

Letter No. OCPL/ 716
Date: 22-11-2021



Odisha Coal and Power Limited
(A Government of Odisha Company)
CIN: U10100OR2015SGC018623
Website: www.ocpl.org.in

To,

The Joint Director(s)
Regional Office, Eastern Region (ERO)
Ministry of Environment, Forest & Climate Change
A-3, Chandrasekharapur, Bhubaneswar-751023

Sub: Submission of Half Yearly Compliance Report of the Environmental Clearance conditions of Manoharpur Open Cast Coal Mine Project (8.00 MTPA) of Odisha Coal & Power Limited located in IB valley, Dist. Sundargarh, Odisha.

Ref: (i) EC letter No. J-11015/139/2008-IA.II (M) dated 21.02.2014
(ii) EC transfer order vide letter no. J-11015/139/2008-IA.II (M)Pt. file dt. 30.12.2015
(iii) Amendment in EC vide letter no. J-11015/139/2008-IA.II (M)Pt. dt. 06.11.2019

Dear Sir,

In reference to the notification issued by MoEF&CC vide letter S.O. 5845 (E) dated 26.11.2018 and Environmental Clearance as referred above in respect of Manoharpur Open Cast Coal Mine (8.00 MTPA) of Odisha Coal & Power Limited located in IB valley, Dist. Sundargarh, Odisha, please find enclosed herewith Half Yearly Compliance Report in soft copy (by email) as well as hard copy for the period of April 2021 to September 2021.

As per MoEF&CC (ERO) letter dated 11.05.2020, the scanned copy of report is being submitted to their good office at the given email address (roez.bsr-mef@nic.in).

This is for your kind information and needful action at your end.

Yours Faithfully

Agent
(Manoharpur Coal Mine Project)

Copy to:

1. The Scientist ('E' & Regional Directorate), Central Pollution Control Board, South end Conclave, Block 502, 5th & 6th Floors, 1582 Razidanga Main Road, Kolkata-700107.
2. The Member Secretary, State Pollution Control Board, Odisha, Paribesh Bhawan, A/118, Nilkanthnagar, Unit VIII, Bhubaneswar 751012

HALF YEARLY COMPLIANCE REPORT

For

Environmental Conditions

April 2021 – September 2021

MANOHARPUR OPENCAST COAL MINE



Odisha Coal & Power Limited,
Zone-A, Ground Floor,
Fortune Tower, Bhubaneswar-751023, Odisha
Web: www.ocpl.org.in

ENVIRONMENTAL CLEARANCE(EC) COMPLIANCE REPORT

PROJECT NAME - MANOHARPUR OPENCAST COAL MINE PROJECT

EC letter No. J-11015/139/2008-IA.II (M) dated 21.02.2014 and

EC Transfer Order - EC-No. J-11015 / 139/2008-IA.II (M) Pt. file Dated 30TH December 2015
(EC Amendment letter No. EC-No. J-11015 / 139/2008-IA.II (M) Pt. file Dated 06TH November 2019)

Period of Compliance Report – April 2021 to September 2021

Sr. No.	EC Letter Condition	Compliance									
SPECIFIC CONDITIONS											
i.	The maximum production from the mine at any given time shall not exceed the limit as prescribed in the EC.	<p>The rated maximum production capacity of the mine is 8.00MTPA as per the approved Mining Plan (Rev II). Hence, the limit shall not exceed as prescribed in EC.</p> <p>Mine development work were started w.e.f. 01.11.2018 and coal production started from 10.10.2019. Thereafter, due to evacuation constraints, coal dispatch started w.e.f. 14.12.2019 from mine end to Kanika Railway Siding of MCL. The coal production during the last 2 FY (i.e. 2019-20, 2020-21) is as per following:</p> <table><tr><th>Financial (FY)</th><th>Year</th><th>Coal Production</th></tr><tr><td>2019-20</td><td></td><td>1 MT</td></tr><tr><td>2020-21</td><td></td><td>2.001 MT</td></tr></table>	Financial (FY)	Year	Coal Production	2019-20		1 MT	2020-21		2.001 MT
Financial (FY)	Year	Coal Production									
2019-20		1 MT									
2020-21		2.001 MT									
ii.	Environmental clearance to the proposal is subject to obtaining clearance under the wildlife (Protection) Act, 1972 from the Standing Committee of National Board for Wildlife, as applicable	<p>Not Applicable. The proposed Manoharpur coal mine project does not fall within 10km of National park/sanctuary and as such clearance from National Board of Wildlife is not required for the said project.</p> <p>However, the Site Specific Wildlife Conservation Plan of this project has been approved by Principal Chief Conservator of Forests (PCCF-WL) & Chief Wildlife Warden (CWW), Odisha which is under implementation. The details of amount spent on various activities identified in the approved plan is attached herewith as Annexure 1.</p>									
iii.	The OB should be kept in ML area and there should be no OB dumps at the end of mining.	<p>As per the approved Mine Plan & Mine Closure Plan (Revision – II), total 3 nos. of OB dumps will be acquired in non-coal bearing area by OCPL. Major portion of the overburden (86%) will be utilized in back filling.</p>									

		Currently, the generated OB from the mining operation is being stored at External OB dump 1 (NW) and OB dump 3 (SE) as per approved Mining Plan.
iv.	The land for OB dumping should be made ready for original use after mine closure.	Noted
v.	All the sandstone taken out during mining should be utilized for house construction and given free of cost to locals.	OCPL has approached a reputed institute i.e. National Institute of Technology (NIT), Rourkela to conduct the technical study for availability and suitability of utilization of sandstone and the process for appointing the same is under progress.
vi.	Since the mining area is total forest land, the sandstones should not be dumped as OB.	Efforts will be made to comply with the conditions.
vii.	Fly ash dumping is not permitted in mine void.	Presently, Fly ash is not being dumped. If any situation arises which requires fly ash dumping; then proper scientific studies will be carried out and necessary permissions, if required will be obtained from competent authorities prior to dumping.
viii.	The leachability study may be carried out for chromium, arsenic and mercury that may be present in fly ash.	The required leachability study shall be carried out and the test result of same will be submitted to MOEF & CC for obtaining necessary permission before commencement of fly ash disposal, if required, in Manoharpur Coal Mine Project.
ix.	The CSR amount should be Rs.4 crores in initial 3 years, and thereafter it should be Rs 5/T of coal/annum till the end of the life of project with the escalation factor every year coal production.	This is being complied. CSR / peripheral development activities already carried out in the vicinity of the project area. Total expenditure incurred on same till September 2021 is Rs. 5.22 Cr. The year wise expenditure is attached as Annexure 2 for your kind reference.
x.	The CSR activity, which had already been carried out by proponent, be audited by a 3 rd Party. The audit should be carried out by a reputed agency.	Noted. The CSR audit has already been conducted by reputed agency M/s GEOENVITECH (Research and Consultancy Services Pvt. Ltd.) which is empaneled with Govt. of Odisha.
xi.	The proponent shall come back to the Committee for its washery proposal for further consideration.	Noted & will be complied, if applicable.
xii.	Coal transportation from mine to railway siding by conveyor belt and from siding to TPP by MGR through SILO loading of the wagons	Coal transportation from mine to railway siding will be done by conveyor belt and from siding to TPP by MGR

		<p>through SILO loading of the wagons (Rapid Loading System).</p> <p>OCPL would like to mention that earlier commissioning of MGR system was delayed due to land acquisition issue in MCL command area which has been resolved now and the coal is being transported through the siding located inside the project area to captive power plant (i.e. 2 x 660 MW each of OPGC located Ib Thermal Power Station, Banaharpali) via dedicated rail corridor (MGR).</p> <p>Apart from the above, OCPL transporting the coal from mine end to Kanika railway siding of MCL & ACB Siding through road as an interim arrangement and the same is being utilized under the provisions of Allotment Agreement (Clause – 8). An approval/amendment in the EC letter for transporting the coal by road from mine end to Kanika siding was obtained from MoEF&CC vide letter no. J-11015/139/2008-IA-II(M) Pt. dated 06th November 2019. The copy of same has already been submitted to your good office vide letter no. <i>OCPL/16 dated 06.01.2020 (Refer Annexure 2)</i>.</p>
xiii.	The embankment constructed along the river boundary shall be of suitable dimensions and critical patches shall be strengthened by stone pitching on the river front side and stabilized with plantation so as to withstand the peak water flow and prevent mine inundation.	There is no river in and around the project area. One seasonal nalla i.e. Garia Nalla passes through the coal block which will be diverted outside the coal block. Strong embankment, stone pitching will be provided along the diverted nalla to withstand the peak water flow and prevent mine inundation.
xiv.	There shall be no overflow of OB into the river and into the agricultural fields and massive plantation of native species shall be taken up in the area between the river and the project.	<p>As mentioned above, there is no river in the vicinity of project site except seasonal Garia Nalla. There is no overflow of OB into agricultural fields & Nalla.</p> <p>Plantation of approx. 8534 nos. of trees comprises local native species have been carried out till the FY 2021-22 in and around the mine area by protecting the existing trees inside the project area i.e. safety zone etc. The area covered under plantation is about 19.985 Hac.</p>

		<p>The list of plantation carried out during the FY 2019-20; 2020-21 and 2021-22 is attached herewith as Annexure 3 for your kind consideration. Also, the grass plantation was carried out on slope of the dump to stabilize the dump slope which will control/reduce the chance of overflow of OB.</p> <p>In addition to above also, approx. 18008 nos. of native plant species have been planted in surrounding areas i.e. R&R Colony (Phase 1 & 2) developed by OCPL covering an area of about 4 Hac.</p>
xv.	OB shall be stacked at two earmarked external OB dumpsite(s) only. The ultimate slope of the dump shall not exceed 28°. Monitoring & management of existing reclaimed dumpsites shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment & Forests and its Regional office located at Bhopal on yearly basis.	<p>The overburden from the mine is being stored at their earmarked location and also dump design is in line with approved Mining Plan (Revision II) and slope stability report.</p> <p>Currently, the dumps are active and there is no dumpsite is available for reclamation as the mine is in the initial phase of operation. However, backfilling of excavated area has been started from 3rd year of operation i.e. 2021-22 which is under initial phase and later on the same will be reclaimed as per the approved Mine Closure Plan.</p>
xvi.	<p>Catch drains and siltation ponds of appropriate size shall be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected shall be utilized for watering the mine area, roads, green belt development, etc.</p> <p>The drains shall be regularly de-silted and maintained properly.</p> <p>Garland drains (size, gradient and length) and sump capacity shall be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity shall also provide adequate retention period to allow proper settling of silt material.</p>	<p>Siltation pond followed by garland / catch drain around the mine area, external OB dump and coal stock yard etc. has been provided to arrest the flows from OB dump /coal stock yard. The drains are being regularly de-silted during the pre and post monsoon season and have been maintained properly.</p> <p>One sump of sufficient capacity has been provided within the mine to cater the peak sudden rainfall and discharge/seepage from adjoining areas. The water so collected in sump is being utilized for watering the mine area, roads, green belt development, etc.</p>
xvii.	Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation shall be based on the rainfall data.	Presently, OB dumps are in the active stage. The provision of retaining wall will be complied once the OB dumps reach to its final stage.
xviii.	Crushers at the CHP of adequate capacity for the expansion project shall be operated with high efficiency bag filters, water sprinkling system shall	Currently, the construction of CHP is also on full swing. Hence, the compliance will

