL. The local economy is depended on the mining. Various CSR activities as desired by the local people for the development are carried out. This proposal will continue the mining operations in Sasti OC. Thus provide project proponent necessary resources for continued CSR activities.

16.7.7 R & R of PAFs

The proposed expansion will not require any rehabilitation and resettlement of village. The land loosers will be suitably compensated as per R&R policy of Coal India Limited. In absence of data, 1 no. of project affected family (PAF) per acre of tenancy land has been considered in this report and thus total no. of PAFs works out to 525 (212.54 x 2.47).

16.8 CSR

WCL takes up various infrastructural development works in the surrounding area covering the needs of the local community and the various works undertaken under CSR activities for community development. Following measures will be continued to be taken up by WCL for the community development under the CSR programme:

- Development of road thereby improving the communication.
- Improvement in Power, Telephone (including Mobile) facility.
- Improvement in Health Care facility & Educational facility.
- Improvement in Market / Trade & Business.
- The social infrastructure by way of cultural mixing of people of other states with local community glorifying “UNITY IN DIVERSITY”.
- Company provide employment to land losers as per its R& R Policy which will certainly change the quality of life of land losers.

The inflow to be spend for the land acquisition activities will boost the economy of the area. This will spurge the growth in secondary market also.

16.9 ENVIRONMENT MANAGEMENT STRUCTURE

To have a close watch on the environmental condition and implementation of the various measures suggested, a multi- disciplinary approach is essential. At present WCL headquarter acts as apex body which supervises the activities relating to environment at project level through the General Manager. General Manager of the area coordinates the activities of various disciplines in the area to render all necessary assistance at the implementing level i.e. the project. Area Nodal Officer (Environment) monitors all aspects of environment on behalf of the General Manager. He also takes suitable steps for generation of environment data along with its analysis and interpretations. Plantation activities are carried out through the state forest departments. Sub-Area Manager is responsible for mechanical reclamation of the area. He is also responsible for biological reclamation with the assistance of GM’s office.

16.10 EQUIPMENT FOR POLLUTION MITIGATION

In order to mitigate the pollution generated due to opencast coal mining, various state of art pollution control equipment's are being proposed in this project report. Mobile/static Fogging machines are proposed to be installed to supress the dust along the coal transportation route and haul road. Fixed water sprinklers are proposed along the coal transportation route and haul road for dust suppression. Continuous ambient air quality monitoring station for various air quality parameters is proposed to be installed. Piezometers with telemetry are proposed for monitoring of ground water level. Sewage treatment plant, effluent treatment plant and sedimentation tank of suitable capacity are proposed to be upgraded/ installed for the water pollution control.

16.11 COST OF ENVIRONMENTAL MEASURES

A capital provision of Rs. 777.51 lakh is made for the environment protection measures. The total capital for environment protection measures is same as the approved Project Report, 2020.

Sl. No.	Particulars	Amount (Rs. Lakhs)
1	Sedimentation Pond upgradation for Treatment of Mine Waste water	25
2	Effluent Treatment Plant modification for treatment of Workshop Effluent	25
3	Base Line Environment Data Generation	15
4	Fogging machines for Dust control measures.	60
5	Digital Mapping for Land Use Plan	15
6	Continuous Ambient Air Quality Monitoring Station(CAQMS)	75
7	Sewarage Treatment Plant	75
8	Installation of fixed type sprinklers on haul roads, transportation of coal route, CHP loading & unloading points and other dust generation sources etc.	80

Sl. No.	Particulars	Amount (Rs. Lakhs)
9	10-30m of three tier plantation for green belt along mine boundary for approx 14.00 km to control air pollution	70
10	Health check-up for Occupational diseases as per EC Condition	30
11	Scientific Studies	15
12	Installation of Piezometers with telemetry	25
13	Fund for Wild Life Conservation	100
14	Provision for Compliance of issue raised during Public Hearing etc	100
15	Misc. Provisions for fulfillment of statutory requirements under environment clearance, CTE, CTO, ground water clearance or as per directives of SPCB/MoEF&CC.	67.51
	Total	**777.51**

