South Eastern Coalfields Limited

Office of the Sub Area Manager
Rajgamar Sub Area
PO: Rajgamar Colliery: Distt. Korba(C..)

No. SECL/KA/Raj./C/SAM/Envt./Safeguards/ 216 Date: 02.01.2018

APCCF
Sct-D
Sct-C
To-(F)
Asst.....
12 JAN 2018

To,
Shri Kanwarjit Singh, APCCF(C)
Ministry of Environment, Forest and Climate Change,
Regional Office (WCZ), Ground Floor East Wing,
New Secretariat Building,
Civil Line, Nagpur – 44001 (M.H.)
Mob. No. – 94440810026

10267

Sub : Submission of Half yearly Compliance Report of E.C. conditions (Environmental Safe Guard) for the period ending December 2017

Six monthly Compliance Report

Ref.:SECL/GM/Kb/Envt./.

Dear Sir,

Enclose please find herewith the Environmental Safe Guard, Half yearly report for the period ending December'2017, along with the following details :

1. Monitoring Report of ground water level and quality of wells exist in the villages around 10km from Rajgamar vp-1 to10
2. Information to concerned panchayat with a copy of Env. Clearance letter.vp-11 to 15
3. Expenditure statement for Revenue works related to Env.vp- 16
4. Monitoring report by CMPDIL for Air,Noise,and Effluent of Apr-2017 to Aug-2017Submitted for your kind perusal and necessary action please.vp-17 to 41
5. Monitoring report by CMPDI for , drinking water for the quarter ending June'2017vp-42 to 46
6. Environment audit statement 2016-17vp-47 to 54
7. Application for obtaining N.O.C.for ground water withdrawl and utilization.vp-55 to 66.

Yours faithfully,

Encl. : As above.

Dy.G.M..(M)/SAM
Rajgamar Sub Area.
2/1/18

Copy to :

1. The Member Secretary,
Chhattisgarh Environment
Conservation Board,
Paryawas Bhawan, Sector – 19,
New Raipur (Chhattisgarh) PIN- 492 101.
2. Regional Officer, CECB, Korba.
3. General Manager, SECL, Korba Area.
4. Staff Officer(Project & Planning), SECL, Korba Area.
5. Area Nodal Officer(Envt.), SECL, Korba Area.
6. In-charge (Civil), Rajgamar .

02/01/2018

MONITORING THE IMPLEMENTATION OF ENVIRONMENTAL SAFEGUARDS
FOR THE PERIOD ENDING DEC'2017

PART – I

(General Particulars)

1. Name of the Project	: Rajgamar Project. Korba Area, SECL.
2. No. & Date of MOEF Clearance letter	: OM. No.J –11015/165/2005-IA.II (M) dtd.18-5-2006.
3. Area involved in the project and breakup purpose wise, if any (in hectares)	: Mining Right Forest Land - 1994.121 Ha. Govt. Land - 6.305 Ha. Tenancy land - 1486.151 Ha. Total - 3486.577 Ha.
4. Location	: North Eastern Part of Korba, Dist. Korba, Chhattisgarh State. Lat-22^0 -22'-15" Long-82^0 -52'-05"
5. (a) Production approved per annum by MoEF	: 0.45 MTY.
(b) Production achieved during last Financial year (2016-2017)	: **Total Production 74925 Te.** (i.e. from April'2016 to March'2017)
(c) Production achieved during Financial Year 2017-18	: 57063 Te. (April 2017 to December 2017)

PART-II

1. Present Status incl. Work Progress	: Extraction is being done.
2. Total manpower and civic amenities including free fuel distribution for labor force during construction phase	: 756 (as on 31.12.17) : Free LPG cylinder is supplied to each worker .
3. Project cost original	: Rs 32.25 crores
4. Financial allocation for environmental	: Capital Rs.20.75 lakhs (as per approved EMP) safeguards
5.Monitoring cell established Yes/No. if any Details If no, give reasons.	: Envt Deptt. Setup at Area & Sub Area level. 1. Nodal officer (Envt) at Area level 2. C.M, (C) / Envt at Sub Area level.
6. How regularly /Quarterly/Six monthly	: Six monthly, report submitted to MoEF. Progress reports are submitted to the ministry
7. Fire fighting system/Emergency plan Details	: Fire extinguishers have been provided at all the reqd. points. Emergency plan for mine has been established.

24/01/18

PART-III

(Rehabilitation/Reclamation/ Restoration Programme)

1. No .of families/persons displaced : Nil

2. Rehabilitation site identified : Not applicable

Area (Ha)	Year	Civic amenities to be provided	Families shifted
---------- Not Applicable ----------			

3. No of displaced persons/families employed : Not applicable

   Quantity of solid waste /OB produced/day or/ any year wise : Nil

   Location and total area to be reclaimed / restored : Not applicable

4. Plan for reclaiming the excavated areas/ Quarry sites and borrow pits through filling/ Leveling/stabilization of the exposed slopes : Not applicable

5. The year wise financial allocation for rehabilitation /reclamation/restoration : Not applicable

6. The phase program of expenditure for Rehabilitation/reclamation/restoration already incurred/future. : Not applicable

PART- IV

(Pollution Control Measures)

1. Facilities provided to collect industrial waste water and sewage. : Settling tank has been constructed for mine Water. One No. rapid gravity water treatment plant has been installed of 0.5 MGD Capacity for drinking water supply to mine and near by villages Soak pit & Septic tank in colony qtrs.

2. Quantity /day discharged industrial waste water/ domestic, point of discharge & location map. : 3850 kl/day

3. Monitoring of treated effluent frequency No. of sampling points. : Frequency - Fortnightly
   : Sampling points – 3. (Effluent)
   Sampling points – 2. (Drinking water

4. Air quality analysis & its Monitoring frequency, No. of station : Frequency – Fortnightly
   : Sampling station - 3 in core and 1 in Monitoring buffer zone.

5. Noise pollution monitoring stations : Frequency – Fortnightly
   : Sampling station – 3 in core and 1 in buffer zone, Monitoring results enclosed separately

04/01/18

6. Preventive measures for Air, Noise and water : i) Spraying of water
(ii) Avenue plantation
(iii) Green Belt formation completed
(iv) Before discharging water to surface the pumped water is passed through settling tank
(v) Black topping of roads
(vi) Bunker covered with CGI sheets & water sprayed at all transfer points.

7. a) Financial allocation capital/revenue : The capital budget for Envt. Control measure as per EMP is Rs. 20.75 lacs.

b) Expenditure done till December' 2017. : Recurring ₹9.8lacs

Capital Rs. Nil.

PART - V

(Green Belt & afforestations, etc.)

Year	Target	Achievement	Density/Ha	Species
1986	6000	6000	2500	Teak, Nilgiri, Peltaform
1987	8000	8000	2500	Gulmohar, Sirus,Sisum, Neem
1988	10000	10000	2500	-do-
1989	26200	26200	2500	-do-
1990	19153	19153	2500	-do-
1991	16365	16365	2500	-do-
1992	Nil	Nil	2500	-do-
1993	Nil	Nil	2500	-do-
1994	Nil	Nil	2500	-do-
1995	10500	10500	2500	-do-
1996	20000	20000	2500	-do-
1997	25000	25000	2500	-do-
1998	Nil	Nil	2500	-do-
1999	5000	5000	2500	-do-

1. Financial (features) allocation : Rs. Nil for this period 2016-17.

2. Present condition of plantation. : Growth of plantation Satisfactory (80% Survival)

02/01/18

Part VI

COMPLIANCE STATUS OF CONDITIONS IMPOSED IN APPROVED EMP OF RAJGAMAR U/G OF KORBA AREA.

Rajgamar UG

<table>
<tr><th>Sl No</th><th>(A) Specific Conditions</th><th>Compliance Status</th></tr>
<tr><td>i</td><td>Mining shall not be carried in forestland for which forestry clearance has not been obtained under the provisions of FC Act, 1980.</td><td>The mine has obtained forest land clearance (1st stage /2nd stage are as followed
<table>
<tr><th>Sl. No</th><th>Particulars</th><th>Area</th><th>Approval Nos.</th><th>Remarks</th></tr>
<tr><td>1</td><td>For Road</td><td>31.978 Ha.</td><td>5/257/76/2dtd.24.11.76</td><td>Having final clearance</td></tr>
<tr><td>2.</td><td>For Magazine</td><td>1.149 Ha.</td><td>3/257/76/10/2dtd. 30.4.79</td><td>-do-</td></tr>
<tr><td>3.</td><td>Rly. Siding</td><td>55.847 Ha.</td><td>6167/5/23/10/3/79dtd.9.10.79</td><td>-do-</td></tr>
<tr><td>4.</td><td>Office Buildings & Colony</td><td>151.652 Ha.</td><td>6629/6910/3/79 dtd.24.11.79</td><td>-do-</td></tr>
<tr><td>5.</td><td>Portable Magazine</td><td>0.973 Ha.</td><td>5/109/92/1013 dtd.9.6.93</td><td>-do-</td></tr>
<tr><td>6.</td><td>For Office Buildings & Mine Entries</td><td>20.0 Ha.</td><td>6-CHC 007/2006-BHO/2254 dtd.8.1.07</td><td>1st clearance obtain</td></tr>
<tr><td>7.</td><td>For Mine Entries & approach road</td><td>2.32 Ha.</td><td>8C/6/423/97-FCW/201 dtd.24.1.02</td><td>Final clearance</td></tr>
<tr><td>8.</td><td>For U/G Rights</td><td>461.80 Ha.</td><td>8-103/2005-FC dtd.14.3.06</td><td>1st stage</td></tr>
<tr><td>9.</td><td>For U/G Rights</td><td>419.34 Ha.</td><td>8-103/2005-FC (Vol-1) dtd. 13.07.11</td><td>1st stage</td></tr>
</table></td></tr>
<tr><td>ii</td><td>Sufficient coal pillars shall be left unrestricted around the air shaft (within the subsidence influence area) to protect from any damage from subsidence etc.</td><td>Sufficient coal pillars have been left to protect from any damage from subsidence etc.</td></tr>
<tr><td>iii</td><td>Solid barriers shall be left below the roads falling within the blocks to avoid any damage to the roads.</td><td>As per DGMS Stipulation coal pillars width of 45 mtrs. Have been left to support the road over the surface.</td></tr>
<tr><td>iv</td><td>No depillaring operation shall be carried out below villages and other surface structures.</td><td>No depillaring operation has been done below villages so far and will be followed in future.</td></tr>
</table>

24.1.18

V	Depression due to subsidence resulting in water accumulating within the low lying areas .	3-D numerical modeling of the mine has been carried out by CMRI, Dhanbad and regular subsidence monitoring is being done by the project to identify and quantify subsidence. No major subsidence takes place so far due to depillaring operation. Hence no water accumulation within low lying areas. If required the depression cracks of subsidence area will be filled up by dozing with earth as recommended in the report of CMRI (enclosed).
vi	While extracting Panels in the lower seam, all water bodies in the subsidence area shall be drained. Dewatering of the old goaves of the upper seam shall be continued as long as the lower seam is worked to prevent accumulation of large water bodies over working area.	Not applicable, as only one seam namely R-II being working in this project.
Vii	Regular monitoring of subsidence movement on the surface over and around the working area and impact on natural drainage pattern, water bodies, vegetation, structure, roads, and surroundings should be continued till movement ceases completely. In case of observation of any high rate of subsidence movement, appropriate effective corrective measures should be taken to avoid loss of life and material, Cracks should be effectively plugged with ballast and clay soil/suitable material.	The depillaring operation is being carried in this project since 1981. Subsidence monitoring over depillaring area are being done on routine basis as per coal mine reg. 1957. No high rate subsidence observed so far. If observed corrective measures like crack filling by earth/ballast will be done.
viii	Garland/surface drains (size, gradient and length) around the safety area such as mine shaft and low lying areas and sump capacity should be deigned keeping 50% safety margin over an above the peak sudden rainfall and maximum discharge in the area adjoining the mine sites. Sump capacity should also provide adequate retention period to allow proper settling of silt material. Sufficient number of pumps of adequate capacity shall be deployed to pump out mine water during peak rainfall.	Garland/surface drains provided along mine shaft for safety purpose and regularly cleaned. Sufficient capacity of sump is present in the mine to deal the make of water in peak season. Sump cleaning is being done on routine basis to maintain its capacity.
ix	Crushers at the CHP should be operated with high efficiency bag filters, water sprinkling system should be provided to check fugitive emissions from crushing operations, conveyor system, haulage roads, transfer points, etc.	No crushing of coal is being practiced as only bunkers have been provided. Sufficient water spraying arrangement has been made at strategic points along with enclosure for bunkers, conveyor belts etc.
x	Drills should be wet operated.	Wet drilling is not required as the mine is very watery and strata contain sufficient water.

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Xi	Controlled blasting should be practiced with use of delay detonators.	Blasting is being done as per stipulation of DGMS and CMRI 1957. Explosive used of type power Gel (P-1 and P-5). Ordinary and Delay detonator are used.
xii	A progressive a forestation plan shall be prepared and implemented for the undisturbed area and shall include area brought under green belt development, areas along roads, infrastructure over surface where mining is being done below, along ML boundary and township outside the lease area, etc, by planting native species in consultation with the local, DFO/Agriculture Department. The density of the trees should be around 2500 plants per ha.	Future progressive a forestation plan has been given in EMP in page VI-4. Plantation has already been done along roads, infrastructure over surface near mine entries, colonies, filter plant etc. as shown in the plan. Total 1,46,218 nos. has been planted till date in this project. There are various species planted like, Mango, Hara, Gulmohar, Sisum, Sirus, Neem etc.
xiii	Conservation plan for endangered species found in and around the project area shall be formulated in consultation with the State Forest and Wildlife Departments.	The mine is an underground mine hence doesn't have a significant impact on the flora and fauna over the surface. The conservation plan and flora fauna survey report prepared by Dr. S.C. Jena, Retd. Principal Chief Conservator of Forest, C.G. Raipur had been submitted with March'2008 report.
Xiv	Regular monitoring of groundwater level and quality should be carried out by establishing a network of existing wells and construction of new pelzometers. The monitoring for quantity should 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 should be submitted to the Ministry of Environment & Forest and to the Central Pollution Control Board quarterly within one month of monitoring.	Ground water level and quality monitoring is being done as per given schedule in nearby village wells and in the project also. (Copy enclosed).
xv	The Company shall put up artificial groundwater recharge measure for augmentation of groundwater resource. The project authorities should meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.	The mine water is being supplied to the nearby villages(after treatment) for irrigation of land which also recharges the ground water level. However the nearby villages are provided with treated water for drinking purpose through SECL pipe line as per Community Development programmed.
xvi	The company shall obtain approval of CGWA/CGWB Regional Office for use of groundwater if any, for mining operations.	We are in process of obtaining approval of CGWA/CGWB Regional office Raipur for withdrawl and utilization of ground water.applied vide no. 317 dt.20.12.17
xvii	Sewage treatment plant should be installed in the existing colony. ETP should also be provided for workshop and CHP wastewater.	Septic tank and soak-pit arrangement has been provided in existing colonies for domestic sewage treatment. There is no CHP and no waste water is generated from workshop also. Hence ETP is not provided.

07/01/18

Xviii	Digital processing of the entire lease area using remove sensing technique should be done regularly once in 3 years for monitoring land use pattern and report submitted to MoEF and its Regional Officer at Bhopal.	The work of digital processing of the lease area has been issued to CMPDIL, Ranchi as per given schedule.
xix	A Final Mine Closure Plan along with details of corpus fund should be submitted to the Ministry of Environment & Forest 5 Years in advance of final mine closure for approval.	A progressive mine plan has approved in the 227TH meeting of SECL Board on 30.08.2014. The mine is in operation and the final mine closure plan shall be prepared 5 years prior to the closure of mine.
xx	Consent to Operate shall be obtained before expanding mining operations.	Consent has been granted by CECB up to 30.4.2020 vide No.6751 & 6749/TS/CECB/ 2017 NAYA Raipur dtd.30.03.2017
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 Forest.	To be followed. Agreed to the condition.
ii	No change in the calendar plan including excavation, quantum if mineral coal and waste should be made.	To be followed. Agreed to the condition.
iii	Four ambient air quality monitoring stations should 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.	The ambient air quality is being monitored at 4 locations in the core buffer zone. The SPM, RPM, SO2 & NOX parameters are being regularly monitored by CMPDIL on fortnightly basis The location of ambient air points are- **a.** Rajgamar 6&7 incline. **b.** Rajgamar 4&5 incline. **c.** SAM Office **d.** Colony. The locations are shown, in the enclosed plan along with the report. (copy enclosed).
Iv	Data on ambient air quality (SPM, RPM, SO2 and Nox) should be regularly submitted to Ministry including its Regional Office at Bhopal and to the State Pollution Control Board and the Central Pollution Control Board once in six months.	The reports are being submitted to Regional Office MoEF, Bhopal, CECB, Raipur and Regional Office CECB, Korba.
v.	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, and dump trucks (loading and unloading) points should be provided and properly maintained.	Water spraying is being done at all loading/unloading points, coal transportation roads etc. The ambient air quality monitoring station (Rajgamar 6&7 and Rajgamar 4&5) are location at around 50m distance from the bunkers, which is the chief source of fugitive dust emission. The SPM and RPM values are within limit.

02/01/18

Vi	Adequate measure 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.	Adequate measures like the enclose for bunker belt conveyor, belt drive head has been provided to counter noise pollution Ear muff/Ear plug has been provided to the workers engaged in drilling/blasting operation.
vii	Industrial wastewater (workshop and wastewater from the mine) should be properly collected, treated so as to conform to the standards proscribed 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.	Settling tank has been provided. No effluent is generated in workshop.
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.	Vehicles engaged for transport of coal are required to submit the PUC certificate issued from State Govt. Compulsorily. Transporting truck are optimally loaded and covered with tarpaulins.
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.	Environment laboratory with adequate instruments is established at Kusmunda and bilaspur by CMPDIL,.
x.	Personnel working in dust 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 taken corrective measures if needed.	The workers are given regular training for health and safety. All the workers are medically examined under PME programme. Dust mask are provided to the workers working in dust prone areas.
xi	A separate environmental management cell with suitable qualified personnel should be set up under the control of Senior Executive, who will report directly to the Head of the company.	Environment cell at Area Hq., Korba.
xii	The fund earmarked for environmental protection measures should be 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.	Fund has already been ear- marked for environment protection measures as given in page IX-1 in chapter-IX . Year wise expenditure is sent with six monthly status report.

02/01/18

xiii	The Regional Office of this Ministry located at Bhopal shall monitor compliance of the stipulated conditions. The Project Authority shall extend full co-operation to the officer(s) of the Regional Office by the furnishing the requisite data/information/ monitoring reports.	Will be complied.
xiv	A copy of the clearance letter will be marked to the concerned Panchayat/Local NGO, if any from whom any suggestion/representation has been received while processing the proposal.	Copy of compliance letter has been sent to concerned panchayat vide no.249 dt 1.8.17
xv	State Pollution Control Board should display a copy of the clearance letter at the Regional Office, District Industry Centre and Collector's Office/Tehsildars Office for 30 days.	Related with Chhattisgarh Environment Pollution Control Board.
xvi	The Project Authority should advertise at least in two local newspapers widely circulated 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 & Forest at http://envfor.nic.in.	Complied.

1. The Ministry or any other competent Authority may stipulate any further condition for environmental protection.
2. 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.
3. The above condition will be enforced *inter-area*, under the provision of the Water (Prevention & control of pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1991, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and Rules.

2/1/18 2.1.18 2/1/18

Chief Manager (M)/SAM
Rajgamar U/G Mine.

Dy. Manager (Survey)
Rajgamar U/G Mine

In-charge (C)/Nodal Officer(Envt.)
Rajgamar U/G Mine.

02/01/2018.