	be provided to check fugitive emissions from crushing operations, conveyor system, haulage roads, transfer points, etc.	be done when CHP becomes operational.
xix.	Drills shall be wet operated.	is being complied.
xx.	The project authorities shall undertake regular repairing and tarring of roads used for mineral transportation. A 3-tier green belt comprising of a mix of native species shall be developed all along the major approach roads.	Continuous efforts are being made on regular basis to comply with the conditions.
xxi.	Controlled blasting shall be practiced with use of delay detonators and only during daytime. The mitigative measures for control of ground vibrations and to arrest the fly rocks and boulders shall be implemented.	Services of CSIR-CIMFR has been taken for scientific design of Blast parameter to reduce ground vibration. The recommendations of competent authority are being implemented during blasting.
xxii.	A progressive afforestation plan shall be implemented covering an area of 512.584 ha at the end of mining, which includes reclaimed external OB dump (193.478 ha), internal dump (257.11 ha), and green belt (61.996 ha) and in township located outside the lease by planting native species in consultation with the local DFO/Agriculture Department. The density of the trees shall be around 2500 plants per ha. Massive plantation shall be carried out in open spaces in and around the mine and a 3-tier avenue plantation along the main approach roads to the mine.	Areas will be afforested including reclaimed areas etc. and native species of plantation will be decided in consultation with DFO/Agriculture department. Technical and Biological reclamation plan as per approved Mine Plan (Rev II) has already been submitted to your good office. The plantation has been carried out in vacant spaces on the occasion of "World Environment Day (5 th June) and during the monsoon season within the project area i.e. Safety zone, bank of Garia nalla, CHP area etc. The list comprises details of plantation is attached herewith as Annexure 3 as mentioned above in Point no. (xiv).
xxiii.	An estimated 61.73 M Cum of OB will be generated during the entire life of the mine. Out of which 29.23 Mm ³ of OB will be dumped in four external OB dump in non-coal bearing area. The maximum height of external OB dump for hard OB will not exceed 30 m each. The maximum slope of the dump shall not exceed 28°. Monitoring and management of reclaimed dump sites shall continue till the vegetation becomes self-sustaining and compliance status shall be submitted to MOEF and its Regional Office on yearly basis.	As per the approved Mine Plan & Mine Closure Plan (Revision – II), total 3 nos. of OB dumps will be acquired in non-coal bearing area by OCPL out of which 2 nos. OB dumps are in active stage. Complied Compliance & Status report will be submitted to MoEF &CC and its Regional office on yearly basis along with the six monthly post EC compliance report. Also, kindly refer the point no. xv as mentioned above.
xxiv.	Of the total quarry area of ha, the backfilled quarry area of 489 ha shall be reclaimed with plantation and a void of 162 ha which is proposed to be converted into a water body, shall be gently	Back filled area will be reclaimed with plantation as per the Approved Mine Closure Plan (Rev II). Density of trees will be 2500/ha. Water body (reservoir) will

	sloped and the upper benches shall be terraced and stabilized with plantation/afforestation by planting native plant species in consultation with the local DFO/Agriculture Department. The density of the trees shall be around 2500 plants per ha	be gently sloped. Plantation of native species will be done with consultation of DFO/Agriculture department.
xxv.	The proponent should prepare restoration and reclamation plan for the degraded area. The land be used in a productive and sustainable manner.	Will be complied as specified in approved Mining Plan (Rev II).
xxvi.	Compensatory Ecological & Restoration of waste land, other degraded land and OB dumps in lieu of breaking open the land be carried out	Will be complied as specified in approved Mining Plan (Rev II).
xxvii.	The mining should be phased out in sustainable manner. No extra over burden dumps are permitted.	Noted and being complied as per approved Mining Plan (Rev II).
xxviii.	No groundwater shall be used for mining operations.	Being complied as no ground water is being utilized for mining operations.
xxix.	Regular monitoring of groundwater level and quality shall be carried out by establishing a network of existing wells and construction of new piezometers. The monitoring for quantity shall be done four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons and for quality in May. Data thus collected shall be submitted to the Ministry of Environment & Forests and to the Central Pollution Control Board quarterly within one month of monitoring.	Monitoring of groundwater level and quality has been carried out by establishing a network of existing dug wells and construction of new piezometers. The monitoring of ground water level as prescribed in conditions is being carried out in surrounding villages and other locations as no bore well is constructed inside the project area due to non-availability of ground water. The water level monitoring report in this regard for the Month of May and August 2021 is attached herewith as Annexure 4 . Also, the ground water quality is being monitored regularly on monthly basis in 2 villages i.e. Dulinga and Parmanandpur located in buffer zone and in one location in core zone. The copy of same for the month of May and August 2021 is attached along with Annexure 4 .
xxx.	The Company shall put up artificial groundwater recharge measures for augmentation of groundwater resource in case monitoring indicates a decline in water table. The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine	Sump of sufficient capacity has been provided as artificial ground water recharge measures within the mine to recharge the ground water table of the adjoining areas. The siltation pond followed by Garland drains will also help in retaining the rain water and recharge of ground water table.
xxxi.	Sewage treatment plant shall be installed in the existing colony. ETP shall also be provided for workshop and CHP wastewater.	Sewage Treatment Plant (STP) will be installed to treat the generated domestic waste water at required places i.e. mine colony and the STP treated

		water will be reused in horticulture development within the colony. ETP shall also be installed as specified.
xxxii.	Besides carried out regular periodic health checkup of their workers, 10% of the workers identified from workforce engaged in active mining operations shall be subjected to health checkup for occupational diseases and hearing impairment, if any, through an specialized agency/institution within the District/State and the results reported to this Ministry and to DGMS	Being complied with as per applicable guidelines of The Mines Rules, 1955.
xxxiii.	There are 370 PDFs and 385 PAFs. Land oustees shall be compensated as per the norms laid out R&R Policy of CIL or the National R&R Policy or R&R Policy of the State Government whichever is higher	Complied as per the provisions of Odisha R&R Policy, 2006.
xxxiv.	For monitoring land use pattern and for post mining land use, a time series of land use maps, based on satellite imagery (on 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 concerned Regional Office.	The land use / land cover study for core zone & buffer zone of Manoharpur Coal Mine Project has been carried out during the year 2018 and the report has also been prepared by M/s Geosys Enterprise Solutions Private Limited, Hyderabad, Telangana. The copy of report showing the detailed land use / land cover study using the Remote Sensing Technique and GIS has been submitted to your good office along with post EC compliance report vide letter dated 26.11.2020 (Refer Annexure 4). Further, the due land use study for 2021 is under progress and after completion of same; the land use study report will be submitted to your good office.
xxxv.	A detail final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests within 6 months of grant of Environmental Clearance	<p>The approved Mine Plan and Mine Closure Plan (Rev II) has been submitted to MoEF&CC on dated 08.05.2018.</p> <p>Further, the Mining Plan & Mine Closure Plan (Rev-III), has been approved on 26-09-2019 by MoC for 16 MTPA which includes the expansion of Manoharpur Coal Mine towards its Dipside. The environmental clearance (EC) application for the proposed expansion from 8 to 16 MTPA has already been submitted to MoEF&CC as per the approved Mining Plan (Rev-III). Also, MoEF&CC has approved the Terms of Reference (ToR) vide letter dt. 29.04.2020 for further EIA/EMP study. Accordingly, the draft EIA/EMP study</p>

		report was prepared & submitted to Odisha State Pollution Control Board (OSPCB) for public hearing which has been conducted successfully on 23.03.2021.
xxxvi.	The project authorities shall in consultation with the Panchayats of the local villages and administration identify socio-economic and welfare measures under CSR to be carried out over the balance life of the mine	As mentioned above in Point no. (ix), CSR activities is being carried out in consultation with concerned Panchayat / local administration.
xxxvii.	The proponent should implement the assurances given during the Public Hearing	Assurance given during the Public Hearing is being implemented in the vicinity of project area.
xxviii.	<p>Corporate Environment Responsibility: The Company shall have a well laid down Environment Policy approved by the Board of Directors.</p> <p>The Environment Policy shall prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions</p> <p>The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions shall be furnished</p> <p>To have proper checks and balances, the company shall have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large</p>	<p>Environment policy has been approved by Board and it is in place.</p> <p>Will be complied with.</p> <p>There is an environment management cell comprises of technical qualified persons who is taking care of all environmental compliances of clearances and monitoring. The cell is headed by Head of Company through Mine Agent.</p> <p>Organizational Structure for Environmental Management & System of Reporting of Non-compliance - The Environmental Management Cell (EMC) has important role for coordination of the actions required for environmental management, mitigation, and for monitoring the progress of the proposed management plans and actions to be taken. The cell is responsible for monitoring of the implementation of the environment issues.</p>
GENERAL CONDITIONS		
i.	No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment and Forests.	Prior approval will be obtained, if applicable.
ii.	No change in calendar plan of production for quantum of mineral coal shall be made.	Agreed and if there is any change in calendar plan of production of coal, due permission/approval shall be obtained from competent authority complying the MoEF&CC guidelines in this regard.

iii.	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM ₁₀ , PM _{2.5} , SO ₂ and NO _x monitoring. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc carried out at least once in six months.	<p>The monthly environmental monitoring including ambient air quality is being carried out regularly in the core zone (4 locations) as well as in the buffer zone (4 locations) by MoEF&CC/NABL/OSCPB accredited laboratory M/s Visiontek Consultancy Services Pvt. Ltd. for PM₁₀, PM_{2.5}, SO_x, and NO_x and the copy of same is being submitted regularly to Odisha State Pollution Control Board (OSPCB). Also, the monitoring of heavy metals such as Hg, As, Ni, Cd, Cr etc. has been carried out on six monthly basis in January month 2021 for core zone and buffer zone. The test results show that monitored parameters are well within the permissible limits as prescribed by MoEF&CC and test report in this regard was submitted to your good office along with six monthly compliance report for the period of 'October 2020 to March 2021' (Refer Annexure 3).</p> <p>The latest monitoring report for the month of October 2021 showing the results of pollutants i.e. PM₁₀, PM_{2.5}, SO_x, NO_x and CO for is attached as Annexure 5.</p>
iv.	Data on ambient air quality (PM ₁₀ , PM _{2.5} , SO ₂ and NO _x) and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring data shall be regularly submitted to the Ministry including its concerned Regional Office and to the State Pollution Control Board and the Central Pollution Control Board once in six months. Random verification of samples through analysis from independent laboratories recognized under the EPA rules, 1986 shall be furnished as part of compliance report.	Kindly refer the Point no. iii (General Condition) as mentioned above.
v.	Adequate measures shall be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with ear plugs/muffs	<p>Complied.</p> <p>The noise quality monitoring is being carried out regular on monthly basis at various places of core zone and buffer zone and adequate measures are followed to control the noise level below 85 dBA in the working environment. The latest noise quality monitoring report for the month of October 2021 is attached herewith as Annexure 6.</p> <p>Also, workers engaged in blasting and drilling operations, operation of HEMM, etc. have been provided with proper</p>