17.1 LAND REQUIREMENT

Total land acquired of existing Sasti OC mine is 919.64 ha. It was proposed in the Approved PR of Sasti Expansion OCM (2.50Mty), June 2020 to extend the mine in western side upto Fault F_8-F_8 & in the dip side upto 200m depth which will require additional 228.84 ha land (including around 9.00 ha of Govt land of Sakhari nala and Gauri Nala to maintain a common mine boundary between Sasti OC mine and Dhuptala OC mine). In the approved PR of Dhuptala OC mine (Sasti UG to OC mine), around 39.70 ha land was proposed to be transferred to Dhuptala OC mine from Sasti OC mine. In the approved PR of Sasti OC mine 11.70 ha land was proposed to be transferred from Dhuptala OC mine to Sasti OC mine. Hence total area within the mine boundary of the approved Sasti Expansion OC mine was 1120.48 ha (919.64 - 39.70 + 11.70 + 228.84). The land requirement has been kept same in this Mining Plan.

17.2 LAND DETAILS

The details of land already acquired as well as land proposed for acquisition in the PR of Sasti Expansion OC mine are given below :

Sl. No.	Land Type	Land already acquired in Sasti OC mine	Proposed to be transferred to Dhuptala OC mine (As per approved PR of Dhuptala OCM)	Proposed to be transferred From Dhuptala OC mine (In this expansion PR of Sasti OCM)	Additional Land acquisition proposed in Sasti Expn. OC mine	Total Land (ha)
1	Tenancy Land	899.44	37.70	11.70	212.54	1085.98
2	Govt. Land	20.20	2.00	-	16.30	34.50
3	Forest Land	-	-	-	-	-
	Total	**919.64**	**39.70**	**11.70**	**228.84**	**1120.48**

Thus, the total land involved in proposed expansion mine is 1120.48 ha, out of which 228.84 ha land (212.54 ha tenancy land and 16.30 ha government land) and the land acquisition is under process as per the Approved PR of Sasti Expansion OC mine. The land required for the project belongs to surrounding villages namely Mathara etc.

Note : The govt and tenancy land records of the proposed mine area have not been provided by mine management and the above land details are mainly on the basis of KML file with reference to revenue plan provided by Ballarpur Area. This may vary with the actual land measures as per the govt. land records.

17.3 REHABILITATION & RESETTLEMENT

No rehabilitation of any village is involved in this project.

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17.4 LAND USE OF THE PROJECT

Total 1120.48 ha land is involved for the proposed Sasti Expansion OC mine. The land use of the project is as follows:

Sl. No.	Particulars	Area (ha)
1	Entire Quarry Area	544.79
2	External OB dump	202.52
3	Infrastructure including Railway Siding and Road	79.52
4	Embankment	37.80
5	Area needed for rationalization including safety and blasting zone	239.25
6	Outside ML area (Existing Railway Line)	16.60
	Total Land	**1120.48**

18.1 MINE CLOSURE PLANNING

For the Mine Closure activities, a corpus fund is created by opening an escrow account with the coal controller organization in nationalised bank. For opencast mine, an amount @ Rs 9.00 lakhs per Ha of the project area is required to be deposited in this escrow account for final mine closure after adjustment for WPI on the date of computation. This mine closure corpus is divided by the life of mine to calculate yearly mine closure contribution. This amount is deposited in the escrow account every year after escalating @ 5% per annum.

The Mine Closure Plan of existing Sasti OC mine was approved by WCL Board in 240th meeting held on 25 August, 2012 for total land area of 919.69 ha and total mine life of 12 years starting from 2011-12. The annual corpus amount estimated for the year 2011-12 was Rs. 564.16 lakhs.

The total amount deposited in the Escrow A/c against Mine Closure for existing Sasti Expansion OC mine upto 31.03.2022 is tabulated below :

S.No.	Financial Year	Provision in Approved MCP (Rs. Lakh)	Amount Deposited in Escrow Account (Rs. Lakh)
1	2011-12	564.16	0
2	2012-13	592.37	0
3	2013-14	621.99	1735.07
4	2014-15	653.09	696.54
5	2015-16	685.74	685.74
6	2016-17	720.03	720.03
7	2017-18	756.03	756.03
8	2018-19	793.83	793.83
9	2019-20	833.52	833.52
10	2020-21	875.20	875.20
11	2021-22	918.96	918.96
	Total	**8014.92**	**8014.92**

The reserves of existing Sasti Expansion OC mine have almost exhausted in 2021-22 and thereafter production from proposed Sasti Expansion OC mine will continue from 2022-23 onwards. The production will start from 1st year (2022-23) and will continue upto 11th year. In this Mining Plan, the total corpus of closure cost has been worked out for 1103.88 ha (Excluding 16.60 ha land outside ML area of Railway track for evacuation i.e.1120.48 -16.60=1103.88 ha) land including land of existing Sasti Expansion OC mine and balance production life of 11 years as on 01.04.2022 after making adjustment for the corpus fund already deposited / to be deposited in the Escrow account of existing Sasti Expansion OC mine during the period from 2011-12 to 2021-22.