साउथ ईस्टर्न कोलफील्ड्स लिमिटेड
(मिनी रत्न कंपनी)
(कोल इंडिया लिमिटेड की सहायक कम्पनी)
CIN: U10102CT1985GO1003161
कार्यालय महाप्रबंधक, कोरबा क्षेत्र
पो0आ0–कोरबा कॉलरी
जिला–कोरबा छ0ग0 495677

SOUTH EASTERN COALFIELDS LIMITED
(A MINI RATAN COMPANY)
(A SUBSIDIARY OF COAL INDIA LIMITED)
CIN: U10102CT1985GO1003161
OFFICE OF THE GENERAL MANAGER
KORBA AREA
P.O. – KORBA COLLIERY
DISTT. – KORBA, C.G. 495677

64

पत्र कं0:– एसईसीएल/जीएम/कोरबा/पर्या0/17/
Ref No.: SECL/GM/KB/Envt/17/ 317

दिनॉक: /12/2017
Date: 20/12/2017

To,

The Regional Director
Central Ground Water Board
North Central Chhattisgarh Region
Raipur-492001

Sub: Application for obtaining NOC for ground water withdrawal and utilization for M/s Rajgamar Underground Coal Mine, S.E.C.L.
Ref: Online application no. 21-4/637/CT/MIN/2017 dtd. 19.12.2017

Dear Sir,

For seeking kind permission for withdrawal and utilization of groundwater by M/s Rajgamar Underground Coal Mine, S.E.C.L., the application has been loaded vide no. 21-4/637/CT/MIN/2017 dtd. 19.12.2017. The hard copy of the application duly signed by the applicant along with the uploaded annexes is hereby being submitted for kind necessary action.

Encl.: As above.

Yours faithfully,

19/12/17

General Manager
S.E.C.L. Korba Area

Copy to: 1. General Manager(Envt), S.E.C.L. Bilaspur- for kind information please.
2. Sub-Area Manager, S.E.C.L. Rajgamar Sub Area.
3. Nodal Officer(Envt.), S.E.C.L. Korba Area

20.12.17

(28)

(63)

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

Application for Permission to Dewater Ground Water for Mining Industry (Application for New NOC)

Application Number : 21-4/637/CT/MIN/2017

1.	**General Information:**	
	Water Quality:	Fresh Water
	Whether Ground Water Utilization for:	Existing Industry
	Date of Commencement Mine/Project:	01/02/1974
	Date of Expansion:	
	Application Type Category/ Type of Application	Coal
2.	**Name of Mine/Project:**	M/S RAJGAMAR UNDERGROUND COAL MINE S.E.C.L.
3.	**Location Details of the Mining Unit- (Attach Site, Approved Mining Plan, Toposketch of Surrounding 10km Radius Outside) ($) :**	
	Address Line 1 :	OFFICE OF THE SUB AREA MANAGER, RAJGAMAR UNDERGROUND COAL MINE, P.O. RAJGAMAR COLLIERY, DISTT. KORBA
	Address Line 2 :	
	Address Line 3 :	
	State:	CHHATTISGARH
	District:	KORBA
	Sub-District:	KORBA
	Village/Town:	Rajgamar (CT)
	Area Type :	Non-Notified
	Area Type Category :	Safe
4.	**Communication Address**	
	Address Line 1:	OFFICE OF THE SUB AREA MANAGER, RAJGAMAR UNDERGROUND COAL MINE, P.O. RAJGAMAR COLLIERY, DISTT. KORBA
	Address Line 2:	
	Address Line 3:	
	State:	CHHATTISGARH
	District:	KORBA
	Sub-District:	KORBA
	Pincode:	495683
	Phone Number with Area Code:	
	Mobile Number:	91 9425533116
	Fax Number:	
	E-Mail:	aeokorbasecl@rediffmail.com
5.	**Salient Features of the Activity:**	
	Rajgamar underground coal mine of S.E.C.L. has a licensed annual production capacity of 0.45 MT, for which the mine has obtained EC from MoEFCC and CTE and CTO from CECB Raipur. The method of production is Bord and Pillar development/ depillaring by caving method with SDL.	
6.	**Land Use Details of the Surroundings (km 10 Radius – Outside): ($)**	

20/12/17 07/01/18

(28)
(62)

Application for Permission to Dewater Ground Water for Mining Industry (Application for New NOC)

Application Number : 21-4/637/CT/MIN/2017

	Land Use Details of the Surroundings(km 10 radius):	As per the EIA study, the land use classification within the 10 km buffer zone of the project area as per the census data of 1991 is: Forest area: 34860.85 Ha Irrigated agricultural area: 76.05 Ha Non-irrigated agricultural area: 7666.50 Ha Cultivable waste land: 1382.98 Ha Area not available for cultivation: 5652.25 Ha Total:49638.63 Ha

7. Land Use Detail of Project Area

	Land Use Details	Existing (sq meter)	Proposed (sq meter)	Grand Total (sq meter)
	Green Belt Area			0
	Open Land			0
	Road/ Paved Area			0
	Rooftop area of building/ sheds			0
	Total			0

8.	**Topography of the Area**		
	a)	**Regional**	Rolling plain country
	b)	**Project Area**	Topography of the area is a rolling plain country with elevations ranging from 308 m to 346 m above MSL and gradually rises to an elevation of about 450 m, a few miles outside east of the block. However, RL of the mine varies between 300 m to 340 m.
9.	**Drainage in the Area (River / Nala etc)**		
	a)	**Regional**	The drainage is predominantly dendritic in nature. Hasdeo River is the master drainage of the area.
	b)	**Project Area**	The mine area is drained by the east-west flowing Phulkadih Nala and Gorma Nala. These streams join with Dhengur Nala which ultimately reaches Hasdeo River in west.
10.	**Source of Availability of Surface Water – Furnish Details ($):**		Phulkadih Nala, Dhengur Nala and Gorma Nala are surface water sources. However, the domestic and dust suppression needs of the project are met through mine water supply.
11.	**Average Annual Rainfall in the Area (in mm):**		1356.00
12.	**Townships/Villages within 10 km radius of the Project:**		Tilaidand,Patibahar,Gorma,Kerakachhar,Darga,Madanpur, Batati,Geraon,Patrapali,Thakurketa,Chhuidhoda,Mauhar, Kerwa,Tawanara,Kesala,Rajgamar,Dumardih,Jhagarha,B hulsidih,Dhengurdih,Korkoma,Bundeli,Karumauha,Mudhu nara,Matmar,Parsakhola,Gahaniya,Tapra,Bhatgaon,Chuiy a,Sonpuri,Saraipali,Bela,Jambahar,Rogbahri,Dondro,Rum gara,Risda,Risdi,Kharmora,Naktikhar,Dhelwadih,Rapakha rra,Godhi,Pandripani,Bendarkona,Chakamar, Bhelwater,Anchhimar,Karmandi,Sakdukalan,Basinkhar,Ga ngdei, Amadand,Newadih

20/12/17

07/01/18

Application for Permission to Dewater Ground Water for Mining Industry (Application for New NOC)

Application Number : 21-4/637/CT/MIN/2017

13.	Whether the Groundwater Table will be Intersected by Activity :-		Yes	
	(a)	At What Depth (m bgl)	Pre-monsoon	Post-monsoon
		Minimum (m bgl)	3.18	1.59
		Maximum (m bgl)	11.87	10.90
	(b)	Maximum Depth Proposed to Dewater (m bgl)	11.87	
	(c)	Groundwater Flow Direction (Attach Map)($)	North-west	
	(d)	Any Other Information	NA	
14.	Total Water Requirment for various Purpose to be Mentioned		(m3/day)	(m3/year)
	Ground Water Required through Abstract Structure		21.60	7884.00
	Ground Water Abstracted on account of Dewatering / Mining Seepage		5000.00	1825000.00
	Total Ground Water Withdrawal		5021.60	1832884.00
15.	Details of De-Watering Structure			
	(a)	De-Watering Existing Structure		
	Number of Existing Structures:		15	

SNo.	Type of Structure Name / Year of Construction	Depth (Meter) / Diameter (mm)	Depth to Water Level (Meters below Ground Level)	Discharge (m3/Hour)	Operational Hours(Day) / Days (Year)	Mode of Lift Name	Horse Power of Pump	Whether fitted with Water Meter	Whether Permission Registered with CGWA /If so Details Thereof
1	Mine Pumps / -	- / -		144.56	- / -	Centrifugal Pump		No	No / -
2	Mine Pumps / -	- / -		147.29	- / -	Centrifugal Pump		No	No / -
3	Mine Pumps / -	- / -		136.38	- / -	Centrifugal Pump		No	No / -
4	Mine Pumps / -	- / -		139.11	- / -	Centrifugal Pump		No	No / -
5	Mine Pumps / -	- / -		141.83	- / -	Centrifugal Pump		No	No / -
6	Mine Pumps / -	- / -		136.38	- / -	Centrifugal Pump		No	No / -
7	Mine Pumps / -	- / -		136.38	- / -	Centrifugal Pump		No	No / -
8	Mine Pumps / -	- / -		136.38	- / -	Centrifugal Pump		No	No / -
9	Mine Pumps / -	- / -		147.29	- / -	Centrifugal Pump		No	No / -
10	Mine Pumps / -	- / -		147.29	- / -	Centrifugal Pump		No	No / -
11	Mine Pumps / -	- / -		136.38	- / -	Centrifugal Pump		No	No / -
12	Mine Pumps / -	- / -		147.29	- / -	Centrifugal Pump		No	No / -

(26)

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Application for Permission to Dewater Ground Water for Mining Industry (Application for New NOC)

Application Number : 21-4/637/CT/MIN/2017

		13	Mine Pumps / -	- / -		144.56	- / -	Centrifugal Pump		No	No / -
		14	Mine Pumps / -	- / -		141.83	- / -	Centrifugal Pump		No	No / -
		15	Mine Pumps / -	- / -		139.11	- / -	Centrifugal Pump		No	No / -

(b) De-Watering Requirment and Proposed Structure Detail

Number of Proposed Structures: 1

SNo.	Type of Structure Name / Year of Construction	Depth (Meter) / Diameter (mm)	Depth to Water Level (Meters below Ground Level)	Discharge (m3/Hour)	Operational Hours(Day) / Days(Year)	Mode of Lift Name	Horse Power of Pump	Whether fitted with Water Meter	Whether Permission Registered with CGWA/If so Details Thereof
1	Tubewell / 2019	- / -		3.60	6 / 365	Submersible Pump		No	No / -

16. Proposed Utilization of Pumped Water (Please Attach Details)(m3/year) ($)

(a)	Domestic Use in Mines	328500.00	900 KLD treated mine water is supplied for domestic use to project colony and nearby localities.
(b)	Water Supply		
(c)	Agriculture	1405250.00	3850 KLD balance mine water is supplied for irrigation purpose to nearby agricultural fields.
(d)	Green Belt Development		
(e)	Suppression of Dust	91250.00	250 KLD mine water is utilized for dust suppression.
(f)	Recharge		
(g)	Any Other Item		

17. Monitoring of Ground Water Regime (Attach Map($))

(a)	Location Details of the Wells / Piezometers (Latitute, Longitude, Reduced Level)	Location of Wells - Gorma (22.418 N, 82.842 E), Kesla (22.409 N, 82.816 E), Gangdei(22.394 N, 82.799 E), Basinkhar(22.391 N, 82.784 E), Kerakachar(22.399 N, 82.883 E), Rajgamar(22.392 N, 82.845 E), Tevanara (22.419 N, 82.857 E), Thakurkheta(22.438 N, 82.852 E), Newadih(22.444 N, 82.851 E), Patrapali(22.454 N, 82.849 E),Chhuhidhora(22.377 N, 82.825 E), Amadand(22.378 N, 82.821 E), Dengurdih(22.357 N, 82.838 E), Korkoma (22.353 N, 82.872)
(b)	Number of Wells / Piezometers	Monitoring of ground water level is done in 27 nos.of wells in 14 nearby villages.
(c)	Attach Details of GW Level of Observation Wells / Piezometers(At Least fo. One Year)($)	Attached.
(d)	Number of Wells / Piezometers Proposed to Monitor	Monitoring is already being done in 27 nos. of wells. No new wells/piezometers are proposed for moni
(e)	Number of Piezometers Proposed to Monitor to Construct in Surroundings	Nil.

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Application for Permission to Dewater Ground Water for Mining Industry (Application for New NOC)

Application Number : 21-4/637/CT/MIN/2017

(f)	General Quality of GW in the Area & Surroundings ($)	Groundwater quality monitoring is being done on quarterly basis at 14 wells. Report attached.
(g)	Any Other Item	No.

18. Proposed Pump / Pumping Groundwater Outside the Mine Pit for Domestic or Other Use (If so, give Details):

Number of Existing Structures: 15

SNo.	Type of Structure Name / Year of Construction	Depth (Meter) / Diameter (mm)	Depth to Water Level (Meters below Ground Level)	Discharge (m3/Hour)	Operational Hours (Day) / Days (Year)	Mode of Lift Name	Horse Power of Pump	Whether fitted with Water Meter	Whether Permission Registered with CGWA/If so Details Thereof
1	Mine Pumps / -	- / -		144.56	- / -	Centrifugal Pump		No	No / -
2	Mine Pumps / -	- / -		147.29	- / -	Centrifugal Pump		No	No / -
3	Mine Pumps / -	- / -		136.38	- / -	Centrifugal Pump		No	No / -
4	Mine Pumps / -	- / -		139.11	- / -	Centrifugal Pump		No	No / -
5	Mine Pumps / -	- / -		141.83	- / -	Centrifugal Pump		No	No / -
6	Mine Pumps / -	- / -		136.38	- / -	Centrifugal Pump		No	No / -
7	Mine Pumps / -	- / -		136.38	- / -	Centrifugal Pump		No	No / -
8	Mine Pumps / -	- / -		136.38	- / -	Centrifugal Pump		No	No / -
9	Mine Pumps / -	- / -		147.29	- / -	Centrifugal Pump		No	No / -
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11	Mine Pumps / -	- / -		136.38	- / -	Centrifugal Pump		No	No / -
12	Mine Pumps / -	- / -		147.29	- / -	Centrifugal Pump		No	No / -
13	Mine Pumps / -	- / -		144.56	- / -	Centrifugal Pump		No	No / -
14	Mine Pumps / -	- / -		141.83	- / -	Centrifugal Pump		No	No / -
15	Mine Pumps / -	- / -		139.11	- / -	Centrifugal Pump		No	No / -

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Application for Permission to Dewater Ground Water for Mining Industry (Application for New NOC)

Application Number : 21-4/637/CT/MIN/2017

	Number of Proposed Structures:					1					
		SNo.	Type of Structure Name / Year of Construction	Depth (Meter) / Diameter (mm)	Depth to Water Level (Meters below Ground Level)	Discharge (m3/Hour)	Operational Hours (Day) / Days (Year)	Mode of Lift Name	Horse Power of Pump	Whether fitted with Water Meter	Whether Permission Registered with CGWA/If so Details Thereof
		1	Tubewell / 2019	- / -		3.60	6 / 365	Submersible Pump		No	No / -

19. Groundwater Availability Report (Please Enclose a Comprehensive Report / Note on Groundwater Condition / Groundwater Quality in and Around 5Km of the Area) - ($)

Groundwater level monitoring is being carried out at 27 wells in 14 villages and quality monitoring at 14 wells(reports are attached).
Further as per EIA report, due to development of impermeable beds in the roof the impact of underground mining on phreatic aquifer is marginal and the radius of influence is limited to small distance.The zone of impact due to mining will vary from minimum 173 m to maximum 776 m from the mine. With sufficient recharge from nearby Nalas the impact is negligible.

20. Details of Rainwater Harvesting and Artificial Recharge Measures for Groundwater Recharge in the Area. If the Firm has Proposed to take up Rainwater Harvesting and Recharge outside the Premises, then provide NOC from the concern Authority / Agency where the Harvesting Measures are Proposed, if already implemented, Details may be furnished. (Attach Report on Comprehensive & Feasible Rainwater Harvesting / Recharge Proposal).- ($)

Rajgamar underground mine of SECL is watery in nature. 5000KL mine water is pumped out per day out of which after utilization in domestic needs and dust suppression measures, balance mine water of 3850 KLD is supplied to nearby villages as per demand for irrigation in their agricultural fields. The standing water column in agricultural fields also acts as groundwater recharge.

21. Copy of Referral Letter seeking NOC from CGWA from Central Pollution Control Board / State Pollution Control Board / Bureau of Indian Standards / Ministry of Environment and Forests / Other Central / State Agencies shall be Annexed.- ($)

Attached Referral Letter

S.No	Attached Referral Letter	Attachment Name	File Name
1	Ministry of Environment and Forests	REFERRAL LETTER	REFERRAL LETTER.pdf

Have you Applied Earlier for the Same Purpose with CGWA / State Ground Water Authority:

If Yes, so Details thereof with Status:

MINING USE- Self Declaration

☑ It is to Certify that the Data and Information Furnished Above are True to the Best of My Knowledge and Belief and I am Aware that if any Part of the Data / Information Submitted is Found to be False or Misleading at any Stage the Application will be Rejected Out Rightly.

1. Application Proforma is subject to modification from time to time.

2. Application should be submitted to Regional Office.

Regional Director,Central Ground Water Board North Central Chhattisgarh, Reena Apartment, 2nd Floor, NH 43, Dhamtari Road, Panchpedi Naka, RAIPUR, CHHATTISGARH, 492001

3. Incomplete Application will be Summarily Rejected.

Submitted Application will not be Processed till the Print Out of the Signed Complete Application is Submitted to Regional Office.

Application for Permission to Dewater Ground Water for Mining Industry (Application for New NOC)

Application Number : 21-4/637/CT/MIN/2017

4. Applicant has to Submit Processing Fee of Rs. 1000.00/- (Rupees One Thousand Only) through NON TAX RECEIPT PORTAL (https://bharatkosh.gov.in). A receipt will be generated. Please fill in the Transaction Ref No. and Date from the receipt, in print out of application and attach receipt along with hard copy of application.

Bharatkosh Details:-

Transaction Ref Number:-	2012170000222
Dated:-	20.12.2017

Note:- The Processing Fee is Non-Refundable. Applicant should ensure and Check Eligibility of Submission of Application and Required Documents before Submitting Online Application.

Attached Files:

1). Site Plan : (Refer 3)

S.No	Attachment Name	File Name
1	SITE PLAN CUM MINING PLAN	SITE PLAN CUM MINING PLAN.pdf

2). Approved Mining Plan : (Refer:3)

S.No	Attachment Name	File Name
1	SITE PLAN CUM MINING PLAN	SITE PLAN CUM MINING PLAN.pdf

3). Toposketch of Surroundings 10 km Radius Outside : (Refer: 3)

No Attachment Found!

4). Document of Ownership of the land : (Refer-7)

No Attachment Found!

5). Source of Availability of Surface Water : (Refer-10)

S.No	Attachment Name	File Name
1	DRAINAGE MAP	DRAINAGE MAP.jpg

6). GroundWater flow Direction Map : (Refer: 13-C)

No Attachment Found!

7). Proposed Utilization of Pumped Water : (Refer: 16)

S.No	Attachment Name	File Name
1	FLOW CHART SHOWING UTILIZATION OF PUMPED MINE WATE	FLOW CHART SHOWING UTILIZATION OF PUMPED MINE WATER .pdf

8). Monitoring of Groundwater Regime Map : (Refer: 17)

No Attachment Found!

9). GW Level of Observation Wells / Piezometer : (Refer: 17-C)

S.No	Attachment Name	File Name
1	WELL WATER READINGS	WELL WATER READINGS.pdf

10). General Quality of Ground Water in the Area : (Refer: 17-f)

(22)
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Application for Permission to Dewater Ground Water for Mining Industry (Application for New NOC)

Application Number : 21-4/637/CT/MIN/2017

S.No	Attachment Name	File Name
1	GENERAL QUALITY OF GROUNWATER IN SURROUNDING AREAS	GENERAL QUALITY OF GROUNDWATER IN THE SURROUNDING AREAS.pdf

11). Groundwater Availability Report : (Refer: 19)

No Attachment Found!

12). Details of Rainwater Harvesting and Artificial Recharge Measures : (Refer: 20)

S.No	Attachment Name	File Name
1	NOTE ON GROUNDWATER RECHARGE	NOTE ON GROUNDWATER RECHARGE.jpg

13). Authorization :

No Attachment Found!

15). Extra Attachment :

No Attachment Found!

16). Scanned Mining Application :

No Attachment Found!