		PPE's i.e. ear plugs/muffs, helmet, safety shoe etc.
vi.	Industrial Wastewater (workshop and wastewater from the mine) shall 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 shall be installed before discharge of workshop effluents	Will be complied with as the construction of Effluent Treatment Plant (ETP) consisting of oil & grease trap is under progress.
vii.	Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transporting the mineral shall be covered with tarpaulins and optimally loaded.	Is being Complied
viii.	Monitoring of environmental quality parameters shall be carried out through a laboratory recognized under EPA Rules, 1986	The environmental monitoring is being carried out as mentioned above in Point no. iii (General Condition).
ix.	Personnel working in dusty areas shall wear protective respiratory devices and they shall also be provided with adequate training and information on safety and health aspects.	Agreed and is being complied with.
x.	Occupational health surveillance programme of the workers shall be undertaken periodically to observe any contractions due to exposure to dust and to take corrective measures, if needed and records maintained thereof. The quality of environment due to outsourcing and the health and safety issues of the outsourced manpower should be addressed by company while outsourcing.	Initial Medical Examination (IME) of the workers is being complied carried out as per applicable norms of Coal Mine Rules. Further, periodically occupational health checkup of workers will be taken up in near future. The health & safety issues of the out sourced man power are duly addressed in Notice Inviting Tender (NIT) and in Work orders.
xi.	A separate environmental management cell with suitable qualified personnel shall be set up under the control of a Senior Executive, who will report directly to the Head of the company.	An environment management cell comprising of technical qualified personnel has been working in the organization who is directly reporting to the Head of Company through Mine Agent.
xii.	The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose. Year-wise expenditure shall be reported to this Ministry and its concerned Regional Office.	Year-wise expenditure incurred on environmental protection measures has already been submitted for the period of FY 2018-19, 2019-20 & 2020-21 along with post EC compliance report vide letter dated 06.11.2020.
xiii.	The Project authorities shall advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular language of the locality concerned within seven days of the clearance letter informing that the project has been accorded	Complied.

	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	
xiv.	A copy of the environmental clearance letter shall be marked to concern Panchayat/Zila Parishad, Municipal Corporation or Urban local body and local NGO, if any, from whom any suggestion/representation has been received while processing the proposal. A copy of the clearance letter shall also be displayed on company's website	Complied.
xv.	A copy of environmental clearance letter shall also be displayed on the website of the concerned State Pollution Control Board. The EC letter shall also be displayed at the Regional Office, District Industry Sector and Collector's Office/Tehsildar's Office for 30 days	Complied
xvi.	The clearance letter, shall be uploaded on the company's website. The compliance status of the stipulated environmental clearance conditions shall also be uploaded by the project authorities on their website and updated at least once every six months so as to bring the same in public domain. The monitoring data of environmental quality parameter (air, water, noise and soil) and critical pollutant such as PM10, PM2.5, SO2 and Nox (ambient) and critical sectoral parameters shall also be displayed at the entrance of project premises and mine office and in corporate office and on company's website	The environmental clearance letter along with compliance status of stipulated conditions has been uploaded on company website which can be seen at the following link: http://ocpl.org.in/Environment.asp
xvii.	The project proponent shall submit six monthly compliance reports on status of compliance of the stipulated environmental clearance conditions (both in hard copy and in e-mail) to the respective Regional Office of the Ministry, respective Zonal Offices of CPCB and the SPCB.	Being Complied in confirmation to notification issued by MOEF&CC vide letter no. S.O. 5845 (E) dated 26.11.2018 and MoEF&CC (ERO) vide letter no. File No : 106-12/EPE dated 11.05.2020.
xviii.	The Regional Office of this Ministry located in the Region shall monitor compliance of the stipulated conditions. The Project authorities shall extend full cooperation to the office(s) of the Regional Office by furnishing the requisite data/information/monitoring reports.	Project authorities will extend full cooperation to the Ministry Regional Office.

xix.	The environmental statement for each financial year ending 31 March in Form V is mandated to be submitted by the project proponent for the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be uploaded on the company's website along with the status of compliance of EC conditions and shall be sent to the respective Regional Offices of the MoEF by e-mail.	Being Complied.
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ENVIRONMENTAL CLEARANCE(EC) COMPLIANCE REPORT

MANOHARPUR OPENCAST COAL MINE PROJECT

(Amendment vide letter No. EC-No. J-11015 / 139/2008-IA.II (M) Pt. file Dated 06TH November 2019)

Sr. No.	EC Letter Condition	Compliance
C. CONDITIONS		
i.	High rated tippers i.e. 25 to 30 tonne capacity coal carrying tippers for same quantity shall be used to reduce number of trips.	complied.
ii.	Accordingly, 9200 TPD of coal from Manoharpur Coal Mine to Kanika siding / ACB siding / any other Indian railway siding in the near vicinity of mine (23 km) by road and from there to Ib TPP of OPGC by Indian rail.	Transportation of coal to captive power plant of OPGC (2 x 660 MW each) through MGR has been started on 29.08.2021. However due to some technical issues pertaining to carrying capacity of rail engine; coal is also being transported through the ACB siding by road as an interim arrangement till the MGR becomes fully operational. Further, coal is also being transported from mine end to Kanika Railway Siding of MCL by road as an interim arrangement and the same is being utilized under the provisions of Allotment Agreement (Clause – 8). The quantity of daily dispatch by road is well within the approved limit.
iii.	Further, 3000 TPD of coal from Manoharpur Coal Mine to Ib TPP directly by road (i.e. 117 km road) only if Route 1 is not available. The stretch of 1.2 km having width of ~ 5.5 mts (single lane) shall be widened to 7mts width and made double lane before commencement of transportation.	No coal is presently being transported by OCPL through this Route.
iv.	All necessary environment mitigation such as tree plantation, mechanized road sweeping should be taken to prevent increase in air pollution level in villages/settlements lying within 100 m (23 km till Kanika Railway siding) along the Route 1 and villages/settlements (117 km road) lying along the Route 2.	Necessary mitigation measures i.e. water sprinkling, manual road sweeping, proper covering of coal carrying tippers etc. are being carried out at site to prevent increase in air pollution level in nearby villages.

v.	The state pollution control board, while considering consent to operate for project, shall ensure that with the proposed coal transportation by road, air quality would remain within the national ambient air quality standards.	<p>Noted & agreed.</p> <p>An intimation letter has already been submitted to Odisha State Pollution Control Board (OSPCB) regarding the obtaining of EC from MoEF&CC for transportation of coal from Manoharpur coal mine to Kanika siding of MCL through road.</p> <p>Further, the renewal of consent to operate has been obtained from OSPCB vide letter dated 23.03.2021.</p>
vi.	Implementation of MGR shall be expedited.	MGR has been constructed and is in operation.
vii.	All the recommendations given in study on Traffic Impact Assessment Report shall be complied.	Is being complied.

Manoharpur Opencast Coal Mine Project (8 MTPA), Ib Valley, Dist. Sundargarh, Odisha

Annexure 1

Expenditure Details on Activities mentioned under Wildlife Management Plan

Sr. No.	Description of Work / Activity	Expenditure Amount
1	Engagement of One Van Pal (1) for 15 Month @ Rs. 15000 Per Month	2,25,000
2	Grass seeding & plantation by In-house Team	5,87,000
3	Construction of one check dam by In-house Team of MO & OCPL	1,00,000
4	Fire Fighting Vehicle provided to Forest Officials for fire watch	6,00,000
5	Barbed Wire Fencing around Periphery of Manoharpur Coal Mine Block	65,93,000
	Total	81,05,000/-

Manoharpur Coal Mine Project, Tehsil Hemgir, Dist. Sundergarh, Odisha

ANNEXURE 2

Year wise Expenditure Detail on CSR / Peripheral Development

Sl.No	Sectors	OPGC	OCPL							Total Expenditure on CSR / Peripheral Development
		2008-2015	2015-2016	2016-2017	2017-2018	2018-19	2019-20	2020-21	2021-22 (Till Sept'21)	
1	Health	16922646	95000	225900	414000	412309	243562	279352		
2	Education		1290000	1244300	1326500	912000	300000	0		
3	Skill Development			2151263	1854000	1925170	2143354	1338985		
4	Socio-Culture		168000	100560	305000	565000	150000	25000		
5	Sports		226000		117800	140000	95000	40000		
6	Rural Infrastructure			3114404	3791751	2340609	1969011	3188081	10,00,000	
7	Livelihood		0	0	0		0	0		
8	Water Sanitation		0	0	330000	440000	169000	0	7,78,260	
9	Public Relation		0	0	0	64000	0	0		
10	Environment								97,000	
	Total	1,69,22,646	17,79,000	68,36,427	81,39,051	67,99,088	50,69,927	48,71,418	18,75,260	5,22,92,817

Note: Rs. 16922646 expenditure submitted by OPGC to OCPL

Manoharpur Coal Mine Project of Odisha Coal and Power Limited (Annexure 3)

Details of Green Area / Plantation Development

The tree species planted under the green area development within ML & project area are as follows:

Tree Species	Plantation during (FY 2019-20)	Plantation during (FY 2020-21)	Plantation during (FY 2021-22)	Total
Mango	518	85	78	681
Amla	502	154	205	861
Neem	504	421	653	1578
Jackfruit	2	2	7	11
Guava	1	6	194	201
Ashok	22	10	-	32
Bakula	-	5	10	15
Jamun	503	-	80	583
Astelia	2	-	-	2
Monterey cypress	2	-	-	2
Norfolk island pine	2	-	-	2
Acalypha	4	-	-	4
Sago palm	2	-	-	2
Bahude	500	-	-	500
Harida	500	-	-	500
Seena Tora	-	5	-	5
Pongame Oil Tree	-	10	-	10
Drumstick Tree	-	8	50	58
Custard Apple Tree	-	303	108	411
Cassia	-	5	-	5
Debadaru	-	85	289	374
Karanj	-	441	10	451
Papaya	-	18	-	18
Sajana	-	15	-	15
Teak	-	100	42	142
Krushna Chuda	-	-	122	122
Radha Chuda	-	-	562	562
Simli	-	-	30	30
Chakunda	-	-	254	254
Semarua	-	-	42	42
Bottle Plant	-	-	46	46
Baula	-	-	33	33
Paper Flower	-	-	830	830
Sandal	-	-	22	22
Kusum	-	-	60	60

Resam / Tutth	-	-	50	50
Kadam	-	-	10	10
Saras	-	-	10	10
Total	3064	1673	3797	8534

Area covered under planation = 15.926 Hac + 0.809 Hac + 3.25 Ha = 19.985 Hac

Plantation Details of Surrounding Area Developed by OCPL

Apart from the above, Approx. 18008 nos. of native plant species have been planted in surrounding areas i.e. R&R colony (Phase 1 & 2). Area covered under plantation is about 4.0 Hac.



