

**ENVIRONMENTAL STATEMENT  
IN  
FORM-V**

(Under Rule-14, Environmental (Protection) Rules, 1986)

**(2020-2021)**

**FOR  
RAJMAHAL OCP  
(OPENCAST PROJECT)  
Rajmahal Area  
Eastern Coalfields Limited**

Prepared at  
Regional Institute – I  
**Central Mine Planning & Design Institute Ltd.**  
(A Subsidiary of Coal India Ltd.)  
G. T. Road (West End)  
Asansol - 713 304



Coal India Limited  
A Maharatna Company  
www.coalindia.in

**CMPDI**

ISO 9001:2015 Company

**ENVIRONMENTAL STATEMENT FOR  
RAJMAHAL OPENCAST PROJECT**

**FOR THE YEAR: 2020-2021**

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## CHAPTER – I

### INTRODUCTION

#### 1.1 GENESIS:

The Gazette Notification vide G.S.R No. 329 (E) dated 13<sup>th</sup> March, 1992 and subsequently renamed to 'Environmental Statement' vide Ministry of Environment, Forests & Climate Change (MoEF & CC), Govt. of India gazette notification No. G.S.R No. 386 (E) Dtd. 22<sup>nd</sup> April '93 reads as follows.

"Every person carrying on an industry, operation or process requiring consent under section 25 of the Water Act, 1974 or under section 21 of the Air Act, 1981 or both or authorization under the Hazardous Waste Rules, 1989 issued under the Environmental Protection Act, 1986 shall submit an Environmental Audit Report for the year ending 31<sup>st</sup> March in Form V to the concerned State Pollution Control Board on or before the 30<sup>th</sup> day of September every year."

In compliance with the above, the work of Environmental Statement for Rajmahal Opencast Project was entrusted to CMPDI by GM (Environment & Forest), Eastern Coalfields Limited.

#### 1.2 PROJECT DESCRIPTION:

The mining technology for 17.0 MTY rated capacity is under implementation. As per the proposed technology, the parting between seam-II (bot) and seam-II (top) and the parting between seam-II (top) and seam-III is being extracted by 12m<sup>3</sup>-14m<sup>3</sup> Hydraulic shovel where these are thin and by 10 m<sup>3</sup> Rope shovel where the parting thickness exceeds 5 m in conjunction with 85T/100T rear dumper (coal body). 10 m<sup>3</sup> Rope shovel later on will be replaced by 12m<sup>3</sup>-14m<sup>3</sup> Hydraulic shovel.

The balance consolidated OB and unconsolidated OB above seam-III will be mainly excavated by 20 m<sup>3</sup> long reach / non-long reach rope shovels in conjunction with 170 T upgraded (190 T) electric wheel dumper. Hydraulic Backhoe will also be utilized for removal of OB/inter-burdens/bands.

Coal production is proposed to be done by 12-14 m<sup>3</sup> hydraulic shovel and 5 Cu.m. Hyd. Backhoe with 85 T upgraded (100 Te) coal body dumpers. The coal dumpers will transport ROM coal to the in-pit crusher and from there coal will be transported to silos by conveyors. Efforts will be made to remove in-seam bands which are more than 1m thick by selective mining. For thin bands of less than 1m thick, dozing after light blasting by small drills (100 mm) provided in the P.R has been envisaged. Hydraulic backhoe has been provided in the P.R for loading of these bands as well as for excavating the thicker bands by selective mining. Wheel dozers have been provided for cleaning of coal seam roofs.

Present depth of mine varies from 60 m to 155 m.

Total manpower as on 31.03.2021 was 2154 and total number of working days were 365. EC was granted for Rajmahal OCP vide letter no. J-11015/30/2004-IA.II (M) dated 11.05.2005 for a production capacity of 17.0 MTY in a ML area of 1978.0 Ha. Revalidation of EC based on MoEF&CC notification dated 06.04.2018 was granted vide even letter no. dated 22.01.2020. One time capacity expansion of 40% under Clause 7 (ii) of EIA Notification, 2006 was granted to Rajmahal (Expansion) OCP vide even letter no. dated 20.03.2020 for a capacity of 23.80 MTY in a ML area of 1978.0 Ha. This Environmental Statement report has been prepared based on the EC dated 23.80 MTY.

### 1.2.1 COMMUNICATION:

The Rajmahal Opencast Project lies at a distance of about 30 km from Godda on Godda-Pirpainti Road.