Date :

Place :

Name & Signature of the applicant

20.12.17

उप महाप्रबंधक/ अधि.क्षे. (official seal)
Dy. General Manager/S.A.M.
रजगामार उप क्षेत्र, कोरबा क्षेत्र
Rajgamar Sub Area, KORBA Area

20/12/17

Associated User : SECLKORBA
Submitted By User : SECLKORBA
Submission Date : 19/12/2017

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

21/12/17

(21) (55)

bharatkosh.gov.in
Government of India Receipt Portal

RECEIPT

Transaction Ref.No. 2012170000222 Dated: Dec 20 2017 10:26AM

Received from MS./MRS. YAMINI SINGH with Transaction Ref.No. 2012170000222

Dated Dec 20 2017 10:26AM the sum of INR 1000 (One Thousand Only) through Internet based

Online payment in the account of PROCESSING FEE OF FRESH NOC FOR GROUND WATER EXTRACTION, , .

Disclaimer:- This is a system generated electronic receipt, hence no physical signature is required for the purpose of authentication

Printed On: 20-12-2017 10:26:51

Courtesy :- Controller General of Accounts

20/12/17

20/01/18

cmpdi

A Mini-Ratna Company

ENVIRONMENTAL AUDIT STATEMENT

RAJGAMAR UNDERGROUND MINE

(KORBA AREA)

2016 - 2017

SOUTH EASTERN COALFIELDS LIMITED

(A Mini Ratna Company)

Central Mine Planning & Design Institute Limited
Regional Institute – V, SECL Complex,
BILASPUR (C.G.)

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ENVIRONMENTAL AUDIT STATEMENT

For

RAJGAMAR UNDERGROUND MINE

Under

(KORBA AREA)

South Eastern Coalfields Limited

(A Mini Ratna Company)

Year of establishment - 1974

Capacity of Mine: 0.45 MTPA

Project Area - 3486.57 Ha. (Total Lease)

Central Mine Planning & Design Institute Limited

Regional Institute – V

SECL Complex, Post Box No. 22

BILASPUR (C.G.)

02/01/18

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ENVIRONMENT AUDIT STATEMENT 2016-17

RAJGAMAR UNDER GROUND MINE

CHAPTER – I

TABLE – 1.1

1.0	General Information		: Rajgamar UG Mine, Distt.- Korba (C.G.).
	Name of Area		: Korba Area.
	a) Extractable Reserves (01.04.20147)		: 6&7 Incline– 2.760 MT,4&5 Incline–3.45MT
	b) Target output & grade of coal (17-18)		: Rajgamar 4&5 Incline – 1, 10,000 Tonnes Rajgamar 6&7 Incline – 0 Tonnes (Target) Grade B (LF)
	c) Seams Worked		: R-II Seam
	d) Thickness of Seam Worked (in mtrs.)		: 1.40 – 2.95 m
	e) Depth of Seams from the Surface	i) Minimum :	17.00 m
		ii) Maximum :	164.00 m
	f) Av. Stripping ratio mining purpose	:	N.A.
	g) No. of villages/families	:	N.A.
	h) i) Mining area (in Ha.)	:	Rajgamar 4&5 Incline – 1515 Ha Rajgamar 6&7 Incline – 589 Ha
	ii) Leasehold area other mining purpose (in Ha.)	:	
	iii) Total Leasehold Area	:	3486.57 Ha

30/01/18

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1.1 **Brief Geology of Mine:**

Rajgamar Area is a rolling plain country. A large part of the area is covered by dense forest of sal and recent plantation of teak. The area is drained by Phulkadih stream in easterly direction south of Rajgamar to Hasdeo River. The stream has a perennial flow of water which is reduced considerably during the summer months. The minor tributaries of this stream dry up during the summer months.

1.1 **Mining Method Description:**

Rajgamar 6&7 Incline: Bord & Pillar development/depillaring by caving method with SDL (not running).

Rajgamar 4&5 Incline: Bord & Pillar development/ depillaring by caving method with SDL.

1.3 **Present Status of The Mine:**

1. Production Figures:

Year	Coal Production
2013-14	1,90,800 Tonnes
2014-15	2,11,000 Tonnes
2015-16	1,09,340 Tonnes
2016-17	75,925 Tonnes
2017-18(Target)	1,00,000 Tonnes

2. No. of Inclines : 6 nos (4&5 Incline & Main Incline, 6,7 &10 Incline)

3. Shafts : 02 (ven shaft 01 no. at Rajgamar 6&7)
(ven shaft 01 no. at Rajgamar 4&5)

4. No. of quarries : N.A.

5. Overburden : N.A.

6. Main Consumers : local sponge iron plants and cement factories.

7. Mode of dispatch : Road dispatch through trucks

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CHAPTER-II

FORM-V

(See rule 14)

Environmental Statement for the Financial Year Ending

31st March 2016

PART-A

i) Name and address of the mine	:	Rajgamar Sub Area P.O. - Rajgamar Colliery Dist. - Korba (C.G.) Pin – 495683.
ii) Industry category Primary (SIC Code) or Secondary (SIC Code)	:	Primary
iii) Production capacity units	:	0.45 MTY
iv) Year of establishment	:	Rajgamar Colliery – 1974 a) Original CS – 5(12)/1974 b) Revised CPP – 43011/8/82 Dated - 31/10/1983.
v) Date of the last environmental Statement Submitted.	:	September 2016

02/01/18

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PART-B

Water and Raw Materials Consumption

(i) Water Consumption (KLD)

Industrial	250 KLD
Domestic	900 KLD

Name of Products	Process water consumption per product output	
	During the previous financial year 2015-16	During the current financial year 2016-17
Coal	N.A.	

(ii) Raw materials consumption

*Name of raw materials	Name of products	Consumption of raw material per unit of output	
		During the previous financial year 2015-16	During the current financial year 2016-17
Explosive	Coal	0.82 kg/tonne	0.79 kg/tonne
P.O.L	Coal	0.35 lit/tonne	0.20 lit/tonne

*Industry may use codes if disclosing details of raw materials would violate contractual obligations, otherwise all industries have to name the raw materials used.

PART-C

POLLUTANT DISCHARGED TO ENVIRONMENT/UNIT OF OUTPUT

(Parameters as specified in the consent issued)

Pollutants (Including mine & colony discharge of water)	Quantity of pollutants discharged KLD	Concentrations of pollutants in discharge KLD	Percentage of variation from prescribed standards with reasons
Air	Not Quantified	Within Permissible Limits	Within Permissible Limits
Water 1.Mine water pumped out, 2.Industrial water discharged 3.Colony water discharged	3850 KLD		
Noise	Not Quantified		

Conclusion:

As per the environmental monitoring of air, water and noise report of mine, the discharge pollutant concentrations are well within the permissible limit as per coal mine standards.

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PART-D
(Hazardous Wastes)
(As specified under Hazardous Wastes/Management Handling Rule, 1989)

Hazardous Wastes	Total quantity (Kg)	
	During the previous financial year 2015-16	During the current financial year 2016-17
From Process	NIL	NIL
From Pollution control facilities	NIL	NIL

Neither liquid nor solid hazardous wastes is generated during underground coal mining.

PART-E
SOLID WASTES

Removal of overburden	Total quantity	
	During the previous financial year 2015-16	During the current financial year 2016-17
Total O.B.	N.A. for UG Mine	
Total O.B. For back filling		
Total O.B. disposed		

PART-F

Please specify the characterization (in terms of composition and quantum) of hazardous as well as solid wastes and indicate disposal practice adopted for both these categories of wastes.

Description	Qty. MT / Year(16-17)	Collection Method
Steel Scrap	Not Applicable	Not Applicable
Copper Scrap		
Aluminium Scrap		
Used Oil		

PART-G

Impact of the pollution abatement measure taken on conservation of natural resources and on the cost of production.

NIL

02/01/18

PART-H

Additional measures/investment proposals for environmental protection including abatement of pollution, prevention of pollution.

- Settling tank are cleaned regularly.
- Mine water of 4&5 incline is being re-circulated to water filter plant for domestic use.
- Sprinkling arrangement for dust suppression in 6&7 incline of Rajgamar U.G.

PART-I

Any other particulars for improving the quality of the environment.

- Rapid gravity filter plant commissioned for drinking water supply to colonies.

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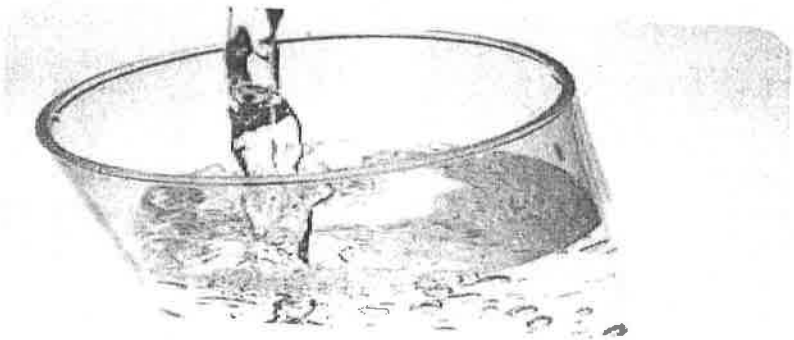
A Mini-Ratna Company

ENVIRONMENTAL MONITORING REPORT

DRINKING WATER

(KORBA AREA)



QUARTER ENDING JUNE - 2017

SOUTH EASTERN COALFIELDS LIMITED

(A Mini Ratna Company)

Central Mine Planning & Design Institute Limited
Regional Institute – V, SECL Complex,
BILASPUR (C.G.)

Drinking Water Analysis Report
April- June 2017

CONTENT

CENTRAL MINE PLANNING AND DESIGN
INSTITUTE LIMITED Regional Institute-V
Bilaspur, C attisgar

CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED

Environment Laboratory, Regional Institute-V

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A Mini-Ratna Company

SECL Complex, Seepat Road
Bilaspur (C.G.)- 495 006
Phone: (07752) 246371
email: amit.saxena@coalindia.in; mr.singh@coalindia.in

DRINKING WATER ANALYSIS REPORT

Month	April	2017	Area	Korba	Report No.	AP17KB
Customer	South Eastern Coalfields Ltd (SECL), Bilaspur				Date of Issue	21 July 2017
Project	Rajgamar UG		Sample Ref. No.		CMPDI/ENV/KSM/2017/09/849, Dated:04/04/2017	
Sampling Stations	10	Treated Water of Rajgamar Filter Plant			Date of Sampling	03 April 2017
	11	Drinking Water from Main Shaft /Main Incline			Date of Sampling	03 April 2017 to 14 June 2017

Sl. No.	Parameter	Method of Analysis	Date of Analysis		IS 10500: 2012		Uncertainty of Measurement (at 95% Confidence Level & K= 1.96)
			Observed Values		Acceptable Limit	Permissible Limit in the Absence of Alternate Source	
			10	11			
1	Colour, Hazen LDL: 1.0 Hazen	APHA, 22nd Edition, 2120. C, Spectrometric single wavelength Method	BDL	1	5	15	±0.22 Hazen at 4.778 Hazen
2	Odour	IS 3025 (Part 5):1983, (RA 2012) Physical (Qualitative)	Agreeable	Agreeable	Agreeable	Agreeable	None
3	Turbidity, NTU LDL: 1.0 NTU	IS 3025 (Part 10):1984, RA 2006, Nephelometric Method	4.31	3.1	1	5	±0.085 NTU at 0.944 NTU
4	pH LDL: 3.00	IS 3025 (Part 11):1983, (RA 2006), Electrometric Method	6.22	6.54	6.5-8.5	No relaxation	±0.127 at 7.0074
5	Alkalinity, mg/l as $CaCO_3$ LDL: 5.0 mg/l	IS 3025(Part 23):1986,(RA 2003) Titration Method	50	40	200	600	±0.19696 mg/l at 10 mg/l
6	Total Hardness, mg/l as $CaCO_3$ LDL: 4.0 mg/l	IS 3025 (Part 21):2009, EDTA Method	52	54	200	600	±11.54 mg/l at 612.8 mg/l
7	Iron, mg/l LDL: 0.06 mg/l	IS 3025 (Part 53) :2003: (RA 2009) AAS-Flame Method	BDL	BDL	0.3	No relaxation	±0.0036 mg/l at 0.061 mg/l
8	Chlorides, mg/l LDL: 0.5 mg/l	IS 3025(Part 32):1988 , (RA 2007), Argentometric Method	10	9.5	250	1000	±6.55 mg/l at 253.46 mg/l
9	Residual Free Chlorine, mg/l LDL: 0.02 mg/l	APHA, 22nd Edition, 4500G, DPD Colorimetric Method	0.03	0.03	0.2	1	±0.0082 mg/l at 0.177 mg/l
10	Total Dissolved Solids, mg/l LDL: 30.0 mg/l	IS 3025 (Part 16):1984 (RA 2006), Gravimetric Method	134	134	500	2000	±4.47 mg/l at 592.0 mg/l
11	Calcium, mg/l LDL: 2.0 mg/l	IS 3025 (Part 40): 1991, (RA 2009), EDTA Method	16.8	16	75	200	±2.51 mg/l at 99.74 mg/l
12	Copper, mg/l LDL: 0.03 mg/l	IS 3025 (Part 42) : 1992 (RA 2009), AAS-Flame Method	BDL	BDL	0.05	1.5	±0.13 mg/l at 4.895 mg/l
13	Manganese, mg/l LDL: 0.02 mg/l	IS 3025 (Part 59) : 2006, AAS-Flame Method	BDL	BDL	0.1	0.3	±0.0259 mg/l at 2.4423 mg/l
14	Sulphate, mg/l LDL: 2.0 mg/l	APHA, 22nd Edition, 4500- SO_4^{2-} E Turbidimetric Method	12	12	200	400	±0.64 mg/l at 19.88 mg/l
15	Nitrate, mg/l LDL: 0.5 mg/l	APHA, 22nd Edition, 4500, B UV-Spectrophotometric Method	BDL	1.25	45	No relaxation	±0.528 mg/l at 20.406 mg/l
16	Fluoride, mg/l LDL: 0.02 mg/l	APHA, 22nd Edition, 4500, F D SPADNS Method	0.11	0.2	1	1.5	±0.014 mg/l at 0.976 mg/l
17	Selenium, mg/l LDL: 0.002 mg/l	IS 3025 (Part 56):2003 AAS- VGA Method	BDL	BDL	0.01	No relaxation	±0.81 µg/l at 18.4 µg/l
18	Arsenic, mg/l LDL: 0.002 mg/l	IS 3025 (Part 37):1988(RA 2003) AAS- VGA Method	BDL	BDL	0.01	0.05	±0.81 µg/l at 18.4 µg/l
19	Lead, mg/l LDL: 0.005 mg/l	APHA, 22nd Edition, 3113B, AAS-GTA Method	BDL	BDL	0.01	No relaxation	±0.266 µg/l at 5.098 µg/l
20	Zinc, mg/l LDL: 0.01 mg/l	IS 3025 (Part 49) : 1994, (RA: 2009) AAS-Flame Method	0.02	0.02	5	15	±0.001 mg/l at 0.011 mg/l
21	Hexavalent Chromium, mg/l LDL: 0.01 mg/l	APHA, 22nd Edition, 3500 Cr^{6+} B Colorimetric Method	0.02	0.02	0.05	No relaxation	±0.001 mg/l at 0.0978 mg/l
22	Fecal Coliform, MPN/100 ml	APHA, 22nd Edition, 9221 Multiple Tube Fermentation Tech.	Nil	Nil	Nil	No relaxation	---
23	Boron, mg/l LDL: 0.2 mg/l	APHA, 22nd Edition, 4500-B, Carmine Method	BDL	BDL	0.5	1	±0.06 mg/l at 1.1096 mg/l
24	Phenolic compounds, mg/l LDL: 0.002 mg/l	APHA, 22nd Edition, 5530. C, Chloroform Extraction Method	BDL	BDL	0.001	0.002	±0.0204 mg/l at 0.1004 mg/l

LDL indicates Lower Detection Limit & BDL indicates Below Detection Limit

M. Reagan Singh
Lab Coordinator

K.K. Dhirbi
Lab-in-charge

Prabhat Kumar
Junior Scientific Asst.

Note: 1)The results above relate to the samples tested as received.
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02/01/18

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DRINKING WATER ANALYSIS REPORT

Month	May 2017	Area	Korba	Report No.	MY17KB
Customer	South Eastern Coalfields Ltd (SECL), Bilaspur			Date of Issue	20 July 2017
Project	Rajgamar UG		Sample Ref. No.	CMPDI/ENV/KSM/2017/09/887, Dated:03/05/2017	
Sampling Stations	10	Treated Water of Rajgamar Filter Plant		Date of Sampling	02 May 2017
	11	Drinking Water from Main Shaft /Main Incline		Date of Sampling	02 May 2017

Sl. No.	Parameter	Method of Analysis	Date of Analysis		02 May 2017	to	27 June 2017
			Observed Values		IS 10500: 2012		Uncertainty of Measurement (at 95% Confidence Level & K= 1.96)
			10	11	Acceptable Limit	Permissible Limit in the Absence of Alternate Source	
1	Colour, Hazen LDL: 1.0 Hazen	APHA, 22nd Edition, 2120 C, Spectrometric single wavelength Method	BDL	BDL	5	15	±0.22 Hazen at 4.778 Hazen
2	Odour	IS 3025 (Part 5):1983, (RA 2012) Physical (Qualitative)	Agreeable	Agreeable	Agreeable	Agreeable	None
3	Turbidity, NTU LDL: 1.0 NTU	IS 3025 (Part 10):1984, RA 2006, Nephelometric Method	2.31	2.14	1	5	±0.085 NTU at 0.944 NTU
4	pH LDL: 3.00	IS 3025 (Part 11):1983, (RA 2006), Electrometric Method	6.69	6.71	6.5-8.5	No relaxation	±0.127 at 7.0074
5	Alkalinity, mg/l as $CaCO_3$ LDL: 5.0 mg/l	IS 3025(Part 23):1986,(RA 2003) Titration Method	36	40.5	200	600	±0.19696 mg/l at 10 mg/l
6	Total Hardness, mg/l as $CaCO_3$ LDL: 4.0 mg/l	IS 3025 (Part 21):2009, EDTA Method	33	21	200	600	±11.54 mg/l at 612.8 mg/l
7	Iron, mg/l LDL: 0.06 mg/l	IS 3025 (Part 53) :2003: (RA 2009) AAS-Flame Method	BDL	BDL	0.3	No relaxation	±0.0036 mg/l at 0.061 mg/l
8	Chlorides, mg/l LDL: 0.5 mg/l	IS 3025(Part 32):1988, (RA 2007), Argentometric Method	13.5	13.5	250	1000	±6.55 mg/l at 253.46 mg/l
9	Residual Free Chlorine, mg/l LDL: 0.02 mg/l	APHA, 22nd Edition, 4500G, DPD Colorimetric Method	0.02	0.03	0.2	1	±0.0082 mg/l at 0.177 mg/l
10	Total Dissolved Solids, mg/l LDL: 30.0 mg/l	IS 3025 (Part 16):1984 (RA 2006), Gravimetric Method	76	82	500	2000	±4.47 mg/l at 592.0 mg/l
11	Calcium, mg/l LDL: 2.0 mg/l	IS 3025 (Part 40): 1991, (RA 2009), EDTA Method	25.6	16	75	200	±2.51 mg/l at 99.74 mg/l
12	Copper, mg/l LDL: 0.03 mg/l	IS 3025 (Part 42) : 1992 (RA 2009), AAS-Flame Method	BDL	BDL	0.05	1.5	±0.13 mg/l at 4.895 mg/l
13	Manganese, mg/l LDL: 0.02 mg/l	IS 3025 (Part 59) : 2006, AAS-Flame Method	BDL	BDL	0.1	0.3	±0.0259 mg/l at 2.4423 mg/l
14	Sulphate, mg/l LDL: 2.0 mg/l	APHA, 22nd Edition, 4500- SO_4^{2-} E Turbidimetric Method	40.18	46.91	200	400	±0.64 mg/l at 19.88 mg/l
15	Nitrate, mg/l LDL: 0.5 mg/l	APHA, 22nd Edition, 4500, B UV-Spectrophotometric Method	1.47	1.53	45	No relaxation	±0.528 mg/l at 20.406 mg/l
16	Fluoride, mg/l LDL: 0.02 mg/l	APHA, 22nd Edition, 4500, F D SPADNS Method	BDL	BDL	1	1.5	±0.014 mg/l at 0.976 mg/l
17	Selenium, mg/l LDL: 0.002 mg/l	IS 3025 (Part 56):2003 AAS- VGA Method	BDL	BDL	0.01	No relaxation	±0.81 µg/l at 18.4 µg/l
18	Arsenic, mg/l LDL: 0.002 mg/l	IS 3025 (Part 37):1988(RA 2003) AAS- VGA Method	BDL	BDL	0.01	0.05	±0.81 µg/l at 18.4 µg/l
19	Lead, mg/l LDL: 0.005 mg/l	APHA, 22nd Edition, 3113B, AAS-ETA Method	BDL	BDL	0.01	No relaxation	±0.266 µg/l at 5.098 µg/l
20	Zinc, mg/l LDL: 0.01 mg/l	IS 3025 (Part 49) : 1994, (RA: 2009) AAS-Flame Method	BDL	BDL	5	15	±0.001 mg/l at 0.011 mg/l
21	Hexavalent Chromium, mg/l LDL: 0.01 mg/l	APHA, 22nd Edition, 3500 Cr^{6+} B Colorimetric Method	BDL	BDL	0.05	No relaxation	±0.001 mg/l at 0.0978 mg/l
22	Fecal Coliform, MPN/100 ml	APHA, 22nd Edition, 9221 Multiple Tube Fermentation Tech.	Nil	Nil	Nil	No relaxation	---
23	Boron, mg/l LDL: 0.2 mg/l	APHA, 22nd Edition, 4500-B, Carmine Method	BDL	BDL	0.5	1	±0.06 mg/l at 1.1096 mg/l
24	Phenolic compounds, mg/l LDL: 0.002 mg/l	APHA, 22nd Edition, 5530 C, Chloroform Extraction Method	BDL	BDL	0.001	0.002	±0.0204 mg/l at 0.1004 mg/l

LDL indicates Lower Detection Limit & BDL indicates Below Detection Limit

Deepanwita Bin
Junior Scientific Asst.