The detailed calculation of the corpus fund as well as annual corpus amount for the proposed Sasti Expansion OC mine has been worked out and the details are tabulated below.

Sl. No.	Details	Qty.
1	WPI for All Commodities for April 2019 (New Series)	121.1
2	WPI for All Commodities for April 2022 (Final)	152.3
3	Ratio of WPI = (2) / (1)	1.2576383
4	Total land area considered for Mine Closure (Excluding 16.60 ha land outside ML area of Railway track for evacuation i.e. 1120.48 - 16.60 = 1103.88 ha)	1103.88
5	Mine closure cost @ Rs 9 lakhs/ha (Rs in Lakhs)	9934.92
6	Mine closure cost after indexing (Rs. In Lakhs) = (5) x (3)	12494.54
7	Amount deposited / to be deposited by existing Sasti Expansion OC mine up to 31.03.2022 (Rs in Lakhs)	8014.92
8	Balance Mine Closure Corpus to be deposited in Sasti OC mine from 2022-23 onwards (Rs. Lakhs) = (6) – (7)	4479.62
9	Production Life of proposed Sasti Expansion OC mine	11
10	Net Annual Mine closure amount to be deposited for 11 years (Rs. In Lakhs) = (8) / (9)	407.24

The annual Mine Closure Cost to be deposited in the proposed Mining Plan of Sasti Expansion OC mine is tabulated below:

Year		Annual Production (Mty)	Corpus Fund (Rs. in Lakhs)	Mine Closure Cost (Rs /t)
1	2022-23	1.80	407.24	22.62
2	2023-24	2.00	427.60	21.38
3	2024-25	2.20	448.98	20.41
4	2025-26	2.50	471.43	18.86
5	2026-27	2.50	495.00	19.80
6	2027-28	2.50	519.75	20.79

Year		Annual Production (Mty)	Corpus Fund (Rs. in Lakhs)	Mine Closure Cost (Rs /t)
7	2028-29	2.50	545.74	21.83
8	2029-30	2.50	573.03	22.92
9	2030-31	2.50	601.68	24.07
10	2031-32	2.50	631.76	25.27
11	2032-33	0.62	663.35	106.99
Total		**24.12**	**5785.56**	**23.99**

18.6 IMPLEMENTATION OF MINE CLOSURE PLAN

1) Mine Closure Plans will have following two components :

   i) Progressive or Concurrent Mine Closure Plan
   ii) Final Mine Closure Plan

   Progressive Mine Closure Plan would include various land use activities to be done continuously and sequentially during the entire period of the mining operations. The Final Mine Closure activities would start towards the end of mine life and may continue even after the reserves are exhausted and/or mining is discontinued till the mining area is restored to an acceptable level.

2) Progressive Mine Closure Plan shall be prepared for a period of every five years from the beginning of the mining operations. These plans would be examined periodically in every five years period and to be subjected to third party monitoring by the agencies approved by the Central Govt. Various project specific activities like mined out land details & their technical and biological restoration plan, water quality management, infrastructure to be retained and demolished, disposal of mining machinery etc. shall be furnished in the relevant paras. Where the backfilling of the mine void is being carried out as part of the regular mining operation, it shall not be included in the list of progressive mine closure activities. However, in case, where the backfilling of mine void is to be carried out specifically for closure of mine, quantum of such OB and the mine closure fund earmarked for the purpose must be included in the list of activities to be taken up for mine closure in the Mining Plan.

a) Mining is to be carried out in a phased manner i.e. continuation of mining activities from one phase to other indicating the sequence of operations depending on the geo-mining conditions of the mine. Upto 50% of the total deposited amount including interest accrued in the Escrow Account may be released after every five years in line with the periodic examination of the Closure Plan. The amount released should be equal to expenditure incurred on the progressive mine closure in past five years or 50% whichever is less. The balance amount shall be released to mine owner/ leaseholder at the end of the final Mine Closure on compliance of all provisions of Closure Plan.