Rajmahal opencast project lies at a distance of about 30 Km. from Godda on Godda Pirpainti Road. The project is under the administrative control of G.M, Rajmahal Group of Mines of ECL. The nearest railway station is Pirpainti of Eastern Railway at about 30 Km. North of the Block.

The location map of the Rajmahal Opencast Project is given in Plate-I.

### 1.2.2 SALIENT FEATURES AS PER EMP:

1	Rated capacity per annum	23.80 MT
2	Total Block Area	1978.0 Ha
3	Forest land	107.39 Ha
4	Mineable reserve	185.50 MT
5	Balance life of mine	9 Years
6	Average stripping ratio	2.14 cum/te

### 1.3 ENVIRONMENTAL SCENARIO:

The Environmental monitoring was carried out quarterly as per guidelines of Ministry of Environment, Forests & Climate Change (MoEF & CC) by CMPDI, RI-I starting from Q/E June'1995. Accordingly, ambient air quality was monitored at four stations including Railway Siding. The details of the sampling stations are given below:

Project	Station code	Monitoring Station
Rajmahal OCP	16A1	Mine Dispatch Building
Rajmahal OCP	16A2	CISF Camp
Rajmahal OCP	16A3	Urjanagar Hospital
Rajmahal OCP	16A4	Rajmahal Area Office

Till January'20, the monitoring was carried out at ECL Rest House at Pirpainti Market. However, from February'20 onwards, monitoring is being carried out at Rajmahal Area Office. Water quality was monitored according to effluent discharge at 5 locations. Noise levels were recorded at four locations earmarked for ambient air sampling.

However, the monitoring schedule has been changed from September, 2016.

1 no. of piezometer is installed at Rajmahal old Workshop. Groundwater level is monitored at 4 nos. of dugwells located in surrounding villages in each quarter i.e., May, August, November and January. All groundwater quality parameters are analysed once in a year during May as per the IS 10500: 2012 standard.

The environmental monitoring results for the year ending March'2021 are appended as Annexure- I, II, III and IV. The environmental monitoring results for the year 2020-21 can be concluded as given below:

#### AMBIENT AIR QUALITY

The PM<sub>10</sub> concentration at industrial locations was found in the range of 78.9 to 278.3 µg/m<sup>3</sup> and was within the limits during the year as per GSR 742 (E) dated 25.09.2000 while the PM<sub>10</sub> concentration at residential location was found in the range of 74.6 to 116.8 µg/m<sup>3</sup> and has exceeded the limits on 1 occasion out of 22 samples analysed during the year as per NAAQS, 2009. The PM<sub>2.5</sub> concentration was found in the range of 26.2 to 132.8 µg/m<sup>3</sup> and has exceeded the limits on 5

occasions out of 88 samples analysed during the year as per NAAQS, 2009. However, no limit for PM<sub>2.5</sub> is prescribed in GSR 742 (E) dated 25.09.2000. The SO<sub>2</sub> concentration remained less than 10.0 µg/m<sup>3</sup> and NO<sub>x</sub> concentration was in the range of 12.3 to 19.8 µg/m<sup>3</sup> and was within the limits as per the standard.

### **ENVIRONMENTAL STANDARDS:**

Environmental Standards for Ambient Air Quality (AAQ):

<b>Station Category</b>	<i>Environmental standard for Raniganj Coalfield vide MoEF, Govt. of India, Gazette Notification No. GSR 742 (E) dated 25.09.2000 for 24 hourly samples at 500 meters from dust generating point</i>			<i>National Ambient Air Quality Standards (NAAQS), 2009 for industrial, residential and rural areas for 24 hours samples</i>
	<b>Pollutant Concentration (µg/m<sup>3</sup>)</b>			
	<b>PM<sub>10</sub></b>	<b>SO<sub>2</sub></b>	<b>NO<sub>x</sub></b>	<b>PM<sub>2.5</sub></b>
Industrial	300.0	120.0	120.0	60.0
Residential	100.00	80.0	80.0	

### **WATER QUALITY**

Ground water percolates into working area from the surrounding aquifers which have been exposed due to opencast mining. The mine is dewatered regularly to maintain dry working conditions. This mine discharge water is partly utilized for dust suppression by sprinkling at coal faces and on haul roads. Part-B of the Environmental Statement proforma contains the detailed break-up of water consumption.

The analysis results reveal that most of the parameters are below permissible limits prescribed in Indian drinking water standard (IS-10500:2012) & Effluent water MoEF & CC Schedule VI Standard.

Mine water, drinking water and ground water analysis results are given in Annexure-III.