K.K. Dhirhi
Lab-in-charge

M. Reagan Singh
Lab Coordinator

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Environment Laboratory, Regional Institute-V

DRINKING WATER ANALYSIS REPORT

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Phone: (07752) 246371
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Month	June	2017	Area	Korba	Report No.	JN17KB
Customer	South Eastern Coalfields Ltd (SECL), Bilaspur				Date of Issue	22 July 2017
Project	Rajgamar UG			Sample Ref. No.	CMPDI/ENV/KSM/2017/09/945 Dated:01/06/2017	
Sampling Stations	10	Treated Water of Rajgamar Filter Plant			Date of Sampling	01 June 2017
	11	Drinking Water from Main Shaft /Main Incline			Date of Sampling	01 June 2017

Sl. No.	Parameter	Method of Analysis	Date of Analysis		01 June 2017	to	04 July 2017
			Observed Values		IS 10500: 2012		Uncertainty of Measurement (at 95% Confidence Level & K= 1.96)
			10	11	Acceptable Limit	Permissible Limit in the Absence of Alternate Source	
1	Colour, Hazen LDL: 1.0 Hazen	APHA, 22nd Edition, 2120 C. Spectrometric single wavelength Method	BDL	BDL	5	15	±0.22 Hazen at 4.778 Hazen
2	Odour	IS 3025 (Part 5):1983, (RA 2012) Physical (Qualitative)	Agreeable	Agreeable	Agreeable	Agreeable	None
3	Turbidity, NTU LDL: 1.0 NTU	IS 3025 (Part 10):1984, RA 2006, Nephelometric Method	4.75	2.5	1	5	±0.085 NTU at 0.944 NTU
4	pH LDL: 3.00	IS 3025 (Part 11):1983, (RA 2006), Electrometric Method	6.63	6.76	6.5-8.5	No relaxation	±0.127 at 7.0074
5	Alkalinity, mg/l as $CaCO_3$ LDL: 5.0 mg/l	IS 3025(Part 23):1986,(RA 2003) Titration Method	43	59	200	600	±0.19696 mg/l at 10 mg/l
6	Total Hardness, mg/l as $CaCO_3$ LDL: 4.0 mg/l	IS 3025 (Part 21):2009, EDTA Method	116	112	200	600	±11.54 mg/l at 612.8 mg/l
7	Iron, mg/l LDL: 0.06 mg/l	IS 3025 (Part 53) :2003: (RA 2009) AAS-Flame Method	0.06	0.06	0.3	No relaxation	±0.0036 mg/l at 0.061 mg/l
8	Chlorides, mg/l LDL: 0.5 mg/l	IS 3025(Part 32):1988 , (RA 2007), Argentometric Method	35	20	250	1000	±6.55 mg/l at 253.46 mg/l
9	Residual Free Chlorine, mg/l LDL: 0.02 mg/l	APHA, 22nd Edition, 4500G, DPD Colorimetric Method	0.05	0.04	0.2	1	±0.0082 mg/l at 0.177 mg/l
10	Total Dissolved Solids, mg/l LDL: 30.0 mg/l	IS 3025 (Part 16):1984 (RA 2006), Gravimetric Method	231	222	500	2000	±4.47 mg/l at 592.0 mg/l
11	Calcium, mg/l LDL: 2.0 mg/l	IS 3025 (Part 40): 1991, (RA 2009), EDTA Method	52	52	75	200	±2.51 mg/l at 99.74 mg/l
12	Copper, mg/l LDL: 0.03 mg/l	IS 3025 (Part 42) : 1992 (RA 2009), AAS-Flame Method	BDL	BDL	0.05	1.5	±0.13 mg/l at 4.895 mg/l
13	Manganese, mg/l LDL: 0.02 mg/l	IS 3025 (Part 59) : 2006, AAS-Flame Method	0.03	0.02	0.1	0.3	±0.0259 mg/l at 2.4423 mg/l
14	Sulphate, mg/l LDL: 2.0 mg/l	APHA, 22nd Edition, 4500- SO_4^{2-} E Turbidimetric Method	14.84	12.55	200	400	±0.64 mg/l at 19.88 mg/l
15	Nitrate, mg/l LDL: 0.5 mg/l	APHA, 22nd Edition, 4500, B UV-Spectrophotometric Method	0.65	0.85	45	No relaxation	±0.528 mg/l at 20.406 mg/l
16	Fluoride, mg/l LDL: 0.02 mg/l	APHA, 22nd Edition, 4500, F D SPADNS Method	0.12	0.31	1	1.5	±0.014 mg/l at 0.976 mg/l
17	Selenium, mg/l LDL: 0.002 mg/l	IS 3025 (Part 56):2003 AAS- VGA Method	BDL	BDL	0.01	No relaxation	±0.81 µg/l at 18.4 µg/l
18	Arsenic, mg/l LDL: 0.002 mg/l	IS 3025 (Part 37):1988(RA 2003) AAS- VGA Method	BDL	BDL	0.01	0.05	±0.81 µg/l at 18.4 µg/l
19	Lead, mg/l LDL: 0.005 mg/l	APHA, 22nd Edition, 3113B, AAS-GTA Method	BDL	BDL	0.01	No relaxation	±0.266 µg/l at 5.098 µg/l
20	Zinc, mg/l LDL: 0.01 mg/l	IS 3025 (Part 49) : 1994, (RA: 2009) AAS-Flame Method	0.02	0.05	5	15	±0.001 mg/l at 0.011 mg/l
21	Hexavalent Chromium, mg/l LDL: 0.01 mg/l	APHA, 22nd Edition, 3500 Cr^{6+} B Colorimetric Method	BDL	BDL	0.05	No relaxation	±0.001 mg/l at 0.0978 mg/l
22	Fecal Coliform, MPN/100 ml	APHA, 22nd Edition, 9221 Multiple Tube Fermentation Tech.	Nil	Nil	Nil	No relaxation	---
23	Boron, mg/l LDL: 0.2 mg/l	APHA, 22nd Edition, 4500-B, Carmine Method	BDL	BDL	0.5	1	±0.06 mg/l at 1.1096 mg/l
24	Phenolic compounds, mg/l LDL: 0.002 mg/l	APHA, 22nd Edition, 5530 C, Chloroform Extraction Method	BDL	BDL	0.001	0.002	±0.0204 mg/l at 0.1004 mg/l

LDL indicates Lower Detection Limit & BDL indicates Below Detection Limit

Gopalakrishna
Junior Scientific Asst.

K.K. Dhirhi
Lab-in-charge

M. Reagan Singh
Lab Coordinator

Note: 1)The results above relate to the samples tested as received.
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ENVIRONMENTAL MONITORING REPORT

AIR, NOISE & EFFLUENT

(KORBA AREA)

Environmental Monitoring

Incharge (C)

AUGUST - 2017

SAM 4/11

SOUTH EASTERN COALFIELDS LIMITED

(A Mini Ratna Company)

Central Mine Planning & Design Institute Limited
Regional Institute – V, SECL Complex,
BILASPUR (C.G.)

22/11/17

02/01/18

SOE(C) RC Mail Area N.O.

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ENVIRONMENTAL MONITORING REPORT
KORBA AREA - 'AUGUST' 2017

	CONTENTS	
Sl. No.	Name of Air Sampling Station	No. of samples
	Manikpur OC	
1	Substation - Manikpur OC	2
2	DETP - Manikpur OC	2
3	CGM - Office, Korba Area	2
4	Bhilai Basti	2
5	Kudri Village	2
6	Naktikhar Village	2
7	Dadar Village	2
8	Mudapara	2
	Rajgamar UG	
9	SAM Office	2
10	Colony	2
11	6&7 Incline	2
12	4&5 Incline	2
	Bagdewa UG	
13	Mine Manager office	2
	Dhelwadih UG	
14	SAM Office	2
15	Colony	2
	Singhali UG	
16	SOM Office / Manager Office	2
	Balgi UG	
17	Colony	2
18	SAM Office	2
	Banki UG	
19	SAM Office	2
20	5&6 Incline	2
21	Colony	2

07/01/18

	Surakkachhar UG	
22	SAM Office	2
23	Basti	2
24	3&4 Incline	2
	Total	40

02/01/18

S.no.	Name of Noise Sampling Station	No. of samples
	Manikpur OC	
1	Centre Point	2
2	Colony	2
3	Dozer Erection Yard	2
4	Bhilai Basti	2
5	Rapakhera Village	2
	Rajgamar UG	
6	SAM Office	2
7	Colony	2
8	6&7 Incline	2
9	4&5 Incline	2
	Bagdewa UG	
10	Mine Manager office	2
	Dhelwadih UG	
11	SAM Office	2
12	Colony	2
	Singhali UG	
13	SOM Office / Manager Office	2
	Balgi UG	
14	Colony	2
15	SAM Office	2
	Banki UG	
16	SAM Office	2
17	5&6 Incline	2
18	Colony	2
	Surakkachhar UG	
19	SAM Office	2
20	Surakkachhar Basti	2
21	3&4 Incline	2
	Total	42

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Sl. no.	Name of Effluent Sampling Station	No. of samples
	Manikpur OC	
1	U/S of Hasdeo river before joining mine discharge	2
2	D/S of Hasdeo river after joining mine discharge	2
3	Mine water from Eastern Quarry No.1	2
4	Workshop effluent	2
5	Discharge of (DETP) domestic effluent treatment plant	2
	Rajgamer UG	
6	Mine discharge water from 4&5 Incline after settling tank	2
7	Input water of Rajgamar filter plant	2
8	Strata water of 6&7 Incline	2
	Bagdewa UG	
9	Mine Effluent	2
10	Kohlar nalla water	2
	Dhelwadih UG	
11	Mine effluent after settling tank	2
	Singhali UG	
12	Mine effluent after of settling tank	2
	Balgi UG	
13	U/S of Ahiran river W.R.T mine water 1& 2 incline	2
14	Mine effluent of 1 & 2 incline After settling tank	2
	Banki UG	
15	Mine discharge water from main mine	2
16	Mine discharge water from 5&6 Incline	2
17	Mine discharge water from 9&10 Incline	2
	Surakkachhar UG	
18	Mine discharge water (Output after settling tank)	2
	Total	36

27/01/18

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AIR QUALITY REPORT

Month	AUGUST	Area	KORBA	Report No	KUS/2017/08/1

Name of the Customer	South Eastern Coalfields Ltd, Bilaspur	Date of Issue	26.10.2017
Name of the Project	Rajgamar UG	Sample Reference No.	5-8

Parameter			SPM	PM10	PM2.5	SO2	NO2	Remarks
Limit (in µg/m³)-24 hrs	Industrial Zone -(G.S.R. 742(E), dated 25.9.2000)	A-O	600	300	-	120	120	
		A-N	500	250	-	120	120	
	Residential Zone-(G.S.R. 826(E), dated 16.11.2009 and GSR 176 (E), AUGUST 02, 1998)	B	200	100	60	80	80	
Method of analysis			IS-5182 PART 4:2005	IS-5182 PART 23:2006	CPCB Vol-I, 2013	IS-5182 PART 2:2001	IS-5182 PART 6:2006	
Uncertainty Range (in µg/m³)				±19.04		±0.0687	±0.4420	

Station Name (Code)	Station category	Date of sampling	Date of analysis					
9.SAM Office	A-O	02.08.2017	03.08.2017	241	108	27	22	23	
		17.08.2017	18.08.2017	228	104	25	17	21	
10.Colony	B	02.08.2017	03.08.2017	167	71	19	16	15	
		17.08.2017	18.08.2017	163	59	17	18	16	
11. 6&7 Incline	A-O	02.08.2017	03.08.2017	196	83	21	21	20	
		17.08.2017	18.08.2017	188	76	19	20	23	
12. 4&5 Incline	A-O	02.08.2017	03.08.2017	199	77	23	17	18	
		17.08.2017	18.08.2017	193	88	25	19	21	

Analyzed by | Checked by | Lab In charge

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20/01/18

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cmpdi
A Miniratna Co.

Report No.

EFFLUENT WATER TEST REPORT
For the month of August'2017

KORBA AREA

Name of the Customer	South Eastern Coalfields Ltd. Bilaspur	Date of issue	
Name of the Project	DHELWADIH U/G SINGHALI U G, BALGI U G SURAKACHHAR U G, RAJGAMAR U G	Date of Sampling 1st.	2nd.
Name of the Stations	A DHELWADIH U/G		
	11 Mine effluent after settling tank	03.08.17	23.08.17
	B SINGHALI U/G		
	12 Mine effluent after of settling tank	03.08.17	23.08.17
	C BALGI U/G		
	13 Up- stream of Ahiran river w.r.t. mine water of 1/2 Incline	04.08.17	23.08.17
	14 Mine effluent of 1/2 Incline after settling tank.	04.08.17	23.08.17
	D SURAKACHHAR U/G		
	18 Mine discharge water (Out put of settling tank)	04.08.17	23.08.17
	E RAJGAMAR U.G		
	6 Mine discharge water from 4&5 Incline after settling tank	07.08.17	18.08.17
	7 Input water of Rajgamar filter plant.	07.08.17	18.08.17
	8 Strata water of 6/7 Incline.	07.08.17	18.08.17

Parameter	Method of Analysis	Observed Value 11	12	13	14	18	D	7	8	Limit (max)	General Standards for Discharge of Effluents	Method
pH Value, LDL	IS 3025 (Part 11) 1984, R 1996, Electrometric Method	7.06	7.24	7.88	7.92	6.53	6.56	7.15	7.04	5.5 - 9.0		
		6.81	7.20	7.80	6.89	6.46	6.52	7.42	7.26			
Total suspended Solids, mg/l, max	IS 3025 (Part 17) 1984, R 1996, Gravimetric Method	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	100		
		<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0			
C.O.D, mg/l, max	APHA, 22nd Edition, 5220B, open Reflux, Titration Method	12	16	12	16	12	16	08	04	250		
		08	12	12	12	08	12	<04	<04			
Oil & Grease, mg/l, max	IS 3025 (Part 39) 1991, R : 2003, Partition Gravimatric Method	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	10		
	Thermometric	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0			

Scientific Asst

Checked By

Chief Manager

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3) LDL indicates Lower Detection Limit & BDL indicates Below Detection Limit.

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NOISE QUALITY REPORT

Month	AUGUST	Area	KORBA	Report No	KSM/2017/08/1

Name of the Customer	South Eastern Coalfields Ltd, Bilaspur	Date of Issue	05.09.2017
Name of the Project	Rajgamar UG	Sample Reference No.	N6 - N9

Parameter			The Noise Pollution (R & C) rules, 2000		Remarks
			Day Time	Night Time	
Limit (in dB(A) Leq	Industrial area	A	75	70	
	Commercial area	B	65	55	
	Residential Area	C	55	45	
	Silence Zone	D	50	40	
Method of analysis	CPCB Protocol For Ambient Level Noise Monitoring				

Station (Code) Station Name	Station category	Date of measurement	Value in dB(A)	Value in dB(A)	
6-SAM Office	A	01.08.2017	44.1	41.5	
		16.08.2017	44.8	40.5	
7-Colony	C	01.08.2017	41.2	40.3	
		16.08.2017	42.1	37.4	
8-6&7 Incline	A	01.08.2017	47.6	44.8	
		16.08.2017	46.5	42.6	
9-4&5 Incline	A	01.08.2017	48.1	44.1	
		16.08.2017	47.4	43.6	

Analyzed by

Checked by

Lab In Charge

Note: 1) The results above relate to the sample tested

... CMPDI Bilaspur (C.G.)

20/01/18

50E(c)
17/10/17

(33)

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ENVIRONMENTAL MONITORING REPORT

AIR, NOISE & EFFLUENT

(KORBA AREA)

Environmental Monitoring

JULY - 2017

50E(c)
17/10/17

SOUTH EASTERN COALFIELDS LIMITED

(A Mini Ratna Company)

Central Mine Planning & Design Institute Limited
Regional Institute – V, SECL Complex,
BILASPUR (C.G.)