4) Mine Closure Activities (Abandonment Activities)

The mine closure activities involving progressive and final mine closure shall include barbed wire fencing all around the working area, dismantling of structure / demolition and cleaning of sites, rehabilitation of mining machinery, plantation, physical / biological reclamation, landscaping, biological reclamation of left out overburden dump, filling of decoaled void, post environment monitoring, supervision charges, power cost, protective and rehabilitation measures including their maintenance and monitoring, miscellaneous charges etc. for the specified post closure period.

The different mine closure activities and cost distribution for Progressive and Final Mine Closure are tabulated below :

Activity wise Break-up of Closure Cost

Total Corpus Fund = Rs. 8014.92 lakhs (upto 2021-22) + Rs. 5785.56 lakhs
= **Rs. 13800.48 lakhs**

Sl. No.	Activity	Weighted % of Mine Closure Cost			Mine Closure Amount (Rs. in Lakhs)
		Progre-ssive	Final	Average	
A	**Dismantling of structure**	0.00	8.50	4.25	586.52
	Service Building				
	Residential Building				
	Industrial Structure				

Sl. No.	Activity	Weighted % of Mine Closure Cost			Mine Closure Amount (Rs. in Lakhs)
		Progre-ssive	Final	Average	
B	**Safety & Security**				
	Random rubble mansory/concrete wall	6.50	3.20	4.85	669.32
	Toe wall around dump/Gabbion wall				
	Barbed wire fencing				
	Fencing/Boundary wall, fencing around water body				
	Garland Drains				
C	**OB Dumping Reclamation**				
C.1	**Technical Reclamation**	60.50	60.50	60.50	8349.29
	Re-handling of OB				
	Levelling by Dozer				
	Grading				
	Levelling and Grading of highwall slopes and OB Dump				
C.2	**Biological Reclamation & Plantation**	15.00	11.70	13.35	1842.36
	Top Soil Management				
	Grassing of OB Dump				
	Plantation around virgin area, safety zone, green belt over external dump and internal reclamation area				
	Plantation post care (incl. manpower)				
	Plantation over cleared area obtained after dismantling				
D	Landscaping of the open space in leasehold area for improving its esthetic. Drain, pipe lines, peripheral road, gates, View points, cemented steps on bank	4.00	5.50	4.75	655.52
	Development of Agriculture Land				
E	**Environment Mitigation and Manpower**	12.00	1.50	6.75	931.53
	Air Quality (Water tanker, Sprinkler & Other control measures.)				
	Water Quality (ETP & STP etc operating cost)				
	Manpower cost and Supervision				

Sl. No.	Activity	Weighted % of Mine Closure Cost			Mine Closure Amount (Rs. in Lakhs)
		Progre-ssive	Final	Average	
F	**Post Closure Monitoring**	0.00	3.20	1.60	220.81
	Air Quality				
	Water Quality				
	Power Cost				
	Manpower cost and supervision				
G	Enterpreneurship Development (Vocational/Skill development training for sustainable income of affected people)	1.00	0.50	0.75	103.50
H	Miscellaneous & Other measures like Golden Handshake, one time financial grant, alternative jobs, other services etc.	1.00	5.40	3.20	441.62
	TOTAL	**100**	**100**	**100**	**13800.48**

19.0 MANPOWER

The PR (June 2020) was approved in Total Hiring Option. The manpower requirement for Sasti OC mine has been calculated on the basis of 3 shift operation for 330 days in a year. The manpower to be deployed in the proposed project for Total hiring option is 358.

Manpower Requirement (Total Hiring Option)

Sl. No.	Particulars	Strength (Nos.)
1.	Executives	33
2.	Non-executives:	
i)	Monthly rated staff	134
ii)	Daily rated staff	191
3.	**Total**	**358**

In addition to above, 30 Nos. of manpower for security was provided on hiring basis. The existing manpower of Sasti OC mine as on 01.04.2022 is 737 (Executives : 37 & Non-Executives :700).