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- Environmental & Social Study

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- Renewable Energy

- Agricultural Development
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- Public Health Engineering

- Mine Planning & Design
- Mineral/Sub-Soil Exploration
- Waste Management Services

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 &
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Ref: Envlab/21/R-1674

Date : 02.06.2021

ANNEXURE 4

GROUND WATER LEVEL REPORT MAY-2021

1. Name of Project : **Manoharpur Open Cast Coal Mine Project**
2. Name of Industry : **Odisha Coal and Power Limited (OCPL), Sundargarh**

Sl. No.	Date of Monitoring	Sampling Location	Location Co-ordinates	Water Level in meters
1	27.05.2021	Paramanandapur Village	21° 57' 18.1116" N 83° 45' 56.8764" E	3.20
2	27.05.2021	Kathapali Village	21° 56' 26.8044" N 83° 46' 8.9724" E	4.88
3	27.05.2021	Dulanga Village	21° 56' 44.7468" N 83° 47' 54.978" E	8.53
4	27.05.2021	Sangamuda Village	21° 57' 40.59" N 83° 47' 37.6404" E	5.30
5	27.05.2021	Kalamegha Village	21° 56' 54.6036" N 83° 50' 32.9892" E	4.72
6	27.05.2021	Sarbahal Village	21° 58' 20.5824" N 83° 48' 37.5408" E	6.52

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Ref: Envlab/21/R-1675

Date : 02.06.2021

GROUND WATER LEVEL REPORT MAY-2021

1. Name of Project : Manoharpur Open Cast Coal Mine Project
2. Name of Industry : Odisha Coal and Power Limited (OCPL), Sundargarh

Sl. No.	Date of Monitoring	Sampling Location	Location Co-ordinates	Water Level in meters
1	28.05.2021	HD 02 PW	21.95678° N 83.73626° E	19.20
2	28.05.2021	HD 02 OW	21.95674° N 83.74595° E	20.36
3	28.05.2021	HD 04 PW	21.94017° N 83.77429° E	6.16
4	28.05.2021	HD 04 OW	21.94038° N 83.77423° E	6.52


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Ref: Envlab/21/R-1554

Date: 04.06.2021

GROUND WATER QUALITY REPORT MAY-2021

(CORE ZONE)

1. Name of Project : **Manoharpur Open Cast Coal Mine Project**
2. Name of Industry : **Odisha Coal and Power Limited (OCPL), Sundargarh**
3. Name of the Location : **Ground Water (Borehole at BGR Camp Site)**
4. Location Co-ordinates : **21° 56' 58.1748" N, 83° 47' 44.5668" E**
5. Date of Sampling : **05.05.2021**
6. Date of Receiving : **06.05.2021**
7. Date of Analysis : **06.05.2021 to 13.05.2021**
8. Sample Collected By : **VCSPL Representative**

SL. No.	Name of the Parameters	Unit	Testing Method	Standard as per IS 10500:2012, Amnd. 2015 & 2018 (Acceptable Limit)	Analysis Result
1.	pH (at 25 °C)	---	APHA 4500H ⁺ B	6.5-8.5	7.32
2.	Color	Hazen	APHA 2120 B,C	5.0 (max)	<5
3.	Odor	---	APHA 2150 B	Agreeable	Agreeable
4.	Taste	---	APHA 2160 C	Agreeable	Agreeable
5.	Turbidity	NTU	APHA 2130 B	1.0 (max)	<1.0
6.	Residual Free Chlorine	mg/l	APHA:4500 Cl ⁻ B	0.2 (min)	ND
7.	Total Dissolved Solids	mg/l	APHA 2540 C	500.0(max)	262.0
8.	Electrical Conductivity	μS/cm	APHA 2510 C	---	397.6
9.	Total Alkalinity as CaCO ₃	mg/l	APHA 2320 B	200(max)	80.0
10.	Total Hardness as CaCO ₃	mg/l	APHA 2340 C	200(max)	110.0
11.	Calcium as Ca	mg/l	APHA 3500 Ca B	75(max)	35.2
12.	Magnesium as Mg	mg/l	APHA 3500Mg B	30(max)	5.4
13.	Chloride as Cl	mg/l	APHA 4500Cl ⁻ B	250(max)	31.5
14.	Fluoride as F	mg/l	APHA 4500 F ⁻ C, D	1.0(max)	0.25
15.	Sulphide	mg/l	APHA 4500 -S.D	0.05(max)	ND
16.	Sulphate as SO ₄	mg/l	APHA 4500 SO ₄ ⁻ E	200(max)	14.8
17.	Nitrate as NO ₃	mg/l	APHA 4500 NO ₃ ⁻ B	45(max)	0.76
18.	Ammonical Nitrogen as NH ₃ -N	mg/l	APHA 4500 NH ₃ C	0.5(max)	BDL
19.	Hexavalent Chromium as Cr ⁶⁺	mg/l	APHA 3500 Cr B	--	BDL
20.	Phenolic Compounds as C ₆ H ₅ OH	mg/l	APHA 5530-B, D	0.001(max)	BDL
21.	Cyanide as CN	mg/l	APHA 4500 CN ⁻ C E	0.05(max)	BDL
22.	Sodium as Na	mg/l	APHA 3500 Na, B	---	5.2
23.	Potassium as K	mg/l	APHA 3500K, B	---	4.4
24.	Copper as Cu	mg/l	APHA 3111 B	0.05(max)	BDL
25.	Iron as Fe	mg/l	APHA 3111 B	1.0(max)	0.25
26.	Manganese as Mn	mg/l	APHA 3111 B	0.1(max)	BDL
27.	Mercury as Hg	mg/l	APHA 3112 B	0.001(max)	BDL
28.	Cadmium as Cd	mg/l	APHA 3111 B	0.003(max)	BDL
29.	Selenium as Se	mg/l	APHA 3500 Se C	0.01(max)	BDL



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30.	Arsenic as As	mg/l	APHA 3500 As	0.01(max)	BDL
31.	Lead as Pb	mg/l	APHA 3111 B	0.01(max)	BDL
32.	Zinc as Zn	mg/l	APHA 3111 B	5.0(max)	0.43
33.	Nickel as Ni	mg/l	APHA 3111 B	0.02(max)	BDL
34.	Total Chromium as Cr	mg/l	APHA 3111 B	0.05(max)	BDL
35.	Boron as B	mg/l	APHA 4500 B, B	0.5(max)	BDL
36.	Silver as Ag	mg/l	APHA 3111 B	0.1(max)	BDL
37.	Barium as Ba	mg/l	APHA 3111 B	0.7(max)	BDL
38.	Aluminium as Al	mg/l	APHA 3500 Al B	0.2(max)	BDL
39.	Anionic detergent as MBAS	mg/l	APHA 5540 C	1.0(max)	ND
40.	Mineral Oil	mg/l	APHA 5220 B	0.5(max)	ND
41.	Total Coliform	MPN/100ml	APHA 9221 B	Shall not be detectable in any 100 ml	<1.1
42.	EColi	MPN/100ml	APHA 9221 E	Shall not be detectable in any 100 ml	Absent
43.	Feacal Coliform	MPN/100ml	APHA 9221 F	---	<1.1
44.	Pesticides	mg/l	APHA 6630 C	---	Absent

BDL Value: Cu <0.02mg/l, Al <0.1mg/l, B <0.1mg/l, Ba <0.1mg/l, Mn <0.05mg/l, Hg <0.002 mg/l, Cd <0.01 mg/l, Se <0.001 mg/l, As <0.004 mg/l, Pb <0.01mg/l, Ni <0.05 mg/l, Cr <0.05mg/l, NH₃-N < 0.1mg/l, Cr⁶⁺ <0.01mg/l, Phenol <0.05mg/l, CN <0.01mg/l, Ag <0.1mg/l, TC & FC : MPN/100 ml < 1.1 (0-0-0)

Reviewed by



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Ref:Envlab/21/R-1557

Date: 04.06.2021

GROUND WATER QUALITY REPORT MAY-2021 (BUFFER ZONE)

1. Name of Project : **Manoharpur Open Cast Coal Mine Project**
2. Name of Industry : **Odisha Coal and Power Limited (OCPL), Sundargarh**
3. Name of the Location : **Ground Water-1: Tube well at Paramanandpur Village**
4. Location Co-ordinates : **GW-1: 21° 57' 15.4476" N, 83° 45' 54.144" E**
5. Date of Sampling : **07.05.2021**
6. Date of Receiving : **10.05.2021**
7. Date of Analysis : **10.05.2021 to 17.05.2021**
8. Sample Collected By : **VCSPL Representative**

SL. No.	Name of the Parameters	Unit	Testing Method	Standard as per IS 10500:2012, Amnd. 2015 & 2018 (Acceptable Limit)	Analysis Result
					GW-1
1.	pH (at 25 °C)	---	APHA 4500H ⁺ B	6.5-8.5	7.16
2.	Color	Hazen	APHA 2120 B,C	5.0 (max)	<5
3.	Odor	---	APHA 2150 B	Agreeable	Agreeable
4.	Taste	---	APHA 2160 C	Agreeable	Agreeable
5.	Turbidity	NTU	APHA 2130 B	1.0 (max)	<1.0
6.	Residual Free Chlorine	mg/l	APHA:4500 Cl ⁻ B	0.2 (min)	ND
7.	Total Dissolved Solids	mg/l	APHA 2540 C	500.0(max)	231.0
8.	Electrical Conductivity	μS/cm	APHA 2510 C	---	354.6
9.	Total Alkalinity as CaCO ₃	mg/l	APHA 2320 B	200(max)	62.0
10.	Total Hardness as CaCO ₃	mg/l	APHA 2340 C	200(max)	78.0
11.	Calcium as Ca	mg/l	APHA 3500 Ca B	75(max)	24.0
12.	Magnesium as Mg	mg/l	APHA 3500Mg B	30(max)	4.4
13.	Chloride as Cl	mg/l	APHA 4500Cl ⁻ B	250(max)	23.5
14.	Fluoride as F	mg/l	APHA 4500 F ⁻ C, D	1.0(max)	0.23
15.	Sulphide	mg/l	APHA 4500 -S.D	0.05(max)	ND
16.	Sulphate as SO ₄	mg/l	APHA 4500 SO ₄ ⁻ E	200(max)	14.6
17.	Nitrate as NO ₃	mg/l	APHA 4500 NO ₃ ⁻ B	45(max)	0.74
18.	Ammonical Nitrogen as NH ₃ -N	mg/l	APHA 4500 NH ₃ C	0.5(max)	BDL
19.	Hexavalent Chromium as Cr ⁶⁺	mg/l	APHA 3500 Cr B	--	BDL
20.	Phenolic Compounds as C ₆ H ₅ OH	mg/l	APHA 5530-B, D	0.001(max)	BDL
21.	Cyanide as CN	mg/l	APHA 4500 CN ⁻ C E	0.05(max)	BDL
22.	Sodium as Na	mg/l	APHA 3500 Na, B	---	6.8
23.	Potassium as K	mg/l	APHA 3500K, B	---	4.4
24.	Copper as Cu	mg/l	APHA 3111 B	0.05(max)	BDL
25.	Iron as Fe	mg/l	APHA 3111 B	1.0(max)	0.26
26.	Manganese as Mn	mg/l	APHA 3111 B	0.1(max)	BDL
27.	Mercury as Hg	mg/l	APHA 3112 B	0.001(max)	BDL
28.	Cadmium as Cd	mg/l	APHA 3111 B	0.003(max)	BDL