07/01/18

(Mail AE/Kork 12 pt font)

ENVIRONMENTAL MONITORING REPORT
KORBA AREA - 'JULY' 2017

(32)

	CONTENTS	
Sl. No.	**Name of Air Sampling Station**	No. of samples
	Manikpur OC	
1	Substation – Manikpur OC	2
2	DETP – Manikpur OC	2
3	CGM – Office, Korba Area	2
4	Bhilai Basti	2
5	Kudri Village	2
6	Naktikhar Village	2
7	Dadar Village	2
8	Mudapara	2
	Rajgamar UG	
9	SAM Office	2
10	Colony	2
11	6&7 Incline	2
12	4&5 Incline	2
	Bagdewa UG	
13	Mine Manager office	2
	Dhelwadih UG	
14	SAM Office	2
15	Colony	2
	Singhali UG	
16	SOM Office / Manager Office	2
	Balgi UG	
17	Colony	2
18	SAM Office	2
	Banki UG	
19	SAM Office	2
20	5&6 Incline	2
21	Colony	2

01/18

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AIR QUALITY REPORT

Month	JULY	Area	KORBA	Report No	KUS/2017/07/1

Name of the Customer	South Eastern Coalfields Ltd, Bilaspur	Date of Issue	05.08.2017
Name of the Project	Rajgamar UG	Sample Reference No.	5-8

Parameter			SPM	PM10	PM2.5	SO2	NO2	Remarks
Limit (in µg/m³)-24 hrs	Industrial Zone -(G.S.R. 742(E), dated 25.9.2000)	A-O	600	300	-	120	120	
		A-N	500	250	-	120	120	
	Residential Zone-(G.S.R. 826(E), dated 16.11.2009 and GSR 176 (E), April 02, 1996)	B	200	100	60	80	80	
Method of analysis			IS-5182 PART 4:2005	IS-5182 PART 23:2006	CPCB Vol-I, 2013	IS-5182 PART 2:2001	IS-5182 PART 6:2006	
Uncertainty Range (in µg/m³)				±19.04		±0.0687	±0.4420	

Station Name (Code)	Station category	Date of sampling	Date of analysis						
9.SAM Office	*A-O*	03.07.2017	04.07.2017	195	93	38	24	21	
		17.07.2017	18.07.2017	190	92	34	27	18	
10.Colony	*B*	03.07.2017	04.07.2017	180	61	22	19	13	
		17.07.2017	18.07.2017	160	57	22	19	14	
11. 6&7 Incline	*A-O*	03.07.2017	04.07.2017	225	91	34	18	20	
		17.07.2017	18.07.2017	212	109	23	23	22	
12. 4&5 Incline	*A-O*	03.07.2017	04.07.2017	216	104	17	24	21	
		17.07.2017	18.07.2017	209	93	37	23	21	

D. Das
Analyzed by

B Sarkar
Checked by

C. Kujur
Lab In charge

02/08/17

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NOISE QUALITY REPORT

Month	JULY	Area	KORBA	Report No	KSM/2017/07/1

Name of the Customer	South Eastern Coalfields Ltd, Bilaspur	**Date of Issue**	05.08.2017
Name of the Project	**Rajgamar UG**	**Sample Reference No.**	N6 – N9

Parameter			The Noise Pollution (R & C) rules, 2000		Remarks
			Day Time	Night Time	
Limit (in dB(A) Leq	Industrial area	A	75	70	
	Commercial area	B	65	55	
	Residential Area	C	55	45	
	Silence Zone	D	50	40	
Method of analysis	CPCB Protocol For Ambient Level Noise Monitoring				

Station (Code) Station Name	Station category	Date of measurement	Value in dB(A)	Value in dB(A)	
6-SAM Office	***A***	**01.07.2017**	**51.2**	**39.3**	
		18.07.2017	**54.3**	**49.4**	
7-Colony	***C***	**01.07.2017**	**48.9**	**43.9**	
		18.07.2017	**49.2**	**44.1**	
8-6&7 Incline	***A***	**01.07.2017**	**59.7**	**42.1**	
		18.07.2017	**59.7**	**47.3**	
9-4&5 Incline	***A***	**01.07.2017**	**54.9**	**52.7**	
		18.07.2017	**59.7**	**49.2**	

D. Das
Analyzed by

B Singh
Checked by

C. K. Vl
Lab In charge

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EFFLUENT WATER TEST REPORT
For the month of JULY'2017

Report No = 07

KORBA AREA

Name of the Customer		South Eastern Coalfields Ltd, Bilaspur	Date of Issue		13th August'2017	
Name of the Project			Date of Sampling		Date of Analysis	
			1st.	2nd.	1st.	2nd.
Name of the Stations	B	RAJGAMAR U.G.				
	6	Mine discharge water from 4&5 Incline after settling tank	03.07.17	17.07.17	19.07 to 24.07	01.08 to 07.08
	7	Input water of Rajgamar filter plant.	03.07.17	17.07.17	19.07 to 24.07	01.08 to 07.08
	8	Strata water of 6/7 Incline.	03.07.17	17.07.17	19.07 to 24.07	01.08 to 07.08
	C	BAGDEWA U/G				
	9	Mine effluent after settling tank	06.07.17	17.07.17	19.07 to 25.07	01.08 to 08.08
	10	Kolhar Nallah water.	06.07.17	17.07.17	19.07 to 25.07	01.08 to 08.08
	D	DHELWADIH U/G				
	11	Mine effluent after settling tank	06.07.17	21.07.17	19.07 to 23.07	01.08 to 07.08
	E	SINGHALI U/G				
	12	Mine effluent after of settling tank	06.07.17	21.07.17	19.07 to 23.07	01.08 to 07.08

Sl. No	Parameter	Method of Analysis	Observed Value							Lower Detection Limit	General Standards for Discharge of Environmental Pollution (Part A: Effluent) as per Schedule VI, Environment (Protection) Rules	Uncertainty of Measurement (at 95% C.L & K= 1.96)
			6	7	8	9	10	11	12			
1	pH Value, LDL	IS 3025 (Part 11):1983, R : 1996, Electrometric Method	6.81	7.49	7.63	6.94	7.41	6.79	7.26	0.01	5.5 to 9.0	±0.8841821 at 4.025
			6.78	7.41	7.59	6.91	7.40	6.80	7.29			
2	Total suspended Solids, mg/l, max	IS 3025 (Part 17):1984, R: 1996, Gravimetric Method	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	25.0	100.0	±0.445mg/l at 24.429 mg/l
			<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0			
3	C.O.D, mg/l, max	APHA, 22nd Edition, 5220B, open Reflux, Titration Method	16	<4.0	<4.0	16	20	12	16	4.0	250.0	0.61535782 at 16.2892 mg/l
			20	<4.0	<4.0	20	20	16	16			
4	Oil & Grease, mg/l, max	IS 3025 (Part 39):1991, R : 2003, Partition Gravimatric Method Thermometric	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	10.0	±0.207mg/l at 10.314mg/l
			<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0			
5	B.O.D(3 days 27°C), mg/l, max	IS 3025 (Part 44):1993, R : 2003, 3days Incubator at 27°C	-	-	-	-	-	-	-	2.0	30.0	11.7596682 at 202.4 mg/l
			-	-	-	-	-	-	-			

Scientific Asst

Checked By

Officer In-Charge

Note: 1)The results above relate to the samples tested as received.
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3) LDL indicates Lower Detection Limit & BDL indicates Below Detection Limit

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ENVIRONMENTAL MONITORING REPORT

AIR, NOISE & EFFLUENT

(KORBA AREA)

Environmental Monitoring

JUNE - 2017

SOUTH EASTERN COALFIELDS LIMITED

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Central Mine Planning & Design Institute Limited
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AIR QUALITY REPORT

Month	[illegible]	Area	KORBA	Report No	KUS/2017/06/1

Name of the Customer	South Eastern Coalfields Ltd, Bilaspur	Date of Issue	03.07.2017
Name of the Project	Rajgamar UG	Sample Reference No.	5-8

Parameter			SPM	PM10	PM2.5	SO2	NO2	Remarks
Limit (in µg/m³)-24 hrs	Industrial Zone -(G.S.R. 742(E), dated 25.9.2000)	A-O	600	300	-	120	120	
		A-N	500	250	-	120	120	
	Residential Zone-(G.S.R. 826(E), dated 16.11.2009 and GSR 176 (E), April 02, 1996)	B	200	100	60	80	80	
Method of analysis			IS-5182 PART 4:2005	IS-5182 PART 23:2006	CPCB Vol-I, 2013	IS-5182 PART 2:2001	IS-5182 PART 6:2006	
Uncertainty Range (in µg/m³)				±19.04		±0.0687	±0.4420	

Station Name (Code)	Station category	Date of sampling	Date of analysis					
5.SAM Office	*A-O*	01.06.2017	02.06.2017	190	94	35	27	20	
		27.06.2017	28.06.2017	193	91	38	23	23	
6.Colony	*B*	01.06.2017	02.06.2017	170	71	20	18	16	
		27.06.2017	28.06.2017	181	73	22	18	12	
7. 6&7 Incline	*A-O*	01.06.2017	02.06.2017	210	111	22	26	24	
		27.06.2017	28.06.2017	225	89	36	19	22	
8. 4&5 Incline	*A-O*	01.06.2017	02.06.2017	206	96	36	24	25	
		27.06.2017	28.06.2017	219	109	18	21	19	

D.Das
Analyzed by

B.S.Jha
Checked by

C.T.V.
Lab In charge

7/07/17

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NOISE QUALITY REPORT

Month	[illegible]	Area	KORBA	Report No	KSM/2017/06/1

Name of the Customer	South Eastern Coalfields Ltd, Bilaspur	**Date of Issue**	03.07.2017
Name of the Project	Rajgamar UG	**Sample Reference No.**	N6 – N9

Parameter			The Noise Pollution (R & C) rules, 2000		Remarks
			Day Time	Night Time	
Limit (in dB(A) Leq	Industrial area	A	75	70	
	Commercial area	B	65	55	
	Residential Area	C	55	45	
	Silence Zone	D	50	40	
Method of analysis	CPCB Protocol For Ambient Level Noise Monitoring				

Station (Code) Station Name	Station category	Date of measurement	Value in dB(A)	Value in dB(A)	
6-SAM Office	***A***	02.06.2017	49.9	40.7	
		16.06.2017	54.4	49.7	
7-Colony	***C***	02.06.2017	48.3	41.8	
		16.06.2017	48.8	43.2	
8-6&7 Incline	***A***	02.06.2017	59.8	42.4	
		16.06.2017	58.4	48.7	
9-4&5 Incline	***A***	02.06.2017	54.3	50.6	
		17.06.2017	59.8	49.5	

D. Dey
Analyzed by

B. Sadhu
Checked by

C. Jena
Lab in charge

03/01/18

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Report No = 06

EFFLUENT WATER TEST REPORT
For the month of June'2017

KORBA AREA

Name of the Customer	South Eastern Coalfields Ltd, Bilaspur	Date of Issue		13th July 2017	
Name of the Project		Date of Sampling		Date of Analysis	
		1st.	2nd.	1st.	2nd.
Name of the Stations	RAJGAMAR U/G				
6	Mine discharge water from 4&5 Incline after settling tank	02.06.17	27.06.17	14.06 to 21.06	28.06 to 04.0
7	Input water of Rajgamar filter plant.	02.06.17	27.06.17	14.06 to 21.06	28.06 to 04.0
8	Strata water of 6/7 Incline.	02.06.17	27.06.17	14.06 to 21.06	28.06 to 04.0
	BAGDEWA U/G				
9	Mine effluent after settling tank	01.06.17	17.06.17	14.06 to 20.06	28.06 to 05.0
10	Kolhar Nallah water.	01.06.17	17.06.17	14.06 to 20.06	28.06 to 05.0
	DHELWADIH U/G				
11	Mine effluent after settling tank	01.06.17	17.06.17	14.06 to 20.06	28.06 to 03.0
	SINGHALI U/G				
12	Mine effluent after of settling tank	01.06.17	17.06.17	14.06 to 20.06	28.06 to 03.0

Sl. No	Parameter	Method of Analysis	Observed Value							Lower Detection Limit	General Standards for Discharge of Environmental Pollutants (Part A Effluent) as per Schedule VI, Environment (Protection) Rules	Uncertainty of Measurement (at 95% C.L & K= 1.96)
			6	7	8	9	10	11	12			
1	pH Value, LDL	IS 3025 (Part 11):1983, R: 1996, Electrometric Method	6.87	7.44	7.19	6.87	7.68	6.71	7.22	0.01	5.5 to 9.0	±0.8841821 at 4.025
			6.82	7.40	7.25	6.79	7.61	6.87	7.25			
2	Total suspended Solids, mg/l, max	IS 3025 (Part 17):1984, R: 1996, Gravimetric Method	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	25.0	100.0	±0.445mg/l at 24.429 mg/l
			<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0			
3	C.O.D, mg/l, max	APHA, 22nd Edition, 5220B, open Reflux, Titration Method	16	<4.0	<4.0	16	16	08	16	4.0	250.0	0.61535782 at 16.2892 mg/l
			16	<4.0	<4.0	16	20	08	16			
4	Oil & Grease, mg/l, max	IS 3025 (Part 39):1991, R: 2003, Partition Gravimetric Method Thermometer	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	10.0	±0.207mg/l at 10.314mg/l
			<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0			
5	B.O.D(3 days 27°C), mg/l, max	IS 3025 (Part 44):1993, R: 2003, 3days Incubator at 27°C								2.0	30.0	11.7596682 at 202.4 mg/l

B. Sadhay
Scientific Asst

Checked By

Officer In Charge

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3) LDL indicates Lower Detection Limit & BDL indicates Below Detection Limit

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ENVIRONMENTAL MONITORING REPORT

AIR, NOISE & EFFLUENT

(KORBA AREA)

Environmental Monitoring

MAY - 2017

SOUTH EASTERN COALFIELDS LIMITED

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AIR QUALITY REPORT

Month	May	Area	KORBA	Report No	KUS/2017/05/1

Name of the Customer	South Eastern Coalfields Ltd, Bilaspur	Date of Issue	06.06.2017
Name of the Project	Rajgamar UG	Sample Reference No.	5-8

Parameter			SPM	PM10	PM2.5	SO2	NO2	Remarks
Limit (in µg/m³)-24 hrs	Industrial Zone -(G.S.R. 742(E), dated 25.9.2000)	A-O	600	300	-	120	120	
		A-N	500	250	-	120	120	
	Residential Zone-(G.S.R. 826(E), dated 16.11.2009 and GSR 176 (E), April 02, 1996)	B	200	100	60	80	80	
Method of analysis			IS-5182 PART 4:2005	IS-5182 PART 23:2006	CPCB Vol-I, 2013	IS-5182 PART 2:2001	IS 5182 PART 6:2006	
Uncertainty Range (in µg/m³)				±19.04		±0.0687	±0.4420	

Station Name (Code)	Station category	Date of sampling	Date of analysis						
5.SAM Office	*A-O*	02.05.2017	03.05.2017	194	99	34	25	19	
		16.05.2017	17.05.2017	197	95	35	24	23	
6.Colony	*B*	02.05.2017	03.05.2017	169	72	18	16	23	
		16.05.2017	17.05.2017	177	77	24	17	13	
7. 6&7 Incline	*A-O*	02.05.2017	03.05.2017	211	114	25	21	22	
		16.05.2017	17.05.2017	223	87	32	19	20	
8. 4&5 Incline	*A-O*	02.05.2017	03.05.2017	202	98	30	22	23	
		16.05.2017	17.05.2017	224	108	22	24	19	

B. Sonu
Analyzed by

Checked by

C. Jc Vd
Lab In charge

07/01/18

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NOISE QUALITY REPORT

Month	MAY	Area	KORBA	Report No	KSM/2017/05/1

Name of the Customer	South Eastern Coalfields Ltd, Bilaspur	Date of Issue	05.06.2017
Name of the Project	Rajgamar UG	Sample Reference No.	N6 – N9

Parameter			The Noise Pollution (R & C) rules, 2000		Remarks
			Day Time	Night Time	
Limit (in dB(A) Leq	Industrial area	A	75	70	
	Commercial area	B	65	55	
	Residential Area	C	55	45	
	Silence Zone	D	50	40	
Method of analysis	CPCB Protocol For Ambient Level Noise Monitoring				

Station (Code) Station Name	Station category	Date of measurement	Value in dB(A)	Value in dB(A)	
6-SAM Office	***A***	**02.05.2017**	**50.0**	**39.9**	
		16.05.2017	**53.6**	**49.8**	
7-Colony	***C***	**02.05.2017**	**48.7**	**41.5**	
		16.05.2017	**47.9**	**44.0**	
8-6&7 Incline	***A***	**02.05.2017**	**59.0**	**42.5**	
		16.05.2017	**58.5**	**47.9**	
9-4&5 Incline	***A***	**02.05.2017**	**54.7**	**50.3**	
		17.05.2017	**59.0**	**49.6**	

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Lab In charge

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EFFLUENT WATER TEST REPORT
For the month of May'2017

Report No = 05

KORBA AREA

Name of the Customer	South Eastern Coalfields Ltd, Bilaspur		Date of Issue		10th June'2017	
Name of the Project			Date of Sampling		Date of Analysis	
			1st.	2nd.	1st.	2nd.
Name of the Stations		*RAJGAMAR U/G*				
	6	Mine discharge water from 4&5 Incline after settling tank	03.05.17	16.05.17	16.05 to 25.05	29.05 to 10.0
	7	Input water of Rajgamar filter plant	03.05.17	16.05.17	16.05 to 25.05	29.05 to 10.0
	8	Strata water of 6/7 Incline	03.05.17	16.05.17	16.05 to 25.05	29.05 to 10.0
		BAGDEWA U/G				
	9	Mine effluent after settling tank	03.05.17	16.05.17	16.05 to 25.05	29.05 to 09.0
	10	Kolhar Nallah water	03.05.17	16.05.17	16.05 to 25.05	29.05 to 09.0
		DHELWADIH U/G				
	11	Mine effluent after settling tank	04.05.17	16.05.17	16.05 to 25.05	29.05 to 10.0
		SINGHALI U/G				
	12	Mine effluent after of settling tank	04.05.17	16.05.17	16.05 to 25.05	29.05 to 10.0

Sl. No	Parameter	Method of Analysis	Observed Value							Lower Detection Limit	General Standards for Discharge of Environmental Pollution (Part A: Effluent) as per Schedule VI, Environment (Protection) Rules	Uncertainty of Measurement (at 95% C.L & k= 1.96)
			6	7	8	9	10	11	12			
1	pH Value, LDL	IS 3025 (Part 11) 1983, R 1996, Electrometric Method	6.78	7.41	7.74	6.83	7.28	6.89	7.29	0.01	5.5 to 9.0	+0.984161 at 4.025
2	Total suspended Solids, mg/l, max	IS 3025 (Part 17):1984, R 1996, Gravimetric Method	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	25.0	100.0	±0.445mg/l at 24.429 mg/l
3	C.O.D, mg/l, max	APHA, 22nd Edition, 5220B, open Reflux Titration Method	16	<4.0	<4.0	20	20	08	12	4.0	250.0	0.61535782 at 16.2892 mg/l
4	Oil & Grease, mg/l, max	IS 3025 (Part 39) 1992, R 2003, Partition Gravimetric Method Thermometric	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	10.0	±0.207mg/l at 10.314mg/l
5	B.O.D(3 days 27°C), mg/l, max	IS 3025 (Part 44):1993, R 2003, 3days Incubator at 27°C	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	30.0	±1.7596682 at 202.4 mg/l

Scientific Asst | Checked By | Officer In-Charge

Note: 1) The results above relate to the samples tested as received.
2) This report can not be reproduced in part or full without the written permission of the HOD (Env), CMPDI, RI-V.
3) LDL indicates Lower Detection Limit & BDL indicates Below Detection Limit

07/01/18

(20)

cmpdi

A Mini-Ratna Company

ENVIRONMENTAL MONITORING REPORT

AIR, NOISE & EFFLUENT

(KORBA AREA)

Environmental Monitoring

APRIL - 2017

SOUTH EASTERN COALFIELDS LIMITED

(A Mini Ratna Company)

Central Mine Planning & Design Institute Limited
Regional Institute – V, SECL Complex,
BILASPUR (C.G.)