In addition to this, total employment likely to be generated in acquisition of 212.54 ha additional tenancy land in proposed Sasti Expansion OC mine works out to 263 @ 1 job per 2 acre land. Thus, total existing manpower in Sasti Expansion OC mine including manpower generated due to land acquisition as on 01.04.2022 will be 1000 (737 + 263).

The manpower requirement as per the Approved PR of Sasti Expansion OC mine in Total Hiring option and surplus / deficit of manpower are tabulated below :

Sl. No.	Particulars	Total Hiring Option
1.	Manpower Requirement (Approved PR June 2020)	358
2	Existing manpower as on 01.04.2022	737
3	Manpower Generated due to land acquisition @ 1 job per 2 acre land	263
4	Total manpower available (2+3)	1000
5	Surplus (+) / Deficit (-) (4 - 1) as on 01.04.2022	(+) 642

From above, it is clear that there will be 642 surplus manpower in Total Hiring Option which will be shifted to other mines of WCL for gainful utilization.

20.0 CONCLUSION

Sasti Expansion OC mine is an existing project in Ballarpur Area of WCL. The Environmental Clearance was granted by MoEF & CC vide ref no. J-11015/435/2006-IA.II (M) for 2.50 Mty capacity in May, 2007. The latest PR for Sasti Expansion OCM, 2.50 Mty (June, 2020) was approved in 324th meeting of WCL Board held on 04.08.2020 in Total hiring option with departmental Dragline in operation. The application for obtaining ToR was submitted to MoEF&CC in December, 2020. The ToR was issued by MoEF&CC vide No.J-11015/435/2006-IA.II(M) dated 02/01/2021.

As already detailed earlier, this Mining Plan (July 2022) proposes the following amendments as desired by WCL in the Approved PR June 2020 :

1. Change in Technology
    a) Survey-off of 20/90 Departmental Dragline
    b) Deployment of Surface Miner for Coal Cutting

2. Diversion of Gauri Nala & Widening of Sakhari Nala

Considering the above changes in this Mining Plan, the environment clearance is proposed to be obtained for production capacity of 2.50 MTPA with increasing EC ML area from existing 919.69 ha to proposed 1120.48 ha.

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SASTI EXPANSION OPEN CAST MINE

Ref.No.: WCL/BA/SSA/SEOCM/2025/ 1222 Date- 16.06.2025. 19

ILLUMINATION SURVEY REPORT

Date of Survey 16.06.2025

SN	Place/Area to be illuminated	Illumination Standards (in Lux)	Actually provided (in Lux)
1	Workplace of HEMM Near BE1000 -PC 233, BO Face Near Shovel 571	15 H, 25 V	13 H, 18 V 12 H, 15 V
2	Drills IDM - 70 , 803	15 H (Near Drill Hole) 25 V (drilling Full Height)	16 H, 12 V
3	Haul Road		
	Coal Face to coal Stock	10 H	7 H
	OB face to OB dump yard(Middle Bench)	10 H	7 H
4	New CHP feeding Point	42 H	32 H
5	HEMM Workshop	100 H	92 H
	Dumper Shed	100 H & 50 V	90 H & 45 V
	Excavator Shed	100 H & 50 V	95 H & 45 V
6	Pump station B-2	40 H, 30 V	40 H, 32 V
7	Operators cabin of TATA 1200-2009	50 H	45 H