Ground water level are given in Annexure-IV.

### **NOISE LEVEL**

The noise level at industrial stations was found in the range of 48.2 to 83.87 dB(A) and has exceeded the limits on 4 occasions out of 30 samples measured while the noise level at hospital location was found in the range of 46.2 to 86.83 dB(A) and has exceeded the limits on 8 occasions out of 10 samples measured. The noise level recorded is below permissible limit prescribed by Ministry of Environment and Forest. Noise Level Standard as per Noise Pollution (Regulation and Control) Rules, 2000 for different station categories is given below:

Station Category	Limits for noise (Leq dB (A))	
	Day Time (6am-10pm)	Night Time (10pm-6am)
Industrial	75.0	70.0
Commercial	65.0	55.0
Residential	55.0	45.0
Silence Zone	50.0	40.0

**CHAPTER - II**  
**ENVIRONMENTAL STATEMENT FORM – V**  
 Environmental statement for the financial year ending March, 2021

**PART – A**

SL. NO.	HEADING	PARTICULARS
(I)	<b>NAME AND ADDRESS OF THE PROJECT</b>	Name : RAJMAHAL OPENCAST PROJECT Address: AGENT, Rajmahal OCP, P.O. – Lalmatia, Dist. – Godda (Jharkhand) – 814165
(II)	<b>INDUSTRY CATEGORY</b>	Red
(III)	<b>PRODUCTION CAPACITY</b>	23.80 MTY
	<b>PRODUCTION DURING 2020-21</b>	15.74 MT
(IV)	<b>YEAR OF ESTABLISHMENT</b>	1992
(V)	<b>DATE OF THE LAST ENVIRONMENTAL STATEMENT SUBMITTED</b>	September, 2020

**PART – B**

**WATER AND RAW MATERIAL CONSUMPTION**

**(I) WATER CONSUMPTION (Cu.m/day)**

Mine water

- a. Total quantity of mine pumping during 2020 – 21 : 14244.0 m<sup>3</sup>/day
- b. Quantity of mine water utilized along with purpose : 3570.0 m<sup>3</sup>/day  
(for industrial use only)
- c. Quantity of mine water supplied to others: 10674.0 m<sup>3</sup>/day
- d. Quantity of mine water discharged outside: Nil m<sup>3</sup>
- e. Place of discharge: Discharged mine water after passing through sedimentation tanks is stored in the Kendua Pond where secondary sedimentation occurs. From here, the water is reused for firefighting, local agricultural use and dust suppression.

Other water sources

- a. Name of source: Ground water (Wells/Tube wells at Urjanagar colony)
- b. Total quantity of water drawn along with purpose during 2020 – 21: 1030.0 m<sup>3</sup>/day for domestic purpose only.

Sl. No.	Particulars	2019-20	2020-21
<b>A. MINING (total)</b>			
i	Dust suppression	3965.0	3570.0
ii	Fire fighting		
iii	Others (service building etc.)		
<b>B. COOLING</b> (in radiators of trucks/HEMM/workshop)			
<b>C. DOMESTIC</b>			
i	Colony (Ground water)	875.0	1030.0
<b>TOTAL</b>		<b>4840.0</b>	<b>4600.0</b>

Name of Product	Process water consumption per unit of product output (l/day/te)	
	2019-20	2020-21
Coal	0.23	0.23

**(II) RAW MATERIAL CONSUMPTION:**

Name of raw material	Name of products	Consumption of raw material (per unit product)	
		During previous financial year (2019-20)	During current financial year (2020-21)
1. Explosive	Coal and OB	0.29 kg/te	0.40 kg/te
2. Diesel		1.33 l/te	0.45 l/te
3. Lubricants		0.01 l/te	0.01 l/te

**PART – C  
POLLUTION GENERATED**

Pollution	Quantity of pollutants discharged (mass/day)	Concentrations of pollutants discharged (mass/volume)	Percentage variation from prescribed standards with reasons
WATER	-	1. Mine water discharge Analysis results are given in Annexure-III.	1. The analysis results reveal that most of the parameters are below permissible limits prescribed by MOEF as General Standards for class 'A' effluent (Effluent discharged into inland surface water).
AIR*	Total pollutant load of PM <sub>10</sub> is 10652.43 kg/day while it is 4289.96 kg/day for PM <sub>2.5</sub> .	2. The main air pollutant is suspended PM <sub>10</sub> and PM <sub>2.5</sub> . The air quality results are appended as Annexure-I.	2. Ambient air quality results show that the values of PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> and NO <sub>x</sub> are within the prescribed standards barring few occasions when the values have exceeded the limits as explained in the earlier section.