20/01/18

(8)

CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute-V,
Phone: (07815) 271646, email: rdri5.cmpdi@coalindia.in,
website: www.cmpdi.co.in

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A Mini Ratna Company

AIR QUALITY REPORT

Month	APRIL	Area	KORBA	Report No	KUS/2017/04/1

Name of the Customer	South Eastern Coalfields Ltd, Bilaspur	Date of Issue	13.05.2017
Name of the Project	Rajgamar UG	Sample Reference No.	S-8

Parameter			SPM	PM10	PM2.5	SO2	NO2	Remarks
Limit (in µg/m³)-24 hrs	Industrial Zone -(G.S.R. 742(E), dated 25.9.2000)	A-O	600	300	-	120	120	
		A-N	500	250	-	120	120	
	Residential Zone-(G.S.R. 826(E), dated 16.11.2009 and GSR 176 (E), April 02, 1996)	B	200	100	60	80	80	
Method of analysis			IS 5182 PART 4:2005	IS 5182 PART 23:2006	CPCB Vol I, 2013	IS 5182 PART 2:2001	IS 5182 PART 6:2006	
Uncertainty Range (in µg/m³)				±19.04		±0.0687	±0.4420	

Station Name (Code)	Station category	Date of sampling	Date of analysis						
5.SAM Office	*A-O*	03.04.2017	04.04.2017	198	100	32	25	21	
		17.04.2017	18.04.2017	193	99	32	25	23	
6.Colony	*B*	03.04.2017	04.04.2017	171	71	28	16	23	
		17.04.2017	18.04.2017	174	68	22	21	18	
7. 6&7 Incline	*A-O*	04.04.2017	05.04.2017	223	92	37	23	26	
		18.04.2017	19.04.2017	212	115	27	25	25	
8. 4&5 Incline	*A-O*	04.04.2017	05.04.2017	227	107	36	26	21	
		18.04.2017	19.04.2017	200	103	35	26	21	

Analyzed by

Checked by

Lab In charge

08/01/18

(18)

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Environment Laboratory, Regional Institute-V
Phone: (07815) 271646, email: rdri5.cmpdi@coalindia.in,
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NOISE QUALITY REPORT

Month	APRIL	Area	KORBA	Report No	KSM/2017/04/1

Name of the Customer	South Eastern Coalfields Ltd, Bilaspur	Date of Issue	10.05.2017
Name of the Project	Rajgamar UG	Sample Reference No.	N6 – N9

Parameter			The Noise Pollution (R & C) rules, 2000		Remarks
			Day Time	Night Time	
Limit (in dB(A) Leq	Industrial area	A	75	70	
	Commercial area	B	65	55	
	Residential Area	C	55	45	
	Silence Zone	D	50	40	
Method of analysis	CPCB Protocol For Ambient Level Noise Monitoring				

Station (Code) Station Name	Station category	Date of measurement	Value in dB(A)	Value in dB(A)	
6-SAM Office	***A***	**01.04.2017**	**50.9**	**40.0**	
		24.04.2017	**53.7**	**49.7**	
7-Colony	***C***	**01.04.2017**	48.7	**43.5**	
		24.04.2017	49.1	**44.1**	
8-6&7 Incline	***A***	**01.04.2017**	59.1	**42.4**	
		24.04.2017	59.4	**48.0**	
9-4&5 Incline	***A***	**01.04.2017**	54.7	**52.3**	
		24.04.2017	59.1	**49.5**	

Analyzed by

Checked by

Lab In charge

02/01/18

(12)

CENTRAL MINE PLANNING AND DESIGN INSTITUTE LIMITED
Environment Laboratory, Regional Institute V,
SECL Complex, Seepat Road, Bilaspur (C.G.)- 495 006,
Phone: (07752) 246371, email: rilvgm.cmpdi@gmail.com, website: www.cmpdi.co.in

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A Mini Ratna Company

EFFLUENT WATER TEST REPORT
For the month of April'2017

Report No = 04

KORBA AREA

Name of the Customer	South Eastern Coalfields Ltd, Bilaspur	Date of Issue		12th May'2017	
Name of the Project		Date of Sampling		Date of Analysis	
Name of the Stations		1st.	2nd.	1st.	2nd.
	RAJGAMAR U/G				
6	Mine discharge water from 4&5 Incline after settling tank	01.04.17	17.04.17	11.04 to 20.04	27.04 to 08.0
7	Input water of Rajgamar filter plant	01.04.17	17.04.17	11.04 to 21.04	27.04 to 08.0
8	Strata water of 6/7 Incline	01.04.17	17.04.17	11.04 to 20.04	27.04 to 08.0
	BAGDEWA U/G				
9	Mine effluent after settling tank	07.04.17	22.04.17	11.04 to 18.04	27.04 to 09.0
10	Kolhar Nallah water.	07.04.17	22.04.17	11.04 to 18.04	27.04 to 05.0
	DHELWADIH U/G				
11	Mine effluent after settling tank	07.04.17	22.04.17	11.04 to 20.04	27.04 to 06.0
	SINGHALI U/G				
12	Mine effluent after of settling tank	07.04.17	22.04.17	11.04 to 20.04	27.04 to 06.0

Sl. No	Parameter	Method of Analysis	Observed Value							Lower Detection Limit	General Standards for Discharge of Environmental Pollution (Part A: Effluent) as per Schedule VI, Environment (Protection) Rules	Uncertainty of Measurement (at 95% C.L & K= 1.96)
			6	7	8	9	10	11	12			
1	pH Value, LDL	IS 3025 (Part 11):1983, R 1996, Electrometric Method	6.91	7.41	7.38	6.84	7.39	6.87	7.26	0.01	5.5 to 9.0	±0.8841821 at 4.025
			6.85	7.41	7.32	6.82	7.41	7.29	7.24			
2	Total suspended Solids, mg/l, max	IS 3025 (Part 17):1984, R 1996, Gravimetric Method	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	25.0	100.0	±0.445mg/l at 24.429 mg/l
			<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0			
3	C.O.D, mg/l, max	APHA, 22nd Edition, 5220B, open Reflux, Titration Method	16	<4.0	<4.0	16	20	08	12	4.0	250.0	0.61535782 at 16.2892 mg/l
			20	<4.0	<4.0	12	20	08	12			
4	Oil & Grease, mg/l, max	IS 9025 (Part 39):1991, R : 2003, Partition Gravimetric Method Thermometric	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	10.0	±0.207mg/l at 10.314mg/l
			<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0			
5	B.O.D(3 days 27°C), mg/l, max	IS 3025 (Part 44):1993, R 2003, 3days Incubator at 27°C								2.0	30.0	11.7596682 at 202.4 mg/l

B Sridhar
Scientific Asst

Checked By

Officer In-Charge

Note: 1)The results above relate to the samples tested as received
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3) LDL indicates Lower Detection Limit & BDL indicates Below Detection Limit

02/01/18

EXPENDITURE FROM 01/07/2017 TO 31/12/2017.

FOR WORKS RELATED TO ENVIRONMENT AT R[illegible].

Sl.	Description of works	Amount.
1.	Cleaning and upkeeping of 786 nos. m/q at [illegible] colony.	1,28,000=00
2.	Road repairing from Risdichowk to 4x5 incline at [illegible] mine.	1,59,843=00
3.	Cleaning of [illegible] drain at 6x7 & 4x5 incline.	62,658=00
4.	Annual cleaning and upkeeping [illegible] colony	1,23,000=00
5.	Laying of sawwater pipe line from settling tank main incline to settling tank filter plant [illegible].	2,16,030=54
6.	Annual cleaning and upkeeping B, C, DM, Revise and D type quarters at [illegible].	1,95,548=42
7.	Making brick wall and [illegible] of bore hole at 6x7 incline (32 pump, 17 pump, 50 pump, 38 bore well) at [illegible]	32,449=41

Total 9,17,529=37

[signature] 07/01/18

[signature] 15/12/2017

राज्य. इ.सी. एस / कोरबा क्षेत्र
रजगामार कालरी

(15)

No/. SECL/KC/ वि.भ्र/2017/249   Date 01/8/2017

प्रति,

सरपंच
ग्राम पंचायत : गोढ़मा / रजगामार

विषय :- रजगामार भूमिगत विस्तार परियोजना के विस्तार (0.30 MTPA से 0.450 MTPA) की पर्यावरण स्वीकृति की प्रतिलिपि।

महोदय,

क्षेत्रीय मुख्यालय / कोरबा से प्राप्त निम्नांकित पर्यावरण स्वीकृति की प्रतिलिपि आपकी जानकारी हेतु प्रेषित है।

संलग्न :- पर्यावरण स्वीकृति की प्रतिलिपि

भवदीय
Jagdish, Singh
उप क्षेत्रीय प्रबंधक
रजगामार उपक्षेत्र

प्रतिलिपि :- स्टाफ अधिकारी (पर्यावरण) कोरबा क्षेत्र।

ब्रजकुंवर
सरपंच,
ग्राम पंचायत – रजगामार,
जनपद पंचायत – कोरबा,
जिला – कोरबा (छ. ग.)

मानकुंवर
सरपंच,
ग्राम पंचायत – गोढ़मा,
जनपद पंचायत – कोरबा,
जिला – कोरबा (छ. ग.)

07/01/18

No.J-11015/165/2005-IA.II(M)
Government of India
Ministry of Environment & Forests

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

Dated 18th May 2009

To
Chief General Manger (Civil/Env./Forest),
M/s South Eastern Coalfields Ltd.,
Bilaspur,
Chhattisgarh.

Sub: Expansion of Rajgamar Underground Coal Mine Project (from 0.30 MTPA to 0.45 MTPA) of M/s South Eastern Coalfields Ltd. (SECL), located in village Rajgamar, Tehsil & District Korba, Chhattisgarh - environmental clearance – reg.

Sir

This has reference to Ministry of Coal's letter No. 43011/15/2002-CPAM dated 24.03.2003 and your letter No. SECL/BSP/ENVT./2005/EMP/248 dated 30.03.2005 submitting the application on the aforesaid project and to M/s Coal India Ltd.'s letter No. CIL/DLI/ENV/2005/32 dated 01.4.2005 and 27.04.2005 and your subsequent letter dated 03.04.2006 on the above-mentioned subject. The Ministry of Environment & Forests has considered your application. It has been noted that the project is for expansion in production of the existing Rajgamar Underground Coalmine Project (UGP). The total project area is 3486.577 ha of which 1485.151 ha is agricultural land and 1994.121 ha is forestland. Forestry clearance has been obtained for 461.60 ha of forestland on 14.03.2006. Of the total lease area, area for UG mining is 3486.577 ha, and on the surface, an area of 255.945 ha is for infrastructure, which includes 31.81 ha for roads, 55.847 ha for railways, and 62.457 ha for township, and 53.46 ha is for green belt. There area no National Parks, Wildlife Sanctuary, Biosphere Reserves found in the 10 km buffer zone. A number of streams pass through the lease. The project does not involve modification of the natural drainage. Project does not involve R&R. Mining will be underground by manual and semi-mechanised method. Expansion of the rated capacity of the mine is from 0.30 million tonnes per annum (MTPA) to 0.45 MTPA of coal production. Mineral transportation of 900 TPD of coal is by road. Ultimate working depth of the mine is 160m below ground level (bgl). Water table is in the range of 6.16 m – 11.36 m during pre-monsoon and 2.99 m to 9.25 m bgl during post-monsoon. Mining will intersect water table. Average water requirement is 1250 m3/d, which will be met from mine pit water. Public Hearing was held on 29.09.2004. NOC has been obtained on 02.03.2005. Balance life of the mine at the rated capacity is 16 years. The project has been approved by M/s SECL on 28.03.2005. The capital cost of the project is Rs. 32.25 crores.

2. The Ministry of Environment & forests hereby accords environmental clearance for the above-mentioned Rajgamar Underground Coal Mine Project of M/s SECL for production of coal at 0.45 MTPA rated capacity under the provisions of the Environmental Impact Assessment Notification, 1994 and subsequent amendments thereto subject to the compliance of the terms and conditions mentioned below:

A Specific Conditions

(i) Mining shall not be carried in forestland for which forestry clearance has not been obtained under the provisions of FC Act, 1980.

(ii) Sufficient coal pillars shall be left unextracted around the air shaft (within the subsidence influence area) to protect from any damage from subsidence, if any.

(iii) Solid barriers shall be left below the roads falling within the blocks to avoid any damage to the roads.

(iv) No depillaring operation shall be carried out below villages and other surface structures.

(13)

(v) Depression due to subsidence resulting in water accumulating within the low lying areas shall be filled up or drained out by cutting drains.

(vi) While extracting panels in the lower seam, all water bodies in the subsidence area shall be drained. De-watering of the old goaves of the upper seam shall be continued as long as the lower seam is worked to prevent accumulation of large water bodies over working area

(vii) Regular monitoring of subsidence movement on the surface over and around the working area and impact on natural drainage pattern, water bodies, vegetation, structure, roads and surrounding should be continued till movement ceases completely. In case of observation of any high rate of subsidence movement, appropriate effective corrective measures should be taken to avoid loss of life and material. Cracks should be effectively plugged with ballast and clayey soil/suitable material

(viii) Garland/surface drains (size, gradient and length) around the safety areas such as mine shaft and low lying areas and sump capacity should be designed keeping 50% safety margin over an above the peak sudden rainfall and maximum discharge in the area adjoining the mine sites. Sump capacity should also provided adequate retention period to allow proper setting of silt material. Sufficient number of pumps of adequate capacity shall be deployed to pump out mine water during peak rainfall.

(ix) Crushers at the CHP should be operated with high efficiency bag filters, water sprinkling system should be provided to check fugitive emissions from crushing operations, conveyor system, haulage roads, transfer points, etc.

(x) Drills should be wet operated.

(xi) Controlled blasting should be practiced with use of delay detonators.

(xii) A progressive afforestation plan shall be prepared and implanted for the undisturbed area and shall include area brought under green belt development, areas along roads, infrastructure, over surface where mining is being done below, along ML boundary an township outside the lease areas, etc, by planting native species in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per ha.

(xiii) Conservation Plan for endangered species found in and around the project area shall be formulated in consultation with the State Forest and Wildlife Departments.

(xiv) Regular monitoring of groundwater level and quality should be carried out by establishing a network of exiting wells and construction of new pelzometers. The monitoring for quantity should 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 should be submitted to the Ministry of Environment & Forests and tot eh Central Pollution Control Board quarterly within one month of monitoring.

(xv) The Company shall put up artificial groundwater recharge measures for augmentation of groundwater resource. The project authorities should meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.

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

(xvii) Sewage treatment plant should be installed in the existing colony. ETP should also be provided for workshop and CHP wastewater.

(xviii) Digital processing of the entire lease area using remote sensing technique should be done regularly once in 3 years for monitoring land use pattern and report submitted to MOEF and its Regional office at Bhopal

(12)

(xviii) A Final Mine Closure Plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.

(xix) Consent to Operate shall be obtained before expanding mining operations.

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) 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.

(v) 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.

(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.

07/01/18

(91)

(8)

(xiv) A copy of the clearance letter 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)
Additional Director

Copy to:

1. Secretary, Ministry of Coal, New Delhi.
2. Secretary, Department of Environment & Forests, Government of Chhattisgarh, Secretariat, Raipur.
3. Chief Conservator of Forests, Regional office (EZ), Ministry of Environment & Forests, E-2/240 Arear Colony, Bhopal – 462016.
4. Chairman, Chhattisgarh Environment Conservation Board, 14/3 Park Street, Choubey Colony, Raipur.
5. Chairman, Central Pollution Control Board, CBD-cum-Office Complex, East Arjun Nagar, New Delhi-110032.
6. Member-Secretary, Central Ground Water Authority, Ministry of Water Resources, Curzon Road Barracks, A-2, W-3 Kasturba Gandhi Marg, New Delhi.
7. Shri M.K. Shukla, CGM, Coal India Limited, SCOPE Minar, Core-I, 4t Floor, Vikas Marg, Laxminagar, New Delhi.
8. District Collector, Korba, Government of Chhattisgarh, New Delhi.
9. Monitoring File 10. Guard File 11. Record File

(15)
(10)

WELL WATER LEVEL READINGS FOR PRE-MONSOON, MONSOON AND POST-MONSOON PERIODS-2017 FOR THE WELLS IN SURROUNDING VILLAGES OF RAJGAMAR UNDERGROUND COAL MINE, KORBA AREA, S.E.C.L

PERIOD: PRE-MONSOON-MAY 2017

NO. OF WELL	NAME OF VILLAGE	LOCATION/OWNERSHIP	TOP LEVEL OF WATER(m)	DEPTH OF WELL (m)	DIA OF WELL (m)
1	Patrapali	Constructed by Gram Sammittee	7	7	4.9
2		Near Primary School	6	6.8	3.2
3	Thakurketa	Mahettar Singh Rathiya	8.4	9	4.1
4		Dhaniram Ji	8	9	3.5
5	Tevanara	Balakram Rathiya	6.4	7.5	4
6		Manram Rathiya	7	9.5	4
7	Gorma	Ghuram Singh	9	9.5	4.5
8		Dilip Singh	6.5	8	4
9	Kesala	Chammar Singh	8	9	5.5
10		Nohar Singh Rathiya	8.2	9	5.5
11	Kerakachhar	Primary School	6	8	3.3
12		Gambhir Singh Rathiya	5	7	4
13	Basinkhar	Shyamlal Aghaniya	6.5	7	3
14		Nohar Lal Singh	6.5	7	3.2
15	Gangdei	Shiv Charan Rathiya	7.6	9	3
16		Constructed by Local Body	5.5	8.5	4
17	Rajgamar	Constructed by Local Body	6.5	7.5	4
18		Jagdish Ji	4.8	7.8	4
19	Chhuidhoda	Sunaram Ji	8.7	9	3.7
20		Baladram Ji	7.4	7.4	4
21	Amadand	Nohar Sai	6.3	9	4
22		Ramlal Ji	6.5	9.5	3
23	Dhengurdih	Dasiram Ji	9.9	10.3	5
24		Prem Singh	9.3	9.3	4
25	Korkoma	Jagdish Vishkarma	7.6	8	4.5
26		Rupa Bai Ji	7	9	5
27	Newadih	Soniro Bai	6.5	7.5	4.5

27/12/2017

07/01/18

PERIOD: MONSOON-AUGUST 2017

NO. OF WELL	NAME OF VILLAGE	LOCATION/OWNERSHIP	TOP LEVEL OF WATER(m)	DEPTH OF WELL (m)	DIA OF WELL (m)
1	Patrapali	Constructed by Gram Sammittee	5.3	7	4.9
2		Near Primary School	5.2	6.8	3.2
3	Thakurketa	Mahettar Singh Rathiya	5.2	9	4.1
4		Dhaniram Ji	6.1	9	3.5
5	Tevanara	Balakram Rathiya	4.9	7.5	4
6		Manram Rathiya	6.5	9.5	4
7	Gorma	Ghuram Singh	6.8	9.5	4.5
8		Dilip Singh	4.25	8	4
9	Kesala	Chammar Singh	6	9	5.5
10		Nohar Singh Rathiya	7.2	9	5.5
11	Kerakachhar	Primary School	3.6	8	3.3
12		Gambhir Singh Rathiya	2.5	7	4
13	Basinkhar	Shyamlal Aghaniya	2.8	7	3
14		Nohar Lal Singh	3.6	7	3.2
15	Gangdei	Shiv Charan Rathiya	5.2	9	3
16		Constructed by Local Body	2.7	8.5	4
17	Rajgamar	Constructed by Local Body	2.7	7.5	4
18		Jagdish Ji	1.4	7.8	4
19	Chhuidhoda	Sunaram Ji	6.4	9	3.7
20		Baladram Ji	6.8	7.4	4
21	Amadand	Nohar Sai	2.8	9	4
22		Ramlal Ji	3.2	9.5	3
23	Dhengurdih	Dasiram Ji	5.6	10.3	5
24		Prem Singh	6.2	9.3	4
25	Korkoma	Jagdish Vishkarma	4.3	8	4.5
26		Rupa Bai Ji	4.5	9	5
27	Newadih	Soniro Bai	4.3	7.5	4.5

(13)
(8)

PERIOD: POST MONSOON-NOVEMBER 2017

NO. OF WELL	NAME OF VILLAGE	LOCATION/OWNERSHIP	TOP LEVEL OF WATER(m)	DEPTH OF WELL (m)	DIA OF WELL (m)
1	Patrapali	Constructed by Gram Sammittee	5.7	7.0	4.9
2		Near Primary School	5.2	6.8	3.2
3	Thakurketa	Mahettar Singh Rathiya	5.5	9	4.1
4		Dhaniram Ji	6.1	9	3.5
5	Tevanara	Balakram Rathiya	5.2	7.5	4
6		Manram Rathiya	6.8	9.5	4
7	Gorma	Ghuram Singh	7	9.5	4.5
8		Dilip Singh	4.6	8	4
9	Kesala	Chammar Singh	6.4	9	5.5
10		Nohar Singh Rathiya	7.5	9	5.5
11	Kerakachhar	Primary School	4	8	3.3
12		Gambhir Singh Rathiya	2.7	7	4
13	Basinkhar	Shyamlal Aghaniya	3.1	7	3
14		Nohar Lal Singh	3.9	7	3.2
15	Gangdei	Shiv Charan Rathiya	5.4	9	3
16		Constructed by Local Body	2.9	8.5	4
17	Rajgamar	Constructed by Local Body	3	7.5	4
18		Jagdish Ji	2.7	7.8	4
19	Chhuidhoda	Sunaram Ji	6.7	9	3.7
20		Baladram Ji	7.1	7.4	4
21	Amadand	Nohar Sai	3.2	9	4
22		Ramlal Ji	3.2	9.5	3
23	Dhengurdih	Dasiram Ji	5.9	10.3	5
24		Prem Singh	6.5	9.3	4
25	Korkoma	Jagdish Vishkarma	4.6	8	4.5
26		Rupa Bai Ji	4.7	9	5
27	Newadih	Soniro Bai	4.5	7.5	4.5

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09/01/18

Drinking Water Quality Test Report

(7)

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DRINKING WATER QUALITY REPORT

KORBA AREA

Report No

Name of the Customer	South Eastern Coalfields Ltd, Bilaspur		Date of Issue	19.12.2017	
Name of the Project	Rajgamar UG	Sample Reference No.	CMPDI/Q9/1220, Dated: 19.09.2017		
Name of the Station	1.Dugwell of Dilip Singh, Gorma	Date of Sampling	18.09.2017	Date of Analysis	
Name of the Station	2. Dugwell of Chamar Singh, Kesla	Date of Sampling	18.09.2017	18.09.2017 to 09.12.2017	