WI Electrical/ Electrical Foreman
Sasti Exp. OCM

Colliery Engineer (E&M)
Sasti Exp. OCM

16/6/25
Mine Manager
Sasti Exp. OCM

Illumination

Scanned with OKEN Scanner

OFFICE OF THE MINE MANAGER
SASTI EXPANSION OPEN CAST MINE

Ref.No.: WCL/BA/SSA/SOCM/Safety/2025/ 42 Date- 25.08.2025

ILLUMINATION SURVEY REPORT FOR THE MONTH AUGUST-2025

Date of Survey 16.08.2025

SN	Place/Area to be illuminated		Illumination Standards (in LUX)	Actually provided (in LUX)
1	Workplace of HEMM	TATA 1200 at B4 OB Bench	15 H, 25 V	15 H, 25 V
		PC BEML 10151		15 H, 25 V
		HOE Coal Face Excavation Area		18 H, 25 V
2	Drill Operation	B4 Face Area (Drill IDM – 70/803)	15 H (Near drill hole), 25 V (Drilling full height)	15.5 H, 25 V
3	OB Dump	HOE Top Dump	15 H & 15 V	14.8 H ,16 V
		HOE RC Dump		16 H, 15 V
		Departmental Dump		15 H, 14.8 V
	Coal Stock	Main Entry Point to 24 No's Coal stock & HOE Junction Tower	15 H & 15 V	19 H, 20V
4	Operator cabin	Operator cabin of TATA 1200	50 H	55 H
		Operator cabin of PC Liugong		53 H
5	Haul Road	HOE Top Benches to Dump	10 H	11H
		Coal Stock to 1st Junction		10 H
6	CHP	New CHP feeding Point	40 H	43 H
		New CHP Operation Point	50 H	50H
7	Pumping Station	B 2 Pump	40 H	45 H
		HOE Pump		42 H
8	Sub-station	66 KV Electrical Sub-station	100 H, 50 V	100 H, 51 V
9	Rest Shelter	Coal Face	30 H	30 H
		B4 OB Face		30 H
10	Workshop	Deptt. HEMM Workshop	100 H, 50 V	102 H, 52 V
11	Parking Yard	RC Dumper Parking yard	50 H	50 H

25-8-25

WI Electrical/ Electrical FM
Sasti Exp. OCM

Colliery Engineer (E&M)
Sasti Exp. OCM

Mine Manager
Sasti Exp. OCM

Compliance to OM - No. Z-11013/57/2014-IA.II (M) dated: 29.10.2014

Sr no	Conditions	Compliance Status
1	The Project Authority shall adopt Best Mining Practice for the given mining conditions. In the mining area, adequate number of check dams, retaining walls/structures, garland drains and settling ponds should be provided to arrest the wash-off with rain water in catchment area.	Mining is being done as per approved mining plan and no deviation shall be done before obtaining necessary prior approval form MoEF&CC. Settling / sedimentation pond of appropriate size has been constructed to treat the industrial(Mine activity area) effluent including water pumped out from mine considering peak discharge. The water so treated is being used within the mine premises for dust suppression, watering of plantation, Industrial use, fire fighting.. Garland drains of appropriate different sizes of 3.00x2.00, 2.00x1.5, & 1.5.x1.00mtr. for a total length of 12235.00mtr.have been provided along the periphery of excavated area as well as OBD. Desilting is being done every year before onset of monsoon. Further construction of Garland drains will be taken up as per requirement of mine with due regards to safety
2	The natural water bodies and or streams which are flowing in and around the village should not be disturbed. The Water Table should be nurtured so as not to go down below the pre-mining period. In case of any water scarcity in the area, the Project Authorities have to provide water to the villagers for their use. A provision for regular monitoring of water table in open dug well located in village should be incorporated to ascertain the impact of mining over ground water table	No nallah or River diversion shall be made without carrying out studied and approvals from competent authorities of State Government. Ground water, excluding mine water, is not be used for mining operations. Rainwater harvesting have been implemented for conservation and augmentation of ground water resources at various office buildings in Ballarpur Area. Water is being supplied to nearby villages through tankers during dry season to cater to their water requirement. Regular monitoring of groundwater level and quality is being carried out in and around the mine lease area by establishing a network of existing wells and constructing new piezometers during the mining operations. The monitoring of ground water levels is carried out four times a year i.e. pre-monsoon, monsoon, post-monsoon and winter. The ground water quality is monitored once a year, and the data thus collected is sent regularly