\*PM<sub>10</sub> and PM<sub>2.5</sub> estimation has been done using empirical formula by using Emission Factors derived from S&T studies done by CMPDI.

**PART – D  
HAZARDOUS WASTE  
(As specified under Hazardous waste  
Management and Handling Rules, 1989)**

Hazardous waste	Total quantity		Disposal method
	During previous financial year (2019-20)	During current financial year (2020-21)	
A) From process			Dealt in Part – F
i) Used oil	131.01 KL	72.87 KL	
ii) Lead-Acid Batteries			
a. Automobile batteries	81 nos.	Nil	
b. Cap-lamp batteries	NA	NA	
iii) Used Cotton waste	3350 kg	-	
iv) Metal Scrap	-	-	

**NOTE :**

- a) The details of used oil is to be given to concerned Pollution Control Board in Form-13 as per time mentioned in HW(M&H), amendment Rules, 2003.
- b) The detail of disposal of acid batteries is to be given to concerned State Pollution Control Board in Form-III as per time mentioned in batteries (M&H) Rules, 2001.

**PART – E  
SOLID WASTE**

Particulars	Total quantity (In Million Cu.m)	
	During previous financial year (2019-20)	During current financial year (2020-21)
a) From process (Mining)	26.55	21.60
b) From pollution control facilities	-	-
c) Quantity recycled or reutilized (back filled)	26.55	21.60

**PART – F**

**PLEASE SPECIFY THE CHARACTERISTICS (IN TERMS OF CONCENTRATION AND QUANTUM) OF HAZARDOUS AS WELL AS SOLID WASTE AND INDICATE THE DISPOSAL PRACTICE ADOPTED FOR BOTH THESE CATEGORIES OF WASTE.**

Quantity of hazardous wastes generated has been dealt in Part – D of this statement. Used oil is sent to other collieries for reuse as well as stored safely in steel barrels and auctioning is done periodically. Used batteries are issued to scrap auctioneers against delivery order issued from ECL Headquarters through MSTC. Used cotton waste is disposed of safely within mine lease in a structure consisting of proper liner to prevent groundwater contamination.

**PART – G**

**IMPACT OF POLLUTION CONTROL MEASURES ON CONSERVATION OF NATURAL RESOURCES AND CONSEQUENTLY ON COST OF PRODUCTION.**

In order to carry out mining in an eco-friendly manner, following pollution control measures have been implemented.

**1.0 AIR POLLUTION CONTROL MEASURES :**

The Practices of control, monitoring and recording of dust emissions are followed at the project.

- a) Efficient dust extraction and suppression system has been provided at the Coal Handling Plant and is being properly operated and maintained. Coal is transported through conveyor belts to Silo and from there to railway siding using MGR.
- b) Static & Mobile Water Sprinklers, Mist Gun, Sensor based dust suppression system has been provided in the mine as well as CHP.
- c) Dust extractors are provided with drills and they are fully functional during drilling operation.
- d) Personnel working in dusty areas have been given adequate training and information on health and safety aspects and to wear protective respiratory devices.
- e) Routine Monitoring of Ambient Air Quality is being carried out fortnightly by CMPDI and corrective action, if so needed, will be taken by the Management.
- f) Sufficient nos. of mobile sprinklers and fixed sprinklers have been provided within the mine site and at CHP for dust suppression.
- g) Surface miner (a modern technology with minimal impact on environment) is also used during production to reduce impact on air quality.
- h) Plantation work is regularly being carried out as per the programme. Total plantation over external dump, internal dump/backfilled area and other area

within the ML during 2020-21 was 20.0 Ha, 230.0 Ha and 216.0 Ha respectively with local species like mango, Neem, Gulmohar, Peepal, Amaltash, Chatvan, seesham and kadam with survival rate of more than 80%.

## **2.0 WATER POLLUTION CONTROL MEASURES :**

- a) Settling tanks have been provided for settling of TSS in Mine Water before discharge into local nallah. Oil and Grease traps have been provided for discharge of effluents from Workshop. They are properly maintained and if necessary, such type of additional arrangements will be provided in the future. 1 no. of ETP has also been provided in the workshop for treating workshop discharge water.
- b) Filtration unit is also provided within the mine lease to filter mine water before supply.
- c) Routine water quality analysis is being carried out by CMPDI, RI – I and necessary actions will be taken, if required.