Sl. No	Parameter	Method of Analysis	Observed Value		IS 10500:2012		Uncertainty of Measurement (at 95% C.L & K= 1.96)
			1	2	Acceptable Limit	Permissible Limit in the Absence of Alternate Source	
1.	Colour, Hazen *LDL: 1.0 Hazen*	APHA, 22nd Edition, 2120. C. Spectrometric single wavelength	13	02	5	15	±1.05 Hazen at 49.86 Hazen
2.	Odour	IS 3025 (Part 5):1983, Physical (Qualitative)	Agreeable	Agreeable	Agreeable	Agreeable	---
3.	Turbidity, NTU *LDL: 1.0 NTU*	IS 3025 (Part 10):1984, R : 1996, Nephelometric Method	1.12	2.80	1	5	±0.85 NTU at 41.58 NTU
4.	pH *LDL: 3.00*	IS 3025 (Part 11):1983, R : 1996, Electrometric Method	6.58	6.61	6.5-8.5	No relaxation	±0.12 at 7.00
5.	Alkalinity as $CaCO_3$ mg/l *LDL: 5.0 mg/l*	IS 3025(Part 23):1986, Titration Method	85	105	200	600	±0.19 mg/l at 10 mg/l
6.	Total Hardness mg/l as $CaCO_3$ *: 4.0 mg/l*	IS 3025 (Part 21):2009, EDTA Method	82	186	200	600	±11.54 mg/l at 612.8 mg/l
7.	Iron, mg/l *LDL: 0.06 mg/l*	IS 3025 (Part 53) :2003, AAS-Flame Method	0.06	0.06	0.3	No relaxation	±0.07 mg/l at 7.95 mg/l
8.	Chlorides, mg/l LDL: 0.5 mg/l	IS 3025(Part 32):1988 , R : 2007, Argentometric Method	8.0	63.5	250	1000	±6.55 mg/l at 253.46 mg/l
9.	Residual Free Chlorine, mg/l *LDL: 0.02 mg/l*	APHA, 22nd Edition, 4500G, DPD Colorimetric Method	0.02	BDL	0.2	1	±0.008 mg/l at 0.177 mg/l
10.	Total Dissolved Solids, mg/l *LDL: 30.0 mg/l*	IS 3025 (Part 16):1984 R : 2006, Gravimetric Method	254	664	500	2000	±4.47 mg/l at 592.0 mg/l
11.	Calcium, mg/l *LDL: 2.0 mg/l*	IS 3025 (Part 40): 1991, R : 2009, EDTA Method	21.6	31.2	75	200	±2.51 mg/l at 99.74 mg/l
12.	Copper, mg/l *LDL: 0.03 mg/l*	IS 3025 (Part 42) : 1992 R : 2009, AAS-Flame Method	BDL	BDL	0.05	1.5	±0.13 mg/l at 4.89 mg/l
13.	Manganese, mg/l *LDL: 0.02 mg/l*	IS 3025 (Part 59) : 2006, AAS-Flame Method	0.02	0.02	0.1	0.3	±0.02 mg/l at 2.44 mg/l
14.	Sulphate, mg/l *LDL: 2.0 mg/l*	APHA, 22nd Edition, 4500- SO_4^{2-} E Turbidimetric Method	10	22	200	400	±0.64 mg/l at 19.88 mg/l
15.	Nitrate, mg/l *LDL: 0.5 mg/l*	APHA, 22nd Edition, 4500, B UV-Spectrophotometric Method	5.37	36.00	45	No relaxation	±0.52 mg/l at 20.40 mg/l
16.	Fluoride, mg/l *LDL: 0.02 mg/l*	APHA, 22nd Edition, 4500, F D SPADNS Method	BDL	0.06	1.0	1.5	±0.01 mg/l at 0.97 mg/l
17.	Selenium, mg/l *LDL: 0.002 mg/l*	IS 3025 (Part 37):1988 AAS- VGA Method	BDL	BDL	0.01	No relaxation	±0.81 µg/l at 18.4 µg/l
18.	Arsenic, mg/l *LDL: 0.002 mg/l*	IS 3025 (Part 37):1988 AAS- VGA Method	BDL	BDL	0.01	0.05	±0.81 µg/l at 18.4 µg/l
19.	Lead, mg/l *LDL: 0.005 mg/l*	APHA, 22nd Edition, 3113B, AAS-GTA Method	BDL	BDL	0.01	No relaxation	±0.26 µg/l at 5.09 µg/l
20.	Zinc, mg/l *LDL: 0.01 mg/l*	IS 3025 (Part 49) : 1994, R : 2009, AAS-Flame Method	0.07	0.02	5	15	±0.001 mg/l at 0.011 mg/l
21.	Total Chromium, mg/l *LDL: 0.01 mg/l*	IS 3025 (Part 52):2003 AAS- Flame Method	BDL	BDL	0.05	No relaxation	±0.001 mg/l at 0.008 mg/l
22.	Fecal Coliform, MPN/100 ml	APHA, 22nd Edition, 9221, Multi tube fermentation tech.	NIL	NIL	Nil	No relaxation	---
23.	Boron, mg/l *LDL: 0.2 mg/l*	APHA, 22nd Edition, 4500-B, Carmine Method	BDL	BDL	0.5	1.0	±0.31 mg/l at 5.16 mg/l
24.	Phenolic compounds, mg/l *LDL: 0.002 mg/l*	APHA, 22nd Edition, 5530. C, Chloroform Extraction Method	BDL	BDL	0.001	0.002	±0.020 mg/l at 0.100 mg/l

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K.K.Dhirhi
Lab In-Charge

M. Reagan Singh
Lab Co-ordinator

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DRINKING WATER QUALITY REPORT

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KORBA AREA

Report No

Name of the Customer	South Eastern Coalfields Ltd, Bilaspur			Date of Issue	19.12.2017
Name of the Project	Rajgamar UG	Sample Reference No.	CMPDI/Q9/1220, Dated: 19.09.2017		
Name of the Station	3. Dugwell of Shivcharan Rathiya ,Gangdei	Date of Sampling	18.09.2017	Date of Analysis	
Name of the Station	4. Dugwell of Shyam Lal Aghriya, Basin khar	Date of Sampling	18.09.2017	18.09.2017 to 09.12.2017	

Parameter	Method of Analysis	Observed Value		IS 10500:2012		Uncertainty of Measurement (at 95% C.L & K= 1.96)
		3	4	Acceptable Limit	Permissible Limit in the Absence of Alternate Source	
Colour, Hazen *LDL: 1.0 Hazen*	APHA, 22nd Edition, 2120. C. Spectrometric single wavelength	01	BDL	5	15	±1.05 Hazen at 49.86 Hazen
Odour	IS 3025 (Part 5):1983, Physical (Qualitative)	Agreeable	Agreeable	Agreeable	Agreeable	---
Turbidity, NTU *LDL: 1.0 NTU*	IS 3025 (Part 10):1984, R : 1996, Nephelometric Method	BDL	1.01	1	5	±0.85 NTU at 41.58 NTU
pH *LDL: 3.00*	IS 3025 (Part 11):1983, R : 1996, Electrometric Method	7.06	6.54	6.5-8.5	No relaxation	±0.12 at 7.00
Alkalinity as $CaCO_3$ mg/l *LDL: 5.0 mg/l*	IS 3025(Part 23):1986, Titration Method	55	55	200	600	±0.19 mg/l at 10 mg/l
Total Hardness mg/l as $CaCO_3$ *L: 4.0 mg/l*	IS 3025 (Part 21):2009, EDTA Method	70	28	200	600	±11.54 mg/l at 612.8 mg/l
Iron, mg/l *LDL: 0.06 mg/l*	IS 3025 (Part 53) :2003, AAS-Flame Method	BDL	BDL	0.3	No relaxation	±0.07 mg/l at 7.95 mg/l
Chlorides, mg/l LDL: 0.5 mg/l	IS 3025(Part 32):1988 , R : 2007, Argentometric Method	9.0	10.5	250	1000	±6.55 mg/l at 253.46 mg/l
Residual Free Chlorine, mg/l *LDL: 0.02 mg/l*	APHA, 22nd Edition, 4500G, DPD Colorimetric Method	0.03	0.02	0.2	1	±0.008 mg/l at 0.177 mg/l
Total Dissolved Solids, mg/l *LDL: 30.0 mg/l*	IS 3025 (Part 16):1984 R : 2006, Gravimetric Method	180	99	500	2000	±4.47 mg/l at 592.0 mg/l
Calcium, mg/l *LDL: 2.0 mg/l*	IS 3025 (Part 40): 1991, R : 2009, EDTA Method	9.6	11.2	75	200	±2.51 mg/l at 99.74 mg/l
Copper, mg/l *LDL: 0.03 mg/l*	IS 3025 (Part 42) : 1992 R : 2009, AAS-Flame Method	BDL	BDL	0.05	1.5	±0.13 mg/l at 4.89 mg/l
Manganese, mg/l *LDL: 0.02 mg/l*	IS 3025 (Part 59) : 2006, AAS-Flame Method	0.02	0.05	0.1	0.3	±0.02 mg/l at 2.44 mg/l
Sulphate, mg/l *LDL: 2.0 mg/l*	APHA, 22nd Edition, 4500- SO_4^{2-} E Turbidimetric Method	05	BDL	200	400	±0.64 mg/l at 19.88 mg/l
Nitrate, mg/l *LDL: 0.5 mg/l*	APHA, 22nd Edition, 4500, B UV-Spectrophotometric Method	7.65	22.12	45	No relaxation	±0.52 mg/l at 20.40 mg/l
Fluoride, mg/l *LDL: 0.02 mg/l*	APHA, 22nd Edition, 4500, F- D SPADNS Method	BDL	0.14	1.0	1.5	±0.01 mg/l at 0.97 mg/l
Selenium, mg/l *LDL: 0.002 mg/l*	IS 3025 (Part 37):1988 AAS- VGA Method	BDL	BDL	0.01	No relaxation	±0.81 µg/l at 18.4 µg/l
Arsenic, mg/l *LDL: 0.002 mg/l*	IS 3025 (Part 37):1988 AAS- VGA Method	BDL	BDL	0.01	0.05	±0.81 µg/l at 18.4 µg/l
Lead, mg/l *LDL: 0.005 mg/l*	APHA, 22nd Edition, 3113B, AAS-GTA Method	BDL	BDL	0.01	No relaxation	±0.26 µg/l at 5.09 µg/l
Zinc, mg/l *LDL: 0.01 mg/l*	IS 3025 (Part 49) : 1994, R : 2009, AAS-Flame Method	0.02	0.07	5	15	±0.001 mg/l at 0.011 mg/l
Total Chromium, mg/l *LDL: 0.01 mg/l*	IS 3025 (Part 52):2003 AAS- Flame Method	BDL	BDL	0.05	No relaxation	±0.001 mg/l at 0.098 mg/l
Fecal Coliform, MPN/100 ml	APHA, 22nd Edition, 9221, Multi tube fermentation tech.	NIL	NIL	Nil	No relaxation	---
Boron, mg/l *LDL: 0.2 mg/l*	APHA, 22nd Edition, 4500-B, Carmine Method	BDL	BDL	0.5	1.0	±0.31 mg/l at 5.16 mg/l
Phenolic compounds, mg/l *LDL: 0.002 mg/l*	APHA, 22nd Edition, 5530. C, Chloroform Extraction Method	BDL	BDL	0.001	0.002	±0.020 mg/l at 0.100 mg/l

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DRINKING WATER QUALITY REPORT

KORBA AREA

(5)

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Report No

Name of the Customer	South Eastern Coalfields Ltd, Bilaspur	Date of Issue	19.12.2017
Name of the Project	Rajgamar UG	Sample Reference No.	CMPDI/Q9/1220, Dated: 19.09.2017
Name of the Station	5. Dugwell of Gambhir Singh Rathiya, Kerakhachar	Date of Sampling	18.09.2017 / Date of Analysis
Name of the Station	6. Dugwell of Jagdish, Rajgamar	Date of Sampling	18.09.2017 / 18.09.2017 to 09.12.2017

Sl. No	Parameter	Method of Analysis	Observed Value		IS 10500:2012		Uncertainty of Measurement (at 95% C.L & K= 1.96)
			5	6	Acceptable Limit	Permissible Limit in the Absence of Alternate Source	
1.	Colour, Hazen *LDL: 1.0 Hazen*	APHA, 22nd Edition, 2120. C. Spectrometric single wavelength	01	BDL	5	15	±1.05 Hazen at 49.86 Hazen
2.	Odour	IS 3025 (Part 5):1983, Physical (Qualitative)	Agreeable	Agreeable	Agreeable	Agreeable	---
3.	Turbidity, NTU *LDL: 1.0 NTU*	IS 3025 (Part 10):1984, R : 1996, Nephelometric Method	BDL	1.50	1	5	±0.85 NTU at 41.58 NTU
4.	pH *LDL: 3.00*	IS 3025 (Part 11):1983, R : 1996, Electrometric Method	6.35	6.19	6.5-8.5	No relaxation	±0.12 at 7.00
5.	Alkalinity as $CaCO_3$ mg/l *LDL: 5.0 mg/l*	IS 3025(Part 23):1986, Titration Method	30	25	200	600	±0.19 mg/l at 10 mg/l
6.	Total Hardness mg/l as $CaCO_3$ *LDL: 4.0 mg/l*	IS 3025 (Part 21):2009, EDTA Method	28	44	200	600	±11.54 mg/l at 612.8 mg/l
7.	Iron, mg/l *LDL: 0.06 mg/l*	IS 3025 (Part 53) :2003, AAS-Flame Method	0.08	0.06	0.3	No relaxation	±0.07 mg/l at 7.95 mg/l
8.	Chlorides, mg/l LDL: 0.5 mg/l	IS 3025(Part 32):1988, R : 2007, Argentometric Method	7.0	12.5	250	1000	±6.55 mg/l at 253.46 mg/l
9.	Residual Free Chlorine, mg/l *LDL: 0.02 mg/l*	APHA, 22nd Edition, 4500G, DPD Colorimetric Method	0.03	0.04	0.2	1	±0.008 mg/l at 0.177 mg/l
10.	Total Dissolved Solids, mg/l *LDL: 30.0 mg/l*	IS 3025 (Part 16):1984 R : 2006, Gravimetric Method	91	130	500	2000	±4.47 mg/l at 592.0 mg/l
11.	Calcium, mg/l *LDL: 2.0 mg/l*	IS 3025 (Part 40): 1991, R : 2009, EDTA Method	4.0	7.2	75	200	±2.51 mg/l at 99.74 mg/l
12.	Copper, mg/l *LDL: 0.03 mg/l*	IS 3025 (Part 42) : 1992 R : 2009, AAS-Flame Method	BDL	BDL	0.05	1.5	±0.13 mg/l at 4.89 mg/l
13.	Manganese, mg/l *LDL: 0.02 mg/l*	IS 3025 (Part 59) : 2006, AAS-Flame Method	BDL	0.08	0.1	0.3	±0.02 mg/l at 2.44 mg/l
14.	Sulphate, mg/l *LDL: 2.0 mg/l*	APHA, 22nd Edition, 4500- SO_4^{2-} E Turbidimetric Method	BDL	BDL	200	400	±0.64 mg/l at 19.88 mg/l
15.	Nitrate, mg/l *LDL: 0.5 mg/l*	APHA, 22nd Edition, 4500, B UV-Spectrophotometric Method	17.73	22.85	45	No relaxation	±0.52 mg/l at 20.40 mg/l
16.	Fluoride, mg/l *LDL: 0.02 mg/l*	APHA, 22nd Edition, 4500, F^- D SPADNS Method	0.03	0.08	1.0	1.5	±0.01 mg/l at 0.97 mg/l
17.	Selenium, mg/l *LDL: 0.002 mg/l*	IS 3025 (Part 37):1988 AAS- VGA Method	BDL	BDL	0.01	No relaxation	±0.81 µg/l at 18.4 µg/l
18.	Arsenic, mg/l *LDL: 0.002 mg/l*	IS 3025 (Part 37):1988 AAS- VGA Method	BDL	BDL	0.01	0.05	±0.81 µg/l at 18.4 µg/l
19.	Lead, mg/l *LDL: 0.005 mg/l*	APHA, 22nd Edition, 3113B, AAS-GTA Method	BDL	BDL	0.01	No relaxation	±0.26 µg/l at 5.09 µg/l
20.	Zinc, mg/l *LDL: 0.01 mg/l*	IS 3025 (Part 49) : 1994, R : 2009, AAS-Flame Method	0.01	0.02	5	15	±0.001 mg/l at 0.011 mg/l
21.	Total Chromium, mg/l *LDL: 0.01 mg/l*	IS 3025 (Part 52):2003 AAS- Flame Method	BDL	BDL	0.05	No relaxation	±0.001 mg/l at 0.098 mg/l
22.	Fecal Coliform, MPN/100 ml	APHA, 22nd Edition, 9221, Multi tube fermentation tech.	NIL	NIL	Nil	No relaxation	---
23.	Boron, mg/l *LDL: 0.2 mg/l*	APHA, 22nd Edition, 4500-B, Carmine Method	BDL	BDL	0.5	1.0	±0.31 mg/l at 5.16 mg/l
24.	Phenolic compounds, mg/l *LDL: 0.002 mg/l*	APHA, 22nd Edition, 5530. C, Chloroform Extraction Method	BDL	BDL	0.001	0.002	±0.020 mg/l at 0.100 mg/l

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DRINKING WATER QUALITY REPORT

KORBA AREA

Report No

Name of the Customer	South Eastern Coalfields Ltd, Bilaspur		Date of Issue	19.12.2017
Name of the Project	Rajgamar UG	Sample Reference No.	CMPDI/Q9/1220, Dated: 19.09.2017	
Name of the Station	7.Dugwell of Man Ram Rathiya, Tevanara	Date of Sampling	18.09.2017	Date of Analysis
Name of the Station	8. Dugwell of Mahettar singh Rathiya, Thakurkheta	Date of Sampling	18.09.2017	18.09.2017 to 09.12.2017

	Parameter	Method of Analysis	Observed Value		IS 10500:2012		Uncertainty of Measurement (at 95% C.L & K= 1.96)
			7	8	Acceptable Limit	Permissible Limit in the Absence of Alternate Source	
	Colour, Hazen *LDL: 1.0 Hazen*	APHA, 22nd Edition, 2120. C. Spectrometric single wavelength	BDL	03	5	15	±1.05 Hazen at 49.86 Hazen
	Odour	IS 3025 (Part 5):1983, Physical (Qualitative)	Agreeable	Agreeable	Agreeable	Agreeable	---
	Turbidity, NTU *LDL: 1.0 NTU*	IS 3025 (Part 10):1984, R : 1996, Nephelometric Method	15.85	1.74	1	5	±0.85 NTU at 41.58 NTU
	pH *LDL: 3.00*	IS 3025 (Part 11):1983, R : 1996, Electrometric Method	5.83	6.69	6.5-8.5	No relaxation	±0.12 at 7.00
	Alkalinity as $CaCO_3$ mg/l *LDL: 5.0 mg/l*	IS 3025(Part 23):1986, Titration Method	20	60	200	600	±0.19 mg/l at 10 mg/l
	al Hardness mg/l as $CaCO_3$ *LDL: 4.0 mg/l*	IS 3025 (Part 21):2009, EDTA Method	46	56	200	600	±11.54 mg/l at 612.8 mg/l
	Iron, mg/l *LDL: 0.06 mg/l*	IS 3025 (Part 53) :2003, AAS-Flame Method	0.07	0.07	0.3	No relaxation	±0.07 mg/l at 7.95 mg/l
	Chlorides, mg/l LDL: 0.5 mg/l	IS 3025(Part 32):1988 , R : 2007, Argentometric Method	8.0	5.5	250	1000	±6.55 mg/l at 253.46 mg/l
	Residual Free Chlorine, mg/l *LDL: 0.02 mg/l*	APHA, 22nd Edition, 4500G, DPD Colorimetric Method	0.02	BDL	0.2	1	±0.008 mg/l at 0.177 mg/l
0.	Total Dissolved Solids, mg/l *LDL: 30.0 mg/l*	IS 3025 (Part 16):1984 R : 2006, Gravimetric Method	121	143	500	2000	±4.47 mg/l at 592.0 mg/l
1.	Calcium, mg/l *LDL: 2.0 mg/l*	IS 3025 (Part 40): 1991, R : 2009, EDTA Method	11.2	17.6	75	200	±2.51 mg/l at 99.74 mg/l
2.	Copper, mg/l *LDL: 0.03 mg/l*	IS 3025 (Part 42) : 1992 R : 2009, AAS-Flame Method	BDL	BDL	0.05	1.5	±0.13 mg/l at 4.89 mg/l
3.	Manganese, mg/l *LDL: 0.02 mg/l*	IS 3025 (Part 59) : 2006, AAS-Flame Method	0.02	0.09	0.1	0.3	±0.02 mg/l at 2.44 mg/l
4.	Sulphate, mg/l *LDL: 2.0 mg/l*	APHA, 22nd Edition, 4500- SO_4^{2-} E Turbidimetric Method	10	BDL	200	400	±0.64 mg/l at 19.88 mg/l
5.	Nitrate, mg/l *LDL: 0.5 mg/l*	APHA, 22nd Edition, 4500, B UV-Spectrophotometric Method	21.55	20.00	45	No relaxation	±0.52 mg/l at 20.40 mg/l
6.	Fluoride, mg/l *LDL: 0.02 mg/l*	APHA, 22nd Edition, 4500, F^- D SPADNS Method	BDL	0.04	1.0	1.5	±0.01 mg/l at 0.97 mg/l
7.	Selenium, mg/l *LDL: 0.002 mg/l*	IS 3025 (Part 37):1988 AAS- VGA Method	BDL	BDL	0.01	No relaxation	±0.81 µg/l at 18.4 µg/l
8.	Arsenic, mg/l *LDL: 0.002 mg/l*	IS 3025 (Part 37):1988 AAS- VGA Method	BDL	BDL	0.01	0.05	±0.81 µg/l at 18.4 µg/l
9.	Lead, mg/l *LDL: 0.005 mg/l*	APHA, 22nd Edition, 3113B, AAS-GTA Method	BDL	BDL	0.01	No relaxation	±0.26 µg/l at 5.09 µg/l
0.	Zinc, mg/l *LDL: 0.01 mg/l*	IS 3025 (Part 49) : 1994, R : 2009, AAS-Flame Method	0.11	0.02	5	15	±0.001 mg/l at 0.011 mg/l
1.	Total Chromium, mg/l *LDL: 0.01 mg/l*	IS 3025 (Part 52):2003 AAS- Flame Method	BDL	BDL	0.05	No relaxation	±0.001 mg/l at 0.098 mg/l
2.	Fecal Coliform, MPN/100 ml	APHA, 22nd Edition, 9221, Multi tube fermentation tech.	NIL	NIL	Nil	No relaxation	---
3.	Boron, mg/l *LDL: 0.2 mg/l*	APHA, 22nd Edition, 4500-B, Carmine Method	BDL	BDL	0.5	1.0	±0.31 mg/l at 5.16 mg/l
4.	Phenolic compounds, mg/l *LDL: 0.002 mg/l*	APHA, 22nd Edition, 5530. C, Chloroform Extraction Method	BDL	BDL	0.001	0.002	±0.020 mg/l at 0.100 mg/l