		to MOEFCC/RO on half yearly basis.
3	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. The Project Proponents (PPs) must ensure that the biological clock of the villagers is not disturbed by orienting the floodlights/ masks away from the villages and keeping the noise levels well within the prescribed limits for day/night hours.	Adequate illumination is ensured in all mine locations (as per DGMS standards) and monitored on a weekly basis such that it does not disturb the surrounding villages or habitation. Regular monitoring through CMPDIL is being done on fortnightly basis and the results are within limits, Workers exposed to high noise level are provided with ear plugs/muffs. HEMM are properly maintained and kept in good condition. Noise proof cabins of HEMM are also provided. Sound level meter is used for measuring noise levels at work place and records are maintained.
4	The Project Authority shall make necessary alternative arrangements, where required, in consultation with the State Government to provide alternate areas for livestock grazing. In this context, Project Authority should implement the directions of the Hon'ble Supreme Court with regard to acquiring grazing land. The sparse trees on such grazing ground, which provide midday shelter from the scorching sun should be scrupulously guarded against felling, lest the cattle abandon the grazing ground or return home by noon.	No grazing land involved.
5	Where ever blasting is undertaken as part of mining activity, the Project Authority shall carry out vibration studies well before approaching any such habitats or other buildings to evaluate the zone of influence and impact of blasting on the neighbourhood. Within 500 meters of such sites vulnerable to blasting vibrations, avoidance of use of explosives and adoption of alternative means of mineral extraction, such as ripper/dozer combination/rock breakers/ surface miners etc. should be seriously considered and practiced wherever practicable. A provision for monitoring of each blast should be made so that the impact of blasting on nearby habitation and dwelling units could be ascertained. The covenant of lease deed under Rule 31 of MCR 1960 provides that no mining operations shall be carried out within 50 meters of public works such as public roads and buildings or inhabited sites except with the prior permission from the Competent Authority.	Blasting is done as per Scientific Blasting study in order to mitigate ground vibrations, fly rocks, noise and air blast etc., as per the guidelines prescribed by the DGMS. No habitat lies within the mine leasehold area.
6	Main haulage road in the mine should be provided with permanent water sprinklers and other roads should be regularly wetted with water tankers fitted with sprinklers. Crusher and material transfer points should invariably be provided with Bag filters and or dry fogging system. Belt conveyors should be fully covered to avoid air borne dust.	Adequate Fixed type water sprinklers are provided in &around C.H.P. WeighBridges, coal transport roads, transfer points etc. as per direction of M.P.C.B., Chandrapur. They are being properly maintained & operated. Details of Air pollution Control measures are given as

		below :- . Fixed sprinklers are provided at 100 MT weighbridge- 08 Nos. 1. Fixed sprinklers are provided at Main CHP - 06 Nos. 2. AlongCoaltransportationroad–04nos 3. Concrete pavement provided at coal unloading Area and loading point at mini CHP. 4. Brooming and maintenance of coal transport road and weigh bridge road is done regularly. 5. Spraying of water by 5 Nos. of Mobile Water Tankers (Hired-1 nos. Of 4 KL, Departmental – 2nos. of 28 KL each and HOE contractor – 2 nos. Of 28 KL each) 6. Concrete pavement is provided in w/s complex. 7. Coal carrying Trucks are covered with Tarpaulin. 8. Tarring of 06.00 km length of internal roads used by Coal Transportation trucks. 9. One no. of trolley mounted fogger has been commissioned at Sasti OC mine with a throw of 100m. 10. Further 3 nos. are to commissioned in July 2025. 11. Tyre wash system has been installed.
7	The Project Authority shall ensure that the productivity of agricultural crops is not affected due to mining operations. Crop Liability Insurance Policy has to be taken by the PP as a precaution to compensate for any crop loss. The impact zone shall be 5km from the boundary of mine lease area for such insurance policy. In case, several mines are located in a cluster, the Associations of owners of the cluster mines, formed inter-alia, to sub-serve such an objective, shall take responsibility for securing such Crop Liability Policy.	No such crop damage has been reported in the impact zone of mine. All necessary arrangements are made so that the productivity of agricultural crops is not affected due to mining operations.
8	In case any village is located within the mining leasehold which is not likely to be affected due to mining activities during the life of mine, the Expert Appraisal Committee (EAC) should consider the proposal of Environmental Clearance (EC) for reduced mining area. The Mining lease may be executed for the area for which EC is accorded. The mining plan may also be accordingly revised and required	NO villages are located mining leasehold.