## **3.0 NOISE POLLUTION CONTROL MEASURES**

- a) Regular maintenance of HEMM and other equipment.
- b) Persons engaged in blasting and drilling operations and operation of HEMM have been provided with ear plugs/muffs.
- c) Providing green belt around Workshop, CHP etc. help in checking the noise level.

## **4.0 LAND RESOURCE MANAGEMENT**

- a) 21.60 Mm<sup>3</sup> of OB has been internally dumped within the quarried area during 2020-21.

### **PART – H**

#### **ADDITIONAL INVESTMENT PROPOSALS FOR ENVIRONMENTAL PROTECTION INCLUDING ABATEMENT OF POLLUTION.**

The following are the additional investment proposal for environmental protection:

- a) The Environmental monitoring of the project will be continued fortnightly as per the guidelines of Ministry of Environment, Forests & Climate Change (MoEF & CC).
- b) Plantation will be carried out as per the proposed plan. The plantation work will be of block type 3-tier plantation as per MoEF&CC guidelines comprising of grass, shrubs and trees having thick lower, middle and top canopy. The saplings will be of native/indigenous species.
- c) Various activities have been undertaken under CSR. Total amount spent on CSR during FY 2020-21 was ₹ 1.52 Crores.

### **PART – I**

#### **ANY OTHER PARTICULARS IN RESPECT OF ENVIRONMENTAL PROTECTION AND ABATEMENT OF POLLUTION.**

- a) PME is done for each worker at an interval of five years under occupational health surveillance program.
- b) The Environmental Monitoring is carried out fortnightly for the project by CMPDI, RI-I as per the guide lines of Ministry of Environment and Forest & Climate Change (MoEF&CC) and based on the result thereof, project takes necessary action if needed.