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&
Microbiology Lab

29.	Selenium as Se	mg/l	APHA 3500 Se C	0.01(max)	BDL
30.	Arsenic as As	mg/l	APHA 3500 As	0.01(max)	BDL
31.	Lead as Pb	mg/l	APHA 3111 B	0.01(max)	BDL
32.	Zinc as Zn	mg/l	APHA 3111 B	5.0(max)	0.57
33.	Nickel as Ni	mg/l	APHA 3111 B	0.02(max)	BDL
34.	Total Chromium as Cr	mg/l	APHA 3111 B	0.05(max)	BDL
35.	Boron as B	mg/l	APHA 4500 B, B	0.5(max)	BDL
36.	Silver as Ag	mg/l	APHA 3111 B	0.1(max)	BDL
37.	Barium as Ba	mg/l	APHA 3111 B	0.7(max)	BDL
38.	Aluminium as Al	mg/l	APHA 3500 Al B	0.2(max)	BDL
39.	Anionic detergent as MBAS	mg/l	APHA 5540 C	1.0(max)	ND
40.	Mineral Oil	mg/l	APHA 5220 B	0.5(max)	ND
41.	Total Coliform	MPN/100ml	APHA 9221 B	Shall not be detectable in any 100 ml	<1.1
42.	EColi	MPN/100ml	APHA 9221 E	Shall not be detectable in any 100 ml	Absent
43.	Feacal Coliform	MPN/100ml	APHA 9221 F	---	<1.1
44.	Pesticides	mg/l	APHA 6630 C	---	Absent

BDL Value: Cu <0.02mg/l, Al <0.1mg/l, B <0.1mg/l, Ba <0.1mg/l, Mn<0.05mg/l, Hg<0.002 mg/l, Cd <0.01 mg/l, Se <0.001 mg/l, As <0.004 mg/l, Pb<0.01mg/l, Ni<0.05 mg/l, Cr <0.05mg/l, NH₃-N< 0.1mg/l, Cr⁺⁶<0.01mg/l, Phenol <0.05mg/l, CN <0.01mg/l, Ag<0.1mg/l, TC & FC : MPN/100 ml < 1.1 (0-0-0)

Reviewed by



Approved by





Ref:Envlab/21/R-1558

Date: 04.06.2021

GROUND WATER QUALITY REPORT MAY-2021

(BUFFER ZONE)

1. Name of Project : **Manoharpur Open Cast Coal Mine Project**
2. Name of Industry : **Odisha Coal and Power Limited (OCPL), Sundargarh**
3. Name of the Location : **Ground Water-2: Tube Well at Dulanga Village**
4. Location Co-ordinates : **GW-2: 21° 56' 46.1832" N, 83° 47' 55.3164" E**
5. Date of Sampling : **10.05.2021**
6. Date of Receiving : **11.05.2021**
7. Date of Analysis : **11.05.2021 to 18.05.2021**
8. Sample Collected By : **VCSPL Representative**

SL. No.	Name of the Parameters	Unit	Testing Method	Standard as per IS 10500:2012, Amnd. 2015 & 2018 (Acceptable Limit)	Analysis Result
					GW-2
1.	pH (at 25 °C)	---	APHA 4500H ⁺ B	6.5-8.5	7.28
2.	Color	Hazen	APHA 2120 B,C	5.0 (max)	<5
3.	Odor	---	APHA 2150 B	Agreeable	Agreeable
4.	Taste	---	APHA 2160 C	Agreeable	Agreeable
5.	Turbidity	NTU	APHA 2130 B	1.0 (max)	<1.0
6.	Residual Free Chlorine	mg/l	APHA:4500 Cl ⁻ B	0.2 (min)	ND
7.	Total Dissolved Solids	mg/l	APHA 2540 C	500.0(max)	244.0
8.	Electrical Conductivity	μS/cm	APHA 2510 C	---	379.3
9.	Total Alkalinity as CaCO ₃	mg/l	APHA 2320 B	200(max)	74.0
10.	Total Hardness as CaCO ₃	mg/l	APHA 2340 C	200(max)	86.0
11.	Calcium as Ca	mg/l	APHA 3500 Ca B	75(max)	27.6
12.	Magnesium as Mg	mg/l	APHA 3500Mg B	30(max)	4.1
13.	Chloride as Cl	mg/l	APHA 4500Cl ⁻ B	250(max)	28.0
14.	Fluoride as F	mg/l	APHA 4500 F ⁻ C, D	1.0(max)	0.22
15.	Sulphide	mg/l	APHA 4500 -S.D	0.05(max)	ND
16.	Sulphate as SO ₄	mg/l	APHA 4500 SO ₄ ⁻ E	200(max)	15.1
17.	Nitrate as NO ₃	mg/l	APHA 4500 NO ₃ ⁻ B	45(max)	0.62
18.	Ammonical Nitrogen as NH ₃ -N	mg/l	APHA 4500 NH ₃ C	0.5(max)	BDL
19.	Hexavalent Chromium as Cr ⁺ ₆	mg/l	APHA 3500 Cr B	--	BDL
20.	Phenolic Compounds as C ₆ H ₅ OH	mg/l	APHA 5530-B, D	0.001(max)	BDL
21.	Cyanide as CN	mg/l	APHA 4500 CN ⁻ C E	0.05(max)	BDL
22.	Sodium as Na	mg/l	APHA 3500 Na, B	---	6.0
23.	Potassium as K	mg/l	APHA 3500K, B	---	3.8
24.	Copper as Cu	mg/l	APHA 3111 B	0.05(max)	BDL
25.	Iron as Fe	mg/l	APHA 3111 B	1.0(max)	0.25
26.	Manganese as Mn	mg/l	APHA 3111 B	0.1(max)	BDL
27.	Mercury as Hg	mg/l	APHA 3112 B	0.001(max)	BDL
28.	Cadmium as Cd	mg/l	APHA 3111 B	0.003(max)	BDL



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Material Lab
Soil Lab
Mineral Lab
&
Microbiology Lab

29.	Selenium as Se	mg/l	APHA 3500 Se C	0.01(max)	BDL
30.	Arsenic as As	mg/l	APHA 3500 As	0.01(max)	BDL
31.	Lead as Pb	mg/l	APHA 3111 B	0.01(max)	BDL
32.	Zinc as Zn	mg/l	APHA 3111 B	5.0(max)	0.61
33.	Nickel as Ni	mg/l	APHA 3111 B	0.02(max)	BDL
34.	Total Chromium as Cr	mg/l	APHA 3111 B	0.05(max)	BDL
35.	Boron as B	mg/l	APHA 4500 B, B	0.5(max)	BDL
36.	Silver as Ag	mg/l	APHA 3111 B	0.1(max)	BDL
37.	Barium as Ba	mg/l	APHA 3111 B	0.7(max)	BDL
38.	Aluminium as Al	mg/l	APHA 3500 Al B	0.2(max)	BDL
39.	Anionic detergent as MBAS	mg/l	APHA 5540 C	1.0(max)	ND
40.	Mineral Oil	mg/l	APHA 5220 B	0.5(max)	ND
41.	Total Coliform	MPN/100ml	APHA 9221 B	Shall not be detectable in any 100 ml	<1.1
42.	EColi	MPN/100ml	APHA 9221 E	Shall not be detectable in any 100 ml	Absent
43.	Feacal Coliform	MPN/100ml	APHA 9221 F	---	<1.1
44.	Pesticides	mg/l	APHA 6630 C	---	Absent

BDL Value: Cu <0.02mg/l, Al <0.1mg/l, B <0.1mg/l, Ba <0.1mg/l, Mn<0.05mg/l, Hg<0.002 mg/l, Cd <0.01 mg/l, Se <0.001 mg/l, As <0.004 mg/l, Pb<0.01mg/l, Ni<0.05 mg/l, Cr <0.05mg/l, NH₃-N< 0.1mg/l, Cr⁺⁶<0.01mg/l, Phenol <0.05mg/l, CN <0.01mg/l, Ag<0.1mg/l, TC & FC : MPN/100 ml < 1.1 (0-0-0)

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Laboratory Services

- Environment Lab
- Food Lab
- Material Lab
- Soil Lab
- Mineral Lab
- &
- Microbiology Lab

Ref: Envlab/21/R-4830

Date: 06.09.2021

GROUND WATER LEVEL REPORT AUGUST-2021

1. Name of Project : **Manoharpur Open Cast Coal Mine Project**
2. Name of Industry : **Odisha Coal and Power Limited (OCPL), Sundargarh**

Sl. No.	Date of Monitoring	Sampling Location	Location Co-ordinates	Source	Water Level in meters
1	13.08.2021	Paramanandapur Village	21° 57' 18.1116" N 83° 45' 56.8764" E	Open well	2.16
2	13.08.2021	Kathapali Village	21° 56' 26.8044" N 83° 46' 8.9724" E	Open well	3.38
3	13.08.2021	Dulanga Village	21° 56' 44.7468" N 83° 47' 54.978" E	Open well	4.15
4	13.08.2021	Sangamuda Village	21° 57' 40.59" N 83° 47' 37.6404" E	Open well	1.58
5	13.08.2021	Kalamegha Village	21° 56' 54.6036" N 83° 50' 32.9892" E	Open well	2.77
6	13.08.2021	Sarbahal Village	21° 58' 20.5824" N 83° 48' 37.5408" E	Open well	4.42

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Material Lab
Soil Lab
Mineral Lab
&
Microbiology Lab

Ref: Envlab/21/R-4831

Date: 06.09.2021

GROUND WATER LEVEL REPORT AUGUST-2021

1. Name of Project : Manoharpur Open Cast Coal Mine Project
2. Name of Industry : Odisha Coal and Power Limited (OCPL), Sundargarh

Sl. No.	Date of Monitoring	Sampling Location	Location Co-ordinates	Source	Water Level in meters
1	17.08.2021	HD 02 PW	21.95678° N 83.73626° E	Bore hole	18.6
2	17.08.2021	HD 02 OW	21.95674° N 83.74595° E	Bore hole	19.4
3	17.08.2021	HD 04 PW	21.94017° N 83.77429° E	Bore hole	5.3
4	17.08.2021	HD 04 OW	21.94038° N 83.77423° E	Bore hole	5.7

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Ref: Envlab/21/R-4822

Date: 06.09.2021

GROUND WATER QUALITY REPORT AUGUST-2021

(CORE ZONE)

1. Name of Project : **Manoharpur Open Cast Coal Mine Project**
2. Name of Industry : **Odisha Coal and Power Limited (OCPL), Sundargarh**
3. Name of the Location : **Ground Water (Borehole at BGR Camp Site)**
4. Location Co-ordinates : **21° 56' 58.1748" N, 83° 47' 44.5668" E**
5. Date of Sampling : **05.08.2021**
6. Date of Receiving : **06.08.2021**
7. Date of Analysis : **06.08.2021 to 14.08.2021**
8. Sample Collected By : **VCSPL Representative**