<table>
<tr><td></td><td>stipulations under the MMDR Act, 1957 and MCR, 1960 met.</td><td></td></tr>
<tr><td>9</td><td>Transportation of the minerals by road passing through the village shall not be allowed. A ‘bypass’ road should be constructed (say, leaving a gap of at least 200 meters) for the purpose of transportation of the minerals so that the impact of sound, dust and accidents could be mitigated. The PP shall bear the cost towards the widening and strengthening of existing public road network in case the same is proposed to be used for the Project. No road movement should be allowed on existing village road network without appropriately increasing the carrying capacity of such roads</td><td>No transportation of minerals takes place through village roads.</td></tr>
<tr><td>10</td><td>Likewise, alteration or re-routing of foot paths, pagdandies, cart roads, and village infrastructure/public utilities or roads (for purposes of land acquisition for mining) shall be avoided to the extent possible and in case such acquisition is inevitable, alternative arrangements shall be made first and then only the area acquired. In these types of cases, Inspection Reports by site visit by experts may be insisted upon which should be done through reputed Institutes.</td><td>No road diversion shall be made without carrying out studied and approvals from competent authorities of State Government.</td></tr>
<tr><td>11</td><td>As CSR activities by Companies including the Mining Establishments has become mandatory up to 2% of their financial turn-over, Socio Economic Development of the neighborhood Habitats could also be planned and executed by the PPs more systematically based on the ‘Need Page 3 of 3 based door to door survey’ by established Social Institutes/Workers on the lines as required under TOR. “R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village located in the mine lease area will be shifted or not. The issues relating to shifting of Village including their R&R and socio-economic aspects should be discussed in the EIA report.”</td><td>There is no village within the mine lease area. In case of villages around mine lease CSR expenditure is as follow:

<table><tr><td>Sr no.</td><td>Year</td><td>Expenditure (lakhs)</td></tr><tr><td>1</td><td>2019-20</td><td>237.35</td></tr><tr><td>2</td><td>2020-21</td><td>47.05</td></tr><tr><td>3</td><td>2021-22</td><td>2.17</td></tr><tr><td>4</td><td>2022-23</td><td>25.52</td></tr><tr><td>5</td><td>2023-24</td><td>60.3</td></tr><tr><td>6</td><td>2024-25</td><td>379.35</td></tr></table></td></tr>
</table>

COAL INDIA LIMITED

CORPORATE ENVIRONMENT POLICY

2023

Back Ground:

Coal India Limited subscribes to the view of Sustainable Development. Unless the environment can sustain all the developmental activities, any pursuit of development in isolation can cause irreparable damage to the ecosystem and associated environmental attributes. Keeping this view in mind, Coal India Limited attaches top priority towards sustainable development and approved its 'Corporate Environmental Policy' in December 1995, which was subsequently revised in 2012 and 2018. The present policy is the revision of the Corporate Environment Policy 2018 and is complimentary to the National Environmental Policy, 2006.

This modification in the present policy is the outcome of the experience gained since 2018 keeping in view the modifications / amendments made time to time in environmental policies and additional stipulations notified by MoEF&CC (Ministry ofEnvironment, Forest& Climate Change) and other organizations concerning mine closure, reclamation of degraded land, environmental clearance etc. and also with the objective of revisiting the corporate policy. Government of India is signatory to few international conventions/agreements relevant to CIL amongst others and activities associated with such conventions/agreements are embodied in the present policy

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

Policy Statement:

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

Objectives:

CIL shall endeavor to-

1. *Plan & design projects with due consideration to environmental and social concerns for Sustainable Development and reduction in emission intensity of its operations.*

2. *Conduct mining and associated operation in an environmentally responsible manner to comply with applicable laws and other requirements related to environmental aspects.*
3. *Prevent pollution in surrounding habitation by continuous monitoring and adopting suitable measures for environment protection.*
4. *Ensure effective implementation of Environment Management Plans (EMPs) in all our mines / projects to mitigate pollution, conservation of natural resources and restoration of ecology& biodiversity.*
5. *Ensure compliance of all statutory conditions prescribed by regulatory agencies.*
6. *Ensure waste management in each unit on the principle of REDUCE, REUSE, RECYCLE and SAFE DISPOSAL.*
7. *Put special thrusts on efficient energy utilization / renewable energy and other measuresto reduce carbon foot-print.*
8. *Strive for continual improvement in our environmental performances by setting targets, measuring progress and taking corrective action.*
9. *Take measures to gainful repurposing of land and render productive post mining land use for ensuring environmentally sustainable and socially acceptable closure of mine.*
10. *Ensure implementation of activities applicable to CIL arising out of InternationalConventions.*
11. *Create environmental awareness and ensure environmental education among the employees, local communities and other stakeholders through pro-active communication and training.*
12. *Promote R&D projects/innovations addressing various environmental concerns like minimization of carbon footprints of CIL and environmental issues in mining & surrounding areas.*
13. *Ensure transparency in Environmental reporting / disclosure to stakeholders.*

Review of Environmental Policy:

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