**Annexure-I****Air Quality Monitoring Report**

Station No.	Station Name	Month	Fortnight	Date of Sampling	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>
16A1	Mine Dispatch Building	May	First	11-May-20	186.7	52.3	<10.0	19.7
16A1	Mine Dispatch Building	May	Second	28-May-20	238	66.6	<10.0	18.7
16A1	Mine Dispatch Building	June	First	10-Jun-20	178.6	50	<10.0	17.6
16A1	Mine Dispatch Building	June	Second	25-Jun-20	154.3	50.4	<10.0	16.8
16A1	Mine Dispatch Building	July	First	14-Jul-20	156.4	43.8	<10.0	15.8
16A1	Mine Dispatch Building	July	Second	28-Jul-20	154.3	132.8	<10.0	14.5
16A1	Mine Dispatch Building	August	First	04-Aug-20	122.8	40.6	<10.0	19.4
16A1	Mine Dispatch Building	August	Second	18-Aug-20	139.6	38.5	<10.0	16.5
16A1	Mine Dispatch Building	September	First	09-Sep-20	104.3	35.1	<10.0	16.8
16A1	Mine Dispatch Building	September	Second	21-Sep-20	142.3	40.6	<10.0	16.7
16A1	Mine Dispatch Building	October	First	12-Oct-20	168.3	37.5	<10.0	19.8
16A1	Mine Dispatch Building	October	Second	19-Oct-20	149.4	45.8	<10.0	17.3
16A1	Mine Dispatch Building	November	First	09-Nov-20	165.8	50.2	<10.0	18.6
16A1	Mine Dispatch Building	November	Second	24-Nov-20	216.4	47.1	<10.0	18.4
16A1	Mine Dispatch Building	December	First	01-Dec-20	168.2	52.4	<10.0	18.7
16A1	Mine Dispatch Building	December	Second	29-Dec-20	168.4	37.5	<10.0	17.7
16A1	Mine Dispatch Building	January	First	07-Jan-21	189.4	56.3	<10.0	19.4
16A1	Mine Dispatch Building	January	Second	19-Jan-21	274.6	51.7	<10.0	13.7
16A1	Mine Dispatch Building	February	First	08-Feb-21	238.6	46.2	<10.0	18.6
16A1	Mine Dispatch Building	February	Second	25-Feb-21	195.6	50.5	<10.0	19.7
16A1	Mine Dispatch Building	March	First	11-Mar-21	212.6	55.8	<10.0	19.2
16A1	Mine Dispatch Building	March	Second	22-Mar-21	215.8	46.4	<10.0	19.6
16A2	CISF Camp	May	First	11-May-20	174.4	48.8	<10.0	17.5
16A2	CISF Camp	May	Second	28-May-20	196.7	55.1	<10.0	19.8
16A2	CISF Camp	June	First	10-Jun-20	158.4	44.4	<10.0	16.9
16A2	CISF Camp	June	Second	25-Jun-20	139.6	49	<10.0	16.2
16A2	CISF Camp	July	First	14-Jul-20	135.8	38	<10.0	16.8
16A2	CISF Camp	July	Second	28-Jul-20	139.6	108.5	<10.0	14.7
16A2	CISF Camp	August	First	04-Aug-20	94.7	32.2	<10.0	17.2
16A2	CISF Camp	August	Second	18-Aug-20	112.9	34.1	<10.0	16
16A2	CISF Camp	September	First	09-Sep-20	93.4	31.8	<10.0	15.2
16A2	CISF Camp	September	Second	22-Sep-20	114.7	35.4	<10.0	16.2
16A2	CISF Camp	October	First	12-Oct-20	91.4	31.2	<10.0	16.2
16A2	CISF Camp	October	Second	20-Oct-20	124.8	38.9	<10.0	16.4
16A2	CISF Camp	November	First	10-Nov-20	138.2	43.7	<10.0	16.8
16A2	CISF Camp	November	Second	24-Nov-20	168.7	46	<10.0	16.3
16A2	CISF Camp	December	First	02-Dec-20	142.6	45.3	<10.0	17.2
16A2	CISF Camp	December	Second	29-Dec-20	278.3	59.5	<10.0	19.2
16A2	CISF Camp	January	First	07-Jan-21	161.3	49.8	<10.0	18.1
16A2	CISF Camp	January	Second	19-Jan-21	136.8	40.3	<10.0	12.7
16A2	CISF Camp	February	First	08-Feb-21	184.7	38.1	<10.0	17.3
16A2	CISF Camp	February	Second	26-Feb-21	174.8	47.3	<10.0	18.8
16A2	CISF Camp	March	First	12-Mar-21	186.4	48.2	<10.0	18.4
16A2	CISF Camp	March	Second	23-Mar-21	188.7	49.3	<10.0	18.5
16A3	Urjanagar Hospital	May	First	12-May-20	97.8	35.2	<10.0	14.6
16A3	Urjanagar Hospital	May	Second	29-May-20	95.7	34.5	<10.0	15.6
16A3	Urjanagar Hospital	June	First	11-Jun-20	91.4	32.9	<10.0	15.2
16A3	Urjanagar Hospital	June	Second	26-Jun-20	91.5	38.4	<10.0	14.9
16A3	Urjanagar Hospital	July	First	15-Jul-20	89.4	32.2	<10.0	13.7
16A3	Urjanagar Hospital	July	Second	29-Jul-20	91.5	84.3	<10.0	12.6
16A3	Urjanagar Hospital	August	First	04-Aug-20	86.6	28.9	<10.0	12.8
16A3	Urjanagar Hospital	August	Second	19-Aug-20	89.5	30.2	<10.0	14.2
16A3	Urjanagar Hospital	September	First	10-Sep-20	74.6	26.2	<10.0	12.5