SL. No.	Name of the Parameters	Unit	Testing Method	Standard as per IS 10500:2012, Amnd. 2015 & 2018 (Acceptable Limit)	Analysis Result
1.	pH (at 25 °C)	---	APHA 4500H ⁺ B	6.5-8.5	6.96
2.	Color	Hazen	APHA 2120 B,C	5.0 (max)	<5
3.	Odor	---	APHA 2150 B	Agreeable	Agreeable
4.	Taste	---	APHA 2160 C	Agreeable	Agreeable
5.	Turbidity	NTU	APHA 2130 B	1.0 (max)	<1.0
6.	Residual Free Chlorine	mg/l	APHA:4500 Cl ⁻ B	0.2 (min)	0.25
7.	Total Dissolved Solids	mg/l	APHA 2540 C	500.0(max)	331.0
8.	Electrical Conductivity	μS/cm	APHA 2510 C	---	505.3
9.	Total Alkalinity as CaCO ₃	mg/l	APHA 2320 B	200(max)	68.0
10.	Total Hardness as CaCO ₃	mg/l	APHA 2340 C	200(max)	118.0
11.	Calcium as Ca	mg/l	APHA 3500 Ca B	75(max)	39.8
12.	Magnesium as Mg	mg/l	APHA 3500Mg B	30(max)	4.5
13.	Chloride as Cl	mg/l	APHA 4500Cl ⁻ B	250(max)	36.5
14.	Fluoride as F	mg/l	APHA 4500 F ⁻ C, D	1.0(max)	0.28
15.	Sulphide	mg/l	APHA 4500 -S.D	0.05(max)	ND
16.	Sulphate as SO ₄	mg/l	APHA 4500 SO ₄ ⁻ E	200(max)	15.7
17.	Nitrate as NO ₃	mg/l	APHA 4500 NO ₃ ⁻ B	45(max)	1.3
18.	Ammonical Nitrogen as NH ₃ -N	mg/l	APHA 4500 NH ₃ C	0.5(max)	BDL
19.	Hexavalent Chromium as Cr ⁺ ₆	mg/l	APHA 3500 Cr B	--	BDL
20.	Phenolic Compounds as C ₆ H ₅ OH	mg/l	APHA 5530-B, D	0.001(max)	BDL
21.	Cyanide as CN	mg/l	APHA 4500 CN ⁻ C E	0.05(max)	BDL
22.	Sodium as Na	mg/l	APHA 3500 Na, B	---	10.2
23.	Potassium as K	mg/l	APHA 3500K, B	---	4.8
24.	Copper as Cu	mg/l	APHA 3111 B	0.05(max)	BDL
25.	Iron as Fe	mg/l	APHA 3111 B	1.0(max)	0.46
26.	Manganese as Mn	mg/l	APHA 3111 B	0.1(max)	BDL
27.	Mercury as Hg	mg/l	APHA 3112 B	0.001(max)	BDL
28.	Cadmium as Cd	mg/l	APHA 3111 B	0.003(max)	BDL



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Material Lab
Soil Lab
Mineral Lab
&
Microbiology Lab

29.	Selenium as Se	mg/l	APHA 3500 Se C	0.01(max)	BDL
30.	Arsenic as As	mg/l	APHA 3500 As	0.01(max)	BDL
31.	Lead as Pb	mg/l	APHA 3111 B	0.01(max)	BDL
32.	Zinc as Zn	mg/l	APHA 3111 B	5.0(max)	0.39
33.	Nickel as Ni	mg/l	APHA 3111 B	0.02(max)	BDL
34.	Total Chromium as Cr	mg/l	APHA 3111 B	0.05(max)	BDL
35.	Boron as B	mg/l	APHA 4500 B, B	0.5(max)	BDL
36.	Silver as Ag	mg/l	APHA 3111 B	0.1(max)	BDL
37.	Barium as Ba	mg/l	APHA 3111 B	0.7(max)	BDL
38.	Aluminium as Al	mg/l	APHA 3500 Al B	0.2(max)	BDL
39.	Anionic detergent as MBAS	mg/l	APHA 5540 C	1.0(max)	ND
40.	Mineral Oil	mg/l	APHA 5220 B	0.5(max)	ND
41.	Total Coliform	MPN/100ml	APHA 9221 B	Shall not be detectable in any 100 ml	<1.1
42.	EColi	MPN/100ml	APHA 9221 E	Shall not be detectable in any 100 ml	Absent
43.	Feacal Coliform	MPN/100ml	APHA 9221 F	---	<1.1
44.	Pesticides	mg/l	APHA 6630 C	---	Absent

BDL Value: Cu <0.02mg/l, Al <0.1mg/l, B <0.1mg/l, Ba <0.1mg/l, Mn <0.05mg/l, Hg <0.002 mg/l, Cd <0.01 mg/l, Se <0.001 mg/l, As <0.004 mg/l, Pb <0.01mg/l, Ni <0.05 mg/l, Cr <0.05mg/l, NH₃-N < 0.1mg/l Cr⁶⁺ <0.01mg/l, Phenol <0.05mg/l, CN <0.01mg/l, Ag <0.1mg/l, TC & FC : MPN/100 ml < 1.1 (0-0-0)

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Ref:Envlab/21/R-4825

Date: 06.09.2021

GROUND WATER QUALITY REPORT AUGUST-2021 (BUFFER ZONE)

1. Name of Project : **Manoharpur Open Cast Coal Mine Project**
2. Name of Industry : **Odisha Coal and Power Limited (OCPL), Sundargarh**
3. Name of the Location : **Ground Water-1: Tube well at Paramanandpur Village**
4. Location Co-ordinates : **GW-1: 21° 57' 15.4476" N, 83° 45' 54.144" E**
5. Date of Sampling : **06.08.2021**
6. Date of Receiving : **07.08.2021**
7. Date of Analysis : **07.08.2021 to 16.08.2021**
8. Sample Collected By : **VCSPL Representative**

SL. No.	Name of the Parameters	Unit	Testing Method	Standard as per IS 10500:2012, Amnd. 2015 & 2018(Acceptable Limit)	Analysis Result
					GW-1
1.	pH (at 25 °C)	---	APHA 4500H ⁺ B	6.5-8.5	7.25
2.	Color	Hazen	APHA 2120 B,C	5.0 (max)	<5
3.	Odor	---	APHA 2150 B	Agreeable	Agreeable
4.	Taste	---	APHA 2160 C	Agreeable	Agreeable
5.	Turbidity	NTU	APHA 2130 B	1.0 (max)	<1.0
6.	Residual Free Chlorine	mg/l	APHA:4500 Cl ⁻ B	0.2 (min)	ND
7.	Total Dissolved Solids	mg/l	APHA 2540 C	500.0(max)	281.0
8.	Electrical Conductivity	μS/cm	APHA 2510 C	---	435.2
9.	Total Alkalinity as CaCO ₃	mg/l	APHA 2320 B	200(max)	58.0
10.	Total Hardness as CaCO ₃	mg/l	APHA 2340 C	200(max)	106.0
11.	Calcium as Ca	mg/l	APHA 3500 Ca B	75(max)	33.4
12.	Magnesium as Mg	mg/l	APHA 3500Mg B	30(max)	5.5
13.	Chloride as Cl	mg/l	APHA 4500Cl ⁻ B	250(max)	32.5
14.	Fluoride as F	mg/l	APHA 4500 F ⁻ C, D	1.0(max)	0.19
15.	Sulphide	mg/l	APHA 4500 -S.D	0.05(max)	ND
16.	Sulphate as SO ₄	mg/l	APHA 4500 SO ₄ ⁻ E	200(max)	13.6
17.	Nitrate as NO ₃	mg/l	APHA 4500 NO ₃ ⁻ B	45(max)	1.23
18.	Ammonical Nitrogen as NH ₃ -N	mg/l	APHA 4500 NH ₃ C	0.5(max)	BDL
19.	Hexavalent Chromium as Cr ⁶⁺	mg/l	APHA 3500 Cr B	--	BDL
20.	Phenolic Compounds as C ₆ H ₅ OH	mg/l	APHA 5530-B, D	0.001(max)	BDL
21.	Cyanide as CN	mg/l	APHA 4500 CN ⁻ C E	0.05(max)	BDL
22.	Sodium as Na	mg/l	APHA 3500 Na, B	---	8.4
23.	Potassium as K	mg/l	APHA 3500K, B	---	5.2
24.	Copper as Cu	mg/l	APHA 3111 B	0.05(max)	BDL
25.	Iron as Fe	mg/l	APHA 3111 B	1.0(max)	0.28



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Environment Lab
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Material Lab
Soil Lab
Mineral Lab
&
Microbiology Lab

26.	Manganese as Mn	mg/l	APHA 3111 B	0.1(max)	BDL
27.	Mercury as Hg	mg/l	APHA 3112 B	0.001(max)	BDL
28.	Cadmium as Cd	mg/l	APHA 3111 B	0.003(max)	BDL
29.	Selenium as Se	mg/l	APHA 3500 Se C	0.01(max)	BDL
30.	Arsenic as As	mg/l	APHA 3500 As	0.01(max)	BDL
31.	Lead as Pb	mg/l	APHA 3111 B	0.01(max)	BDL
32.	Zinc as Zn	mg/l	APHA 3111 B	5.0(max)	0.47
33.	Nickel as Ni	mg/l	APHA 3111 B	0.02(max)	BDL
34.	Total Chromium as Cr	mg/l	APHA 3111 B	0.05(max)	BDL
35.	Boron as B	mg/l	APHA 4500 B, B	0.5(max)	BDL
36.	Silver as Ag	mg/l	APHA 3111 B	0.1(max)	BDL
37.	Barium as Ba	mg/l	APHA 3111 B	0.7(max)	BDL
38.	Aluminium as Al	mg/l	APHA 3500 Al B	0.2(max)	BDL
39.	Anionic detergent as MBAS	mg/l	APHA 5540 C	1.0(max)	ND
40.	Mineral Oil	mg/l	APHA 5220 B	0.5(max)	ND
41.	Total Coliform	MPN/100ml	APHA 9221 B	Shall not be detectable in any 100 ml	<1.1
42.	EColi	MPN/100ml	APHA 9221 E	Shall not be detectable in any 100 ml	Absent
43.	Faecal Coliform	MPN/100ml	APHA 9221 F	---	<1.1
44.	Pesticides	mg/l	APHA 6630 C	---	Absent

BDL Value: Cu <0.02mg/l, Al <0.1mg/l, B <0.1mg/l, Ba <0.1mg/l, Mn<0.05mg/l, Hg<0.002 mg/l, Cd <0.01 mg/l, Se <0.001 mg/l, As <0.004 mg/l, Pb<0.01mg/l, Ni<0.05 mg/l, Cr <0.05mg/l, NH₃-N< 0.1mg/l, Cr⁺⁶<0.01mg/l, Phenol <0.05mg/l, CN <0.01mg/l, Ag<0.1mg/l, TC & FC : MPN/100 ml < 1.1 (0-0-0)

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Ref:Envlab/21/R-4826

Date: 06.09.2021

GROUND WATER QUALITY REPORT AUGUST-2021 (BUFFER ZONE)

1. Name of Project : **Manoharpur Open Cast Coal Mine Project**
2. Name of Industry : **Odisha Coal and Power Limited (OCPL), Sundargarh**
3. Name of the Location : **Ground Water-2: Tube Well at Dulanga Village**
4. Location Co-ordinates : **GW-2: 21° 56' 46.1832" N, 83° 47' 55.3164" E**
5. Date of Sampling : **09.08.2021**
6. Date of Receiving : **10.08.2021**
7. Date of Analysis : **10.08.2021 to 18.08.2021**
8. Sample Collected By : **VCSPL Representative**