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DRINKING WATER QUALITY REPORT

KORBA AREA

Report No

Name of the Customer	South Eastern Coalfields Ltd, Bilaspur		Date of Issue	19.12.2017
Name of the Project	Rajgamar UG	Sample Reference No.	CMPDI/Q9/1220, Dated: 19.09.2017	
Name of the Station	9.Dugwell of Soniro Bhai, Newahih	Date of Sampling	18.09.2017	Date of Analysis
Name of the Station	10. Dugwell near primary school, Patarapali	Date of Sampling	18.09.2017	18.09.2017 to 09.12.2017

S. No.	Parameter	Method of Analysis	Observed Value		IS 10500:2012		Uncertainty of Measurement (at 95% C.L & K= 1.96)
			9	10	Acceptable Limit	Permissible Limit in the Absence of Alternate Source	
	Colour, Hazen *LDL: 1.0 Hazen*	APHA, 22nd Edition, 2120. C. Spectrometric single wavelength	04	07	5	15	±1.05 Hazen at 49.86 Hazen
	Odour	IS 3025 (Part 5):1983, Physical (Qualitative)	Agreeable	Agreeable	Agreeable	Agreeable	---
	Turbidity, NTU *LDL: 1.0 NTU*	IS 3025 (Part 10):1984, R : 1996, Nephelometric Method	BDL	BDL	1	5	±0.85 NTU at 41.58 NTU
	pH *LDL: 3.00*	IS 3025 (Part 11):1983, R : 1996, Electrometric Method	6.57	6.07	6.5-8.5	No relaxation	±0.12 at 7.00
	Alkalinity as $CaCO_3$mg/l *LDL: 5.0 mg/l*	IS 3025(Part 23):1986, Titration Method	75	30	200	600	±0.19 mg/l at 10 mg/l
	tal Hardness mg/l as $CaCO_3$ *L: 4.0 mg/l*	IS 3025 (Part 21):2009, EDTA Method	102	44	200	600	±11.54 mg/l at 612.8 mg/l
	Iron, mg/l *LDL: 0.06 mg/l*	IS 3025 (Part 53) :2003, AAS-Flame Method	0.07	0.07	0.3	No relaxation	±0.07 mg/l at 7.95 mg/l
	Chlorides, mg/l LDL: 0.5 mg/l	IS 3025(Part 32):1988 , R : 2007, Argentometric Method	11.0	5.5	250	1000	±6.55 mg/l at 253.46 mg/l
	Residual Free Chlorine, mg/l *LDL: 0.02 mg/l*	APHA, 22nd Edition, 4500G, DPD Colorimetric Method	0.03	BDL	0.2	1	±0.008 mg/l at 0.177 mg/l
10.	Total Dissolved Solids, mg/l *LDL: 30.0 mg/l*	IS 3025 (Part 16):1984 R : 2006, Gravimetric Method	261	76	500	2000	±4.47 mg/l at 592.0 mg/l
11.	Calcium., mg/l *LDL: 2.0 mg/l*	IS 3025 (Part 40): 1991, R : 2009, EDTA Method	31.2	6.4	75	200	±2.51 mg/l at 99.74 mg/l
12.	Copper, mg/l *LDL: 0.03 mg/l*	IS 3025 (Part 42) : 1992 R : 2009, AAS-Flame Method	BDL	BDL	0.05	1.5	±0.13 mg/l at 4.89 mg/l
13.	Manganese, mg/l *LDL: 0.02 mg/l*	IS 3025 (Part 59) : 2006, AAS-Flame Method	0.06	0.1	0.1	0.3	±0.02 mg/l at 2.44 mg/l
14.	Sulphate, mg/l *LDL: 2.0 mg/l*	APHA, 22nd Edition, 4500- SO_4^{2-} E Turbidimetric Method	03	BDL	200	400	±0.64 mg/l at 19.88 mg/l
15.	Nitrate, mg/l *LDL: 0.5 mg/l*	APHA, 22nd Edition, 4500, B UV-Spectrophotometric Method	29.42	5.82	45	No relaxation	±0.52 mg/l at 20.40 mg/l
16.	Fluoride, mg/l *LDL: 0.02 mg/l*	APHA, 22nd Edition, 4500, F D SPADNS Method	0.13	0.04	1.0	1.5	±0.01 mg/l at 0.97 mg/l
17.	Selenium, mg/l *LDL: 0.002 mg/l*	IS 3025 (Part 37):1988 AAS- VGA Method	BDL	BDL	0.01	No relaxation	±0.81 µg/l at 18.4 µg/l
	rsenic, mg/l *LDL: 0.002 mg/l*	IS 3025 (Part 37):1988 AAS- VGA Method	BDL	BDL	0.01	0.05	±0.81 µg/l at 18.4 µg/l
19.	Lead, mg/l *LDL: 0.005 mg/l*	APHA, 22nd Edition, 3113B, AAS-GTA Method	BDL	BDL	0.01	No relaxation	±0.26 µg/l at 5.09 µg/l
20.	Zinc, mg/l *LDL: 0.01 mg/l*	IS 3025 (Part 49) : 1994, R : 2009, AAS-Flame Method	0.04	0.04	5	15	±0.001 mg/l at 0.011 mg/l
21	Total Chromium, mg/l *LDL: 0.01 mg/l*	IS 3025 (Part 52):2003 AAS- Flame Method	BDL	BDL	0.05	No relaxation	±0.001 mg/l at 0.098 mg/l
22.	Fecal Coliform, MPN/100 ml	APHA, 22nd Edition, 9221, Multi tube fermentation tech.	NIL	NIL	Nil	No relaxation	---
23.	Boron, mg/l *LDL: 0.2 mg/l*	APHA, 22nd Edition, 4500-B, Carmine Method	BDL	BDL	0.5	1.0	±0.31 mg/l at 5.16 mg/l
24.	Phenolic compounds, mg/l *LDL: 0.002 mg/l*	APHA, 22nd Edition, 5530. C, Chloroform Extraction Method	BDL	BDL	0.001	0.002	±0.020 mg/l at 0.100 mg/l

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DRINKING WATER QUALITY REPORT

KORBA AREA

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Report No

Name of the Customer	South Eastern Coalfields Ltd, Bilaspur		Date of Issue	19.12.2017
Name of the Project	Rajgamar UG	Sample Reference No.	CMPDI/Q9/1220, Dated: 19.09.2017	
Name of the Station	11.Dugwell near Suna Ram, Chhuhidhora	Date of Sampling	18.09.2017	Date of Analysis
Name of the Station	12. Dugwell of Ram Lal, Amadand	Date of Sampling	18.09.2017	18.09.2017 to 09.12.2017

	Parameter	Method of Analysis	Observed Value		IS 10500:2012		Uncertainty of Measurement (at 95% C.L & K= 1.96)
			11	12	Acceptable Limit	Permissible Limit in the Absence of Alternate Source	
	Colour, Hazen *LDL: 1.0 Hazen*	APHA, 22nd Edition, 2120. C. Spectrometric single wavelength	70	15	5	15	±1.05 Hazen at 49.86 Hazen
	Odour	IS 3025 (Part 5):1983, Physical (Qualitative)	Agreeable	Agreeable	Agreeable	Agreeable	---
	Turbidity, NTU *LDL: 1.0 NTU*	IS 3025 (Part 10):1984, R : 1996, Nephelometric Method	2.67	1.32	1	5	±0.85 NTU at 41.58 NTU
	pH *LDL: 3.00*	IS 3025 (Part 11):1983, R : 1996, Electrometric Method	6.83	6.53	6.5-8.5	No relaxation	±0.12 at 7.00
	Alkalinity as $CaCO_3$ mg/l *LDL: 5.0 mg/l*	IS 3025(Part 23):1986, Titration Method	115	155	200	600	±0.19 mg/l at 10 mg/l
	Total Hardness mg/l as $CaCO_3$ *LDL: 4.0 mg/l*	IS 3025 (Part 21):2009, EDTA Method	122	196	200	600	±11.54 mg/l at 612.8 mg/l
	Iron, mg/l *LDL: 0.06 mg/l*	IS 3025 (Part 53) :2003, AAS-Flame Method	0.06	0.06	0.3	No relaxation	±0.07 mg/l at 7.95 mg/l
	Chlorides, mg/l LDL: 0.5 mg/l	IS 3025(Part 32):1988 , R : 2007, Argentometric Method	16.0	73.0	250	1000	±6.55 mg/l at 253.46 mg/l
	Residual Free Chlorine, mg/l *LDL: 0.02 mg/l*	APHA, 22nd Edition, 4500G, DPD Colorimetric Method	0.05	0.02	0.2	1	±0.008 mg/l at 0.177 mg/l
0.	Total Dissolved Solids, mg/l *LDL: 30.0 mg/l*	IS 3025 (Part 16):1984 R : 2006, Gravimetric Method	311	679	500	2000	±4.47 mg/l at 592.0 mg/l
1.	Calcium, mg/l *LDL: 2.0 mg/l*	IS 3025 (Part 40): 1991, R : 2009, EDTA Method	30.4	32	75	200	±2.51 mg/l at 99.74 mg/l
2.	Copper, mg/l *LDL: 0.03 mg/l*	IS 3025 (Part 42) : 1992 R : 2009, AAS-Flame Method	BDL	BDL	0.05	1.5	±0.13 mg/l at 4.89 mg/l
3.	Manganese, mg/l *LDL: 0.02 mg/l*	IS 3025 (Part 59) : 2006, AAS-Flame Method	0.09	0.02	0.1	0.3	±0.02 mg/l at 2.44 mg/l
4.	Sulphate, mg/l *LDL: 2.0 mg/l*	APHA, 22nd Edition, 4500- SO_4^{2-} E Turbidimetric Method	14	20	200	400	±0.64 mg/l at 19.88 mg/l
5.	Nitrate, mg/l *LDL: 0.5 mg/l*	APHA, 22nd Edition, 4500, B UV-Spectrophotometric Method	0.92	18.52	45	No relaxation	±0.52 mg/l at 20.40 mg/l
6.	Fluoride, mg/l *LDL: 0.02 mg/l*	APHA, 22nd Edition, 4500, F D SPADNS Method	BDL	0.30	1.0	1.5	±0.01 mg/l at 0.97 mg/l
7.	Selenium, mg/l *LDL: 0.002 mg/l*	IS 3025 (Part 37):1988 AAS- VGA Method	BDL	BDL	0.01	No relaxation	±0.81 µg/l at 18.4 µg/l
	rsenic, mg/l *LDL: 0.002 mg/l*	IS 3025 (Part 37):1988 AAS- VGA Method	BDL	BDL	0.01	0.05	±0.81 µg/l at 18.4 µg/l
9.	Lead, mg/l *LDL: 0.005 mg/l*	APHA, 22nd Edition, 3113B, AAS-GTA Method	BDL	BDL	0.01	No relaxation	±0.26 µg/l at 5.09 µg/l
0.	Zinc, mg/l *LDL: 0.01 mg/l*	IS 3025 (Part 49) : 1994, R : 2009, AAS-Flame Method	0.09	0.02	5	15	±0.001 mg/l at 0.011 mg/l
1.	Total Chromium, mg/l *LDL: 0.01 mg/l*	IS 3025 (Part 52):2003 AAS- Flame Method	BDL	BDL	0.05	No relaxation	±0.001 mg/l at 0.098 mg/l
2.	Fecal Coliform, MPN/100 ml	APHA, 22nd Edition, 9221, Multi tube fermentation tech.	NIL	NIL	Nil	No relaxation	---
3.	Boron, mg/l *LDL: 0.2 mg/l*	APHA, 22nd Edition, 4500-B, Carmine Method	BDL	BDL	0.5	1.0	±0.31 mg/l at 5.16 mg/l
4.	Phenolic compounds, mg/l *LDL: 0.002 mg/l*	APHA, 22nd Edition, 5530. C, Chloroform Extraction Method	BDL	BDL	0.001	0.002	±0.020 mg/l at 0.100 mg/l

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DRINKING WATER QUALITY REPORT

KORBA AREA

Report No

Name of the Customer	South Eastern Coalfields Ltd, Bilaspur	Date of Issue	19.12.2017
Name of the Project	Rajgamar UG	Sample Reference No.	CMPDI/Q9/1220, Dated: 19.09.2017
Name of the Station	13.Dugwell of Dasi Ram, Dengurdih	Date of Sampling	18.09.2017
Name of the Station	14. Dugwell of Jagdish Vishwakarma, Korkoma	Date of Sampling	18.09.2017

Date of Analysis: 18.09.2017 to 09.12.2017

Sl. No	Parameter	Method of Analysis	Observed Value		IS 10500:2012		Uncertainty of Measurement (at 95% C.L & K= 1.96)
			13	14	Acceptable Limit	Permissible Limit in the Absence of Alternate Source	
1.	Colour, Hazen *LDL: 1.0 Hazen*	APHA, 22nd Edition, 2120. C. Spectrometric single wavelength	06	07	5	15	±1.05 Hazen at 49.86 Hazen
2.	Odour	IS 3025 (Part 5):1983, Physical (Qualitative)	Agreeable	Agreeable	Agreeable	Agreeable	---
3.	Turbidity, NTU *LDL: 1.0 NTU*	IS 3025 (Part 10):1984, R : 1996, Nephelometric Method	15.83	1.49	1	5	±0.85 NTU at 41.58 NTU
4.	pH *LDL: 3.00*	IS 3025 (Part 11):1983, R : 1996, Electrometric Method	6.84	6.54	6.5-8.5	No relaxation	±0.12 at 7.00
5.	Alkalinity as $CaCO_3$ mg/l *LDL: 5.0 mg/l*	IS 3025(Part 23):1986, Titration Method	105	105	200	600	±0.19 mg/l at 10 mg/l
6.	Total Hardness mg/l as $CaCO_3$ *L: 4.0 mg/l*	IS 3025 (Part 21):2009, EDTA Method	130	140	200	600	±11.54 mg/l at 612.8 mg/l
7.	Iron, mg/l *LDL: 0.06 mg/l*	IS 3025 (Part 53) :2003, AAS-Flame Method	0.06	0.07	0.3	No relaxation	±0.07 mg/l at 7.95 mg/l
8.	Chlorides, mg/l LDL: 0.5 mg/l	IS 3025(Part 32):1988 , R : 2007, Argentometric Method	42.0	23.0	250	1000	±6.55 mg/l at 253.46 mg/l
9.	Residual Free Chlorine, mg/l *LDL: 0.02 mg/l*	APHA, 22nd Edition, 4500G, DPD Colorimetric Method	0.03	BDL	0.2	1	±0.008 mg/l at 0.177 mg/l
10.	Total Dissolved Solids, mg/l *LDL: 30.0 mg/l*	IS 3025 (Part 16):1984 R : 2006, Gravimetric Method	543	371	500	2000	±4.47 mg/l at 592.0 mg/l
11.	Calcium, mg/l *LDL: 2.0 mg/l*	IS 3025 (Part 40): 1991, R : 2009, EDTA Method	70.4	38.4	75	200	±2.51 mg/l at 99.74 mg/l
12.	Copper, mg/l *LDL: 0.03 mg/l*	IS 3025 (Part 42) : 1992 R : 2009, AAS-Flame Method	BDL	BDL	0.05	1.5	±0.13 mg/l at 4.89 mg/l
13.	Manganese, mg/l *LDL: 0.02 mg/l*	IS 3025 (Part 59) : 2006, AAS-Flame Method	BDL	0.03	0.1	0.3	±0.02 mg/l at 2.44 mg/l
14.	Sulphate, mg/l *LDL: 2.0 mg/l*	APHA, 22nd Edition, 4500- SO_4^{2-} E Turbidimetric Method	19	05	200	400	±0.64 mg/l at 19.88 mg/l
15.	Nitrate, mg/l *LDL: 0.5 mg/l*	APHA, 22nd Edition, 4500, B UV-Spectrophotometric Method	31.00	25.10	45	No relaxation	±0.52 mg/l at 20.40 mg/l
16.	Fluoride, mg/l *LDL: 0.02 mg/l*	APHA, 22nd Edition, 4500, F^- D SPADNS Method	0.39	0.97	1.0	1.5	±0.01 mg/l at 0.97 mg/l
17.	Selenium, mg/l *LDL: 0.002 mg/l*	IS 3025 (Part 37):1988 AAS- VGA Method	BDL	BDL	0.01	No relaxation	±0.81 µg/l at 18.4 µg/l
18.	Arsenic, mg/l *LDL: 0.002 mg/l*	IS 3025 (Part 37):1988 AAS- VGA Method	BDL	BDL	0.01	0.05	±0.81 µg/l at 18.4 µg/l
19.	Lead, mg/l *LDL: 0.005 mg/l*	APHA, 22nd Edition, 3113B, AAS-GTA Method	BDL	BDL	0.01	No relaxation	±0.26 µg/l at 5.09 µg/l
20.	Zinc, mg/l *LDL: 0.01 mg/l*	IS 3025 (Part 49) : 1994, R : 2009, AAS-Flame Method	0.01	0.01	5	15	±0.001 mg/l at 0.011 mg/l
21.	Total Chromium, mg/l *LDL: 0.01 mg/l*	IS 3025 (Part 52):2003 AAS- Flame Method	BDL	BDL	0.05	No relaxation	±0.001 mg/l at 0.098 mg/l
22.	Fecal Coliform, MPN/100 ml	APHA, 22nd Edition, 9221, Multi tube fermentation tech.	NIL	NIL	Nil	No relaxation	---
23.	Boron, mg/l *LDL: 0.2 mg/l*	APHA, 22nd Edition, 4500-B, Carmine Method	BDL	BDL	0.5	1.0	±0.31 mg/l at 5.16 mg/l
24.	Phenolic compounds, mg/l *LDL: 0.002 mg/l*	APHA, 22nd Edition, 5530. C, Chlo. oform Extraction Method	BDL	BDL	0.001	0.002	±0.020 mg/l at 0.100 mg/l

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