SL. No.	Name of the Parameters	Unit	Testing Method	Standard as per IS 10500:2012, Amnd. 2015 & 2018 (Acceptable Limit)	Analysis Result
					GW-2
1.	pH (at 25 °C)	---	APHA 4500H ⁺ B	6.5-8.5	7.31
2.	Color	Hazen	APHA 2120 B,C	5.0 (max)	<5
3.	Odor	---	APHA 2150 B	Agreeable	Agreeable
4.	Taste	---	APHA 2160 C	Agreeable	Agreeable
5.	Turbidity	NTU	APHA 2130 B	1.0 (max)	<1.0
6.	Residual Free Chlorine	mg/l	APHA:4500 Cl ⁻ B	0.2 (min)	ND
7.	Total Dissolved Solids	mg/l	APHA 2540 C	500.0(max)	294.0
8.	Electrical Conductivity	μS/cm	APHA 2510 C	---	456.5
9.	Total Alkalinity as CaCO ₃	mg/l	APHA 2320 B	200(max)	64.0
10.	Total Hardness as CaCO ₃	mg/l	APHA 2340 C	200(max)	114.0
11.	Calcium as Ca	mg/l	APHA 3500 Ca B	75(max)	37.2
12.	Magnesium as Mg	mg/l	APHA 3500Mg B	30(max)	5.1
13.	Chloride as Cl	mg/l	APHA 4500Cl ⁻ B	250(max)	36.5
14.	Fluoride as F	mg/l	APHA 4500 F ⁻ C, D	1.0(max)	0.23
15.	Sulphide	mg/l	APHA 4500 -S.D	0.05(max)	ND
16.	Sulphate as SO ₄	mg/l	APHA 4500 SO ₄ ⁻ E	200(max)	15.4
17.	Nitrate as NO ₃	mg/l	APHA 4500 NO ₃ ⁻ B	45(max)	1.14
18.	Ammonical Nitrogen as NH ₃ -N	mg/l	APHA 4500 NH ₃ C	0.5(max)	BDL
19.	Hexavalent Chromium as Cr ⁶⁺	mg/l	APHA 3500 Cr B	--	BDL
20.	Phenolic Compounds as C ₆ H ₅ OH	mg/l	APHA 5530-B, D	0.001(max)	BDL
21.	Cyanide as CN	mg/l	APHA 4500 CN ⁻ C E	0.05(max)	BDL
22.	Sodium as Na	mg/l	APHA 3500 Na, B	---	7.7
23.	Potassium as K	mg/l	APHA 3500K, B	---	5.8
24.	Copper as Cu	mg/l	APHA 3111 B	0.05(max)	BDL
25.	Iron as Fe	mg/l	APHA 3111 B	1.0(max)	0.30
26.	Manganese as Mn	mg/l	APHA 3111 B	0.1(max)	BDL



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Soil Lab
Mineral Lab
&
Microbiology Lab

27.	Mercury as Hg	mg/l	APHA 3112 B	0.001(max)	BDL
28.	Cadmium as Cd	mg/l	APHA 3111 B	0.003(max)	BDL
29.	Selenium as Se	mg/l	APHA 3500 Se C	0.01(max)	BDL
30.	Arsenic as As	mg/l	APHA 3500 As	0.01(max)	BDL
31.	Lead as Pb	mg/l	APHA 3111 B	0.01(max)	BDL
32.	Zinc as Zn	mg/l	APHA 3111 B	5.0(max)	0.49
33.	Nickel as Ni	mg/l	APHA 3111 B	0.02(max)	BDL
34.	Total Chromium as Cr	mg/l	APHA 3111 B	0.05(max)	BDL
35.	Boron as B	mg/l	APHA 4500 B, B	0.5(max)	BDL
36.	Silver as Ag	mg/l	APHA 3111 B	0.1(max)	BDL
37.	Barium as Ba	mg/l	APHA 3111 B	0.7(max)	BDL
38.	Aluminium as Al	mg/l	APHA 3500 Al B	0.2(max)	BDL
39.	Anionic detergent as MBAS	mg/l	APHA 5540 C	1.0(max)	ND
40.	Mineral Oil	mg/l	APHA 5220 B	0.5(max)	ND
41.	Total Coliform	MPN/100ml	APHA 9221 B	Shall not be detectable in any 100 ml	<1.1
42.	EColi	MPN/100ml	APHA 9221 E	Shall not be detectable in any 100 ml	Absent
43.	Feacal Coliform	MPN/100ml	APHA 9221 F	---	<1.1
44.	Pesticides	mg/l	APHA 6630 C	---	Absent

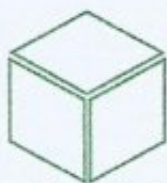
BDL Value: Cu <0.02mg/l, Al <0.1mg/l, B <0.1mg/l, Ba <0.1mg/l, Mn <0.05mg/l, Hg <0.002 mg/l, Cd <0.01 mg/l, Se <0.001 mg/l, As <0.004 mg/l, Pb <0.01mg/l, Ni <0.05 mg/l, Cr <0.05mg/l, NH₃-N < 0.1mg/l, Cr⁺⁶ <0.01mg/l, Phenol <0.05mg/l, CN <0.01mg/l, Ag <0.1mg/l, TC & FC : MPN/100 ml < 1.1 (0-0-0)

Reviewed by



Approved by





Ref: Envlab/21/R-7079

Date: 06.11.2021

ANNEXURE 5

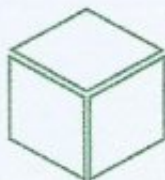
AAQ MONITORING REPORT FOR OCTOBER-2021(CORE ZONE)

1. Name of Project : Manoharpur Open Cast Coal Mine Project
2. Name of Industry : Odisha Coal and Power Limited (OCPL), Sundargarh
3. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550)
4. Sampling Location : AAQMS-1:BGR Office Camp
5. Location Co-ordinates : 21° 56' 57.6996" N, 83° 47' 46.1436" E
6. Sample collected by : VCSPL representative

Date of Monitoring	Sampling duration	Suspended Particulate Matter, SPM ($\mu\text{g}/\text{m}^3$)	Respirable Particulate Matter, PM ₁₀ ($\mu\text{g}/\text{m}^3$)	PM _{2.5} ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)	NO _x ($\mu\text{g}/\text{m}^3$)	CO (mg/m^3)
05.10.2021	24 hrs.	128.0	77.0	43.4	14.3	26.8	0.53
18.10.2021	24 hrs.	146.0	84.0	46.8	15.8	28.2	0.58
As per MoEF & CC Standard Notification no. GSR 742 (E) for Coal mine		500	250	--	120	120	--
NAAQ Standard		--	100.0	60.0	80.0	80.0	4.0 (1hour)
Testing Method		Gravimetric IS 5182: (Part 4) RA 2019	Gravimetric IS 5182: (Part 23) RA 2017	IS 5182 (Part 24) 2019	Improved West & Geake Method IS 5182 (Part-2) RA2017	Modified Jacob & Hochheiser Method IS 5182 (Part-6) RA2017	NDIR Spectroscopy method IS 5182 (Part-10) RA 2019

BDL Values: SO₂ < 4 $\mu\text{g}/\text{m}^3$, NO_x < 9 $\mu\text{g}/\text{m}^3$





Ref: Envlab/21/R-7080

Date: 06.11.2021

AAQ MONITORING REPORT FOR OCTOBER-2021 (CORE ZONE)

1. Name of Project : Manoharpur Open Cast Coal Mine Project
2. Name of Industry : Odisha Coal and Power Limited (OCPL), Sundargarh
3. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550)
4. Sampling Location : AAQMS-2:BGR New Workshop Area
5. Location Co-ordinates : 21° 58' 3.6588" N, 83° 47' 23.5104" E
6. Sample collected by : VCSPL representative

Date of Monitoring	Sampling duration	Suspended Particulate Matter, SPM ($\mu\text{g}/\text{m}^3$)	Respirable Particulate Matter, PM ₁₀ ($\mu\text{g}/\text{m}^3$)	PM _{2.5} ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)	NO _x ($\mu\text{g}/\text{m}^3$)	CO (mg/m^3)
05.10.2021	24 hrs.	141.0	88.0	49.3	15.2	28.1	0.54
18.10.2021	24 hrs.	122.0	74.0	41.7	12.8	25.5	0.49
As per MoEF & CC Standard Notification no. GSR 742 (E) for Coal mine		500	250	--	120	120	--
NAAQ Standard		--	100.0	60.0	80.0	80.0	4.0 (1hour)
Testing Method		Gravimetric IS 5182: (Part 4) RA 2019	Gravimetric IS 5182: (Part 23) RA 2017	IS 5182 (Part 24) 2019	Improved West & Geake Method IS 5182 (Part-2) RA2017	Modified Jacob & Hochheiser Method IS 5182 (Part-6) RA2017	NDIR Spectroscopy method IS 5182 (Part-10) RA 2019

BDL Values: SO₂ < 4 $\mu\text{g}/\text{m}^3$, NO_x < 9 $\mu\text{g}/\text{m}^3$





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• Waste Management Services

Ref:Envlab/21/R-7081

Date: 06.11.2021

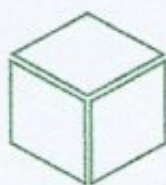
AAQ MONITORING REPORT FOR OCTOBER-2021 (CORE ZONE)

1. Name of Project : Manoharpur Open Cast Coal Mine Project
2. Name of Industry : Odisha Coal and Power Limited (OCPL), Sundargarh
3. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550)
4. Sampling Location : AAQMS-3: CHP OCPL Office
5. Location Co-ordinates : 21° 58' 4.782" N, 83° 47' 56.0616" E
6. Sample collected by : VCSPL representative

Date of Monitoring	Sampling duration	Suspended Particulate Matter, SPM ($\mu\text{g}/\text{m}^3$)	Respirable Particulate Matter, PM ₁₀ ($\mu\text{g}/\text{m}^3$)	PM _{2.5} ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)	NO _x ($\mu\text{g}/\text{m}^3$)	CO (mg/m^3)
06.10.2021	24 hrs.	159.0	92.0	53.0	18.7	29.3	0.56
21.10.2021	24 hrs.	182.0	97.0	56.8	21.2	31.6	0.61
As per MoEF & CC Standard Notification no. GSR 742 (E) for Coal mine		500	250	--	120	120	--
NAAQ Standard		--	100.0	60.0	80.0	80.0	4.0 (1hour)
Testing Method		Gravimetric IS 5182: (Part 4) RA 2019	Gravimetric IS 5182: (Part 23) RA 2017	IS 5182 (Part 24) 2019	Improved West & Geake Method IS 5182 (Part-2) RA2017	Modified Jacob & Hochheiser Method IS 5182 (Part-6) RA2017	NDIR Spectroscopy method IS 5182 (Part-10) RA 2019

BDL Values: SO₂ < 4 $\mu\text{g}/\text{m}^3$, NO_x < 9 $\mu\text{g}/\text{m}^3$





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Environment Lab
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Material Lab
Soil Lab
Mineral Lab
&
Microbiology Lab

Ref: Envlab/21/R-7082

Date: 06.11.2021

AAQ MONITORING REPORT FOR OCTOBER-2021 (CORE ZONE)

1. Name of Project : Manoharpur Open Cast Coal Mine Project
2. Name of Industry : Odisha Coal and Power Limited (OCPL), Sundargarh
3. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550)
4. Sampling Location : AAQMS-4:OCPL Mines Area
5. Location Co-ordinates : 21° 57' 48.1284" N, 83° 46' 55.6068" E
6. Sample collected by : VCSPL representative

Date of Monitoring	Sampling duration	Suspended Particulate Matter, SPM ($\mu\text{g}/\text{m}^3$)	Respirable Particulate Matter, PM ₁₀ ($\mu\text{g}/\text{m}^3$)	PM _{2.5} ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)	NO _x ($\mu\text{g}/\text{m}^3$)	CO (mg/m ³)
06.10.2021	24 hrs.	192.0	99.0	57.3	24.7	33.2	0.71
21.10.2021	24 hrs.	170.0	94.0	54.4	21.3	29.6	0.64
As per MoEF & CC Standard Notification no. GSR 742 (E) for Coal mine		500	250	--	120	120	--
NAAQ Standard		--	100.0	60.0	80.0	80.0	4.0 (1hour)
Testing Method		Gravimetric IS 5182: (Part 4) RA 2019	Gravimetric IS 5182: (Part 23) RA 2017	IS 5182 (Part 24) 2019	Improved West & Geake Method IS 5182 (Part-2) RA 2017	Modified Jacob & Hochheiser Method IS 5182 (Part-6) RA 2017	NDIR Spectroscopy method IS 5182 (Part-10) RA 2019

BDL Values: SO₂ < 4 $\mu\text{g}/\text{m}^3$, NO_x < 9 $\mu\text{g}/\text{m}^3$





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• Waste Management Services

Laboratory Services
Environment Lab
Food Lab
Material Lab
Soil Lab
Mineral Lab
&
Microbiology Lab

Ref: Envlab/21/R-7083

Date: 06.11.2021

AAQ MONITORING REPORT FOR OCTOBER-2021 (BUFFER ZONE)

1. Name of Project : Manoharpur Open Cast Coal Mine Project
2. Name of Industry : Odisha Coal and Power Limited (OCPL), Sundargarh
3. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550)
4. Sampling Location : AAQMS-1:Dulanga Village
5. Location Co-ordinates : 21° 56' 46.2372" N, 83° 47' 54.9456" E
6. Sample collected by : VCSPL representative

Date of Monitoring	Sampling duration	Suspended Particulate Matter, SPM ($\mu\text{g}/\text{m}^3$)	Respirable Particulate Matter, PM ₁₀ ($\mu\text{g}/\text{m}^3$)	PM _{2.5} ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)	NO _x ($\mu\text{g}/\text{m}^3$)	CO (mg/m ³)
12.10.2021	24 hrs.	117.0	70.0	39.5	15.4	27.3	0.29
26.10.2021	24 hrs.	129.0	77.0	33.7	13.6	24.4	0.37
NAAQ Standard		--	100.0	60.0	80.0	80.0	4.0 (1hour)
Testing Method		Gravimetric IS 5182: (Part 4) RA 2019	Gravimetric IS 5182: (Part 23) RA 2017	IS 5182 (Part 24) 2019	Improved West & Geake Method IS 5182 (Part-2) RA2017	Modified Jacob & Hochheiser Method IS 5182 (Part-6) RA2017	NDIR Spectroscopy method IS 5182 (Part-10) RA 2019

BDL Values: SO₂ < 4 $\mu\text{g}/\text{m}^3$, NO_x < 9 $\mu\text{g}/\text{m}^3$





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Laboratory Services
Environment Lab
Food Lab
Material Lab
Soil Lab
Mineral Lab
&
Microbiology Lab

Ref: Envlab/21/R-7084

Date: 06.11.2021

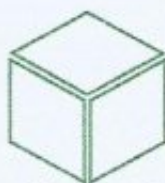
AAQ MONITORING REPORT FOR OCTOBER-2021 (BUFFER ZONE)

1. Name of Project : Manoharpur Open Cast Coal Mine Project
2. Name of Industry : Odisha Coal and Power Limited (OCPL), Sundargarh
3. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550)
4. Sampling Location : AAQMS-2: Kalamegha Village
5. Location Co-ordinates : 21° 56' 55.5288" N, 83° 50' 33.9036" E
6. Sample collected by : VCSPL representative

Date of Monitoring	Sampling duration	Suspended Particulate Matter, SPM ($\mu\text{g}/\text{m}^3$)	Respirable Particulate Matter, PM ₁₀ ($\mu\text{g}/\text{m}^3$)	PM _{2.5} ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)	NO _x ($\mu\text{g}/\text{m}^3$)	CO (mg/m ³)
11.10.2021	24 hrs.	114.0	69.0	29.6	12.3	21.7	0.35
25.10.2021	24 hrs.	108.0	66.0	34.4	13.1	22.3	0.42
NAAQ Standard		--	100.0	60.0	80.0	80.0	4.0 (1hour)
Testing Method		Gravimetric IS 5182: (Part 4) RA 2019	Gravimetric IS 5182: (Part 23) RA 2017	IS 5182 (Part 24) 2019	Improved West & Geake Method IS 5182 (Part-2) RA 2017	Modified Jacob & Hochheiser Method IS 5182 (Part-6) RA 2017	NDIR Spectroscopy method IS 5182 (Part-10) RA 2019

BDL Values: SO₂ < 4 $\mu\text{g}/\text{m}^3$, NO_x < 9 $\mu\text{g}/\text{m}^3$





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Environment Lab
Food Lab
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Soil Lab
Mineral Lab
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Microbiology Lab

Ref:Envlab/21/R-7085

Date: 06.11.2021

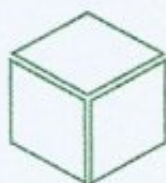
AAQ MONITORING REPORT FOR OCTOBER-2021 (BUFFER ZONE)

1. Name of Project : Manoharpur Open Cast Coal Mine Project
2. Name of Industry : Odisha Coal and Power Limited (OCPL), Sundargarh
3. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550)
4. Sampling Location : AAQMS-3:Paramanandpur Village
5. Location Co-ordinates : 21° 57' 15.7464" N, 83° 45' 54.8172" E
6. Sample collected by : VCSPL representative

Date of Monitoring	Sampling duration	Suspended Particulate Matter, SPM ($\mu\text{g}/\text{m}^3$)	Respirable Particulate Matter, PM ₁₀ ($\mu\text{g}/\text{m}^3$)	PM _{2.5} ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)	NO _x ($\mu\text{g}/\text{m}^3$)	CO (mg/m^3)
11.10.2021	24 hrs.	107.0	65.0	36.6	13.8	23.4	0.33
25.10.2021	24 hrs.	118.0	73.0	29.8	15.3	26.1	0.36
NAAQ Standard		--	100.0	60.0	80.0	80.0	4.0 (1hour)
Testing Method		Gravimetric IS 5182: (Part 4) RA 2019	Gravimetric IS 5182: (Part 23) RA 2017	IS 5182 (Part 24)2019	Improved West & Geake Method IS 5182 (Part-2) RA2017	Modified Jacob & Hochheiser Method IS 5182 (Part-6) RA2017	NDIR Spectroscopy method IS 5182 (Part-10) RA 2019

• BDL Values: SO₂ < 4 $\mu\text{g}/\text{m}^3$, NO_x < 9 $\mu\text{g}/\text{m}^3$





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Soil Lab
Mineral Lab
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Microbiology Lab

Ref:Envlab/21/R-7086

Date: 06.11.2021

AAQ MONITORING REPORT FOR OCTOBER-2021 (BUFFER ZONE)

1. Name of Project : Manoharpur Open Cast Coal Mine Project
2. Name of Industry : Odisha Coal and Power Limited (OCPL), Sundargarh
3. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550)
4. Sampling Location : AAQMS-4: Kiripsira Village
5. Location Co-ordinates : 21° 59' 22.6788" N, 83° 46' 47.2368" E
6. Sample collected by : VCSPL representative

Date of Monitoring	Sampling duration	Suspended Particulate Matter, SPM ($\mu\text{g}/\text{m}^3$)	Respirable Particulate Matter, PM ₁₀ ($\mu\text{g}/\text{m}^3$)	PM _{2.5} ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)	NO _x ($\mu\text{g}/\text{m}^3$)	CO (mg/m ³)
12.10.2021	24 hrs.	115.0	70.0	35.1	16.2	25.5	0.34
26.10.2021	24 hrs.	124.0	76.0	29.3	14.7	22.8	0.31
NAAQ Standard		--	100.0	60.0	80.0	80.0	4.0 (1hour)
Testing Method		Gravimetric IS 5182: (Part 4) RA 2019	Gravimetric IS 5182: (Part 23) RA 2017	IS 5182 (Part 24) 2019	Improved West & Geake Method IS 5182 (Part-2) RA2017	Modified Jacob & Hochheiser Method IS 5182 (Part-6) RA2017	NDIR Spectroscopy method IS 5182 (Part-10) RA 2019

BDL Values: SO₂ < 4 $\mu\text{g}/\text{m}^3$, NO_x < 9 $\mu\text{g}/\text{m}^3$





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● Mineral/Sub-Soil Exploration
● Waste Management Services

Ref: Envlab/21/R-7093

Date: 06.11.2021

ANNEXURE 6

NOISE MONITORING REPORT OCTOBER-2021

1. Name of Project : Manoharpur Open Cast Coal Mine Project
2. Name of Industry : Odisha Coal and Power Limited (OCPL), Sundargarh

Location ID	Date of Recording	Location	Location Co-ordinates	Day time Equivalent Noise Level in dB(A) leq	Night time Equivalent
CORE ZONE					
N-1	05.10.2021	BGR Office Camp	21° 56' 57.6996" N, 83° 47' 46.1436" E	61.4	49.7
N-2	05.10.2021	BGR New Workshop Area	21° 58' 3.6588" N 83° 47' 23.5104" E	65.8	48.8
N-3	21.10.2021	CHPL OCPL Office	21° 58' 4.782" N 83° 47' 56.0616" E	69.2	50.5
N-4	21.10.2021	OCPL Mines Area	21° 57' 48.1284" N 83° 46' 55.6068" E	73.3	56.2
BUFFER ZONE					
N-5	26.10.2021	Dulanga Village	21° 56' 46.2372" N 83° 47' 54.9456" E	53.6	40.2
N-6	11.10.2021	Kalamegha Village	21° 56' 55.5288" N 83° 50' 33.9036" E	50.4	37.8
N-7	11.10.2021	Paramanandpur Village	21° 57' 15.7464" N 83° 45' 54.8172" E	51.8	38.6
N-8	26.10.2021	Kiripsira Village	21° 59' 22.6788" N 83° 46' 47.2368" E	49.6	36.4
Standard as per CPCB	Industrial Area			75	70
	Residential Area			55	45