Station No.	Station Name	Month	Fortnight	Date of Sampling	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>
16A3	Urjanagar Hospital	September	Second	21-Sep-20	90.4	30.8	<10.0	14.6
16A3	Urjanagar Hospital	October	First	12-Oct-20	81.7	28.3	<10.0	14.7
16A3	Urjanagar Hospital	October	Second	19-Oct-20	93.2	32.4	<10.0	14.8
16A3	Urjanagar Hospital	November	First	09-Nov-20	95.4	34.8	<10.0	15.1
16A3	Urjanagar Hospital	November	Second	25-Nov-20	96.4	32.7	<10.0	17.2
16A3	Urjanagar Hospital	December	First	01-Dec-20	96.2	35.2	<10.0	15.4
16A3	Urjanagar Hospital	December	Second	30-Dec-20	116.8	38.8	<10.0	13.8
16A3	Urjanagar Hospital	January	First	08-Jan-21	98.2	37.1	<10.0	15.8
16A3	Urjanagar Hospital	January	Second	18-Jan-21	87.3	31.2	<10.0	14.6
16A3	Urjanagar Hospital	February	First	09-Feb-21	88.2	32.6	<10.0	12.8
16A3	Urjanagar Hospital	February	Second	25-Feb-21	98.9	35.7	<10.0	16
16A3	Urjanagar Hospital	March	First	11-Mar-21	99	36.1	<10.0	16.2
16A3	Urjanagar Hospital	March	Second	22-Mar-21	98.2	36	<10.0	16.1
16A4	GM office of Rajmahal Area	May	First	12-May-20	93.6	31.8	<10.0	13.8
16A4	GM office of Rajmahal Area	June	First	11-Jun-20	89.7	30.5	<10.0	14.7
16A4	GM office of Rajmahal Area	June	Second	26-Jun-20	94.6	40.2	<10.0	15.3
16A4	GM office of Rajmahal Area	July	First	15-Jul-20	86.4	29.4	<10.0	12.3
16A4	GM office of Rajmahal Area	July	Second	29-Jul-20	94.6	88.7	<10.0	13.7
16A4	GM office of Rajmahal Area	August	First	04-Aug-20	78.9	27.5	<10.0	14.1
16A4	GM office of Rajmahal Area	August	Second	19-Aug-20	92.5	33.6	<10.0	14.9
16A4	GM office of Rajmahal Area	September	First	10-Sep-20	87.2	30	<10.0	14.2
16A4	GM office of Rajmahal Area	September	Second	22-Sep-20	94.8	34.6	<10.0	14.8
16A4	GM office of Rajmahal Area	October	First	12-Oct-20	83.8	28.9	<10.0	13.8
16A4	GM office of Rajmahal Area	October	Second	20-Oct-20	96.6	35.8	<10.0	15.1
16A4	GM office of Rajmahal Area	November	First	10-Nov-20	98.5	37.2	<10.0	15.4
16A4	GM office of Rajmahal Area	November	Second	25-Nov-20	83.2	28.8	<10.0	18.8
16A4	GM office of Rajmahal Area	December	First	02-Dec-20	99	37.6	<10.0	15.9
16A4	GM office of Rajmahal Area	December	Second	30-Dec-20	138.6	45.4	<10.0	14.6
16A4	GM office of Rajmahal Area	January	First	08-Jan-21	99.3	37.8	<10.0	16.3
16A4	GM office of Rajmahal Area	January	Second	18-Jan-21	134.9	36.9	<10.0	13.8
16A4	GM office of Rajmahal Area	February	First	09-Feb-21	93.4	33.8	<10.0	13.6
16A4	GM office of Rajmahal Area	February	Second	26-Feb-21	99.7	36.8	<10.0	16.5
16A4	GM office of Rajmahal Area	March	First	12-Mar-21	99.8	37.9	<10.0	17
16A4	GM office of Rajmahal Area	March	Second	23-Mar-21	99.7	37.7	<10.0	16.8

#### Analysis of Heavy Metals in Air

Station No.	Station Name	Date of Sampling	Arsenic (ng/m <sup>3</sup> )	Cadmium (µg/m <sup>3</sup> )	Chromium (µg/m <sup>3</sup> )	Mercury (µg/m <sup>3</sup> )	Nickel (ng/m <sup>3</sup> )	Lead (µg/m <sup>3</sup> )
<b>Method of Detection</b>			<b>Atomic Absorption Spectrophotometric (AAS)</b>					
<b>Detection Limit</b>			<b>1.0</b>	<b>0.001</b>	<b>0.01</b>	<b>0.001</b>	<b>0.10</b>	<b>0.005</b>
16A1	Mine Dispatch Building	9-Sep-20	BDL	BDL	BDL	BDL	BDL	BDL
16A2	CISF Camp	9-Sep-20	BDL	BDL	BDL	BDL	BDL	BDL
16A3	Urjanagar Hospital	10-Sep-20	BDL	BDL	BDL	BDL	BDL	BDL
16A4	Rajmahal Area Office	10-Sep-20	BDL	BDL	BDL	BDL	BDL	BDL
16A1	Mine Dispatch Building	11-Mar-21	BDL	BDL	BDL	BDL	BDL	BDL
16A2	CISF Camp	12-Mar-21	BDL	BDL	BDL	BDL	BDL	BDL
16A3	Urjanagar Hospital	11-Mar-21	BDL	BDL	BDL	BDL	BDL	BDL
16A4	Rajmahal Area Office	12-Mar-21	BDL	BDL	BDL	BDL	BDL	BDL

#### Environmental standards:

National Ambient Air Quality Standards (NAAQS), 2009 for residential, industrial and rural areas for 24 hourly/yearly samples:

Heavy Metal	Arsenic (As) (ng/m <sup>3</sup> )	Cadmium (Cd) (µg/m <sup>3</sup> )	Chromium (Cr) (µg/m <sup>3</sup> )	Mercury (Hg) (µg/m <sup>3</sup> )	Nickel (Ni) (ng/m <sup>3</sup> )	Lead (Pb) (µg/m <sup>3</sup> )
<b>Concentration</b>	6	Not specified	Not specified	Not specified	20	0.5

**Annexure-II****NOISE LEVEL**

Station No.	Station Name	Month	Fortnight	Date of Sampling	Noise Level dB(A)
16N1	Mine Dispatch Building	May	First	28-May-20	63.4
16N1	Mine Dispatch Building	September	First	09-Sep-20	63.8
16N1	Mine Dispatch Building	November	First	24-Nov-20	59.6
16N1	Mine Dispatch Building	December	First	23-Dec-20	54.7
16N1	Mine Dispatch Building	January	First	06-Jan-21	62.41
16N1	Mine Dispatch Building	January	Second	18-Jan-21	57.34
16N1	Mine Dispatch Building	February	First	08-Feb-21	61.45
16N1	Mine Dispatch Building	February	Second	25-Feb-21	56.93
16N1	Mine Dispatch Building	March	First	11-Mar-21	78.88
16N1	Mine Dispatch Building	Second	First	23-Mar-21	79.01
16N2	CISF Camp	May	First	28-May-20	62.6
16N2	CISF Camp	September	First	09-Sep-20	48.2
16N2	CISF Camp	November	First	24-Nov-20	50.7
16N2	CISF Camp	December	First	23-Dec-20	56.9
16N2	CISF Camp	January	First	06-Jan-21	73.08
16N2	CISF Camp	January	Second	18-Jan-21	61.33
16N2	CISF Camp	February	First	08-Feb-21	63.59
16N2	CISF Camp	February	Second	25-Feb-21	66.5
16N2	CISF Camp	March	First	12-Mar-21	68.79
16N2	CISF Camp	Second	First	22-Mar-21	74.82
16N3	Urjanagar Hospital	May	First	28-May-20	54.6
16N3	Urjanagar Hospital	September	First	09-Sep-20	46.2
16N3	Urjanagar Hospital	November	First	24-Nov-20	47.5
16N3	Urjanagar Hospital	December	First	24-Dec-20	50.6
16N3	Urjanagar Hospital	January	First	07-Jan-21	86.83
16N3	Urjanagar Hospital	January	Second	19-Jan-21	60.15
16N3	Urjanagar Hospital	February	First	09-Feb-21	83.75
16N3	Urjanagar Hospital	February	Second	26-Feb-21	64.54
16N3	Urjanagar Hospital	March	First	11-Mar-21	64.15
16N3	Urjanagar Hospital	Second	First	22-Mar-21	62.37
16N4	ECL Rest House at Pirpainthee Market	May	First	28-May-20	51.4
16N4	ECL Rest House at Pirpainthee Market	September	First	09-Sep-20	53.6
16N4	ECL Rest House at Pirpainthee Market	November	First	24-Nov-20	52.1
16N4	ECL Rest House at Pirpainthee Market	December	First	24-Dec-20	58.4
16N4	ECL Rest House at Pirpainthee Market	January	First	07-Jan-21	69.83
16N4	ECL Rest House at Pirpainthee Market	January	Second	19-Jan-21	58.63
16N4	ECL Rest House at Pirpainthee Market	February	First	09-Feb-21	83.87
16N4	ECL Rest House at Pirpainthee Market	February	Second	26-Feb-21	57.63
16N4	ECL Rest House at Pirpainthee Market	March	First	12-Mar-21	74.63
16N4	ECL Rest House at Pirpainthee Market	Second	First	23-Mar-21	78.24

**Annexure-III****EFFLUENT WATER QUALITY (5 PARAMETERS)**

Station No.	Station Name	Month	Fortnight	Date of Sampling	pH	TSS	TDS	O&G	COD
16MW1	OCP discharge water	May	First	12-May-20	8.03	24	322	<2.0	24
16MW1	OCP discharge water	May	Second	29-May-20	8.03	20	388	<2.0	20
16MW1	OCP discharge water	June	First	11-Jun-20	7.94	22	328	<2.0	16
16MW1	OCP discharge water	June	Second	26-Jun-20	8.01	24	392	<2.0	24
16MW1	OCP discharge water	July	First	15-Jul-20	7.94	22	328	<2.0	16
16MW1	OCP discharge water	July	Second	29-Jul-20	8.01	24	392	<2.0	24
16MW1	OCP discharge water	August	First	04-Aug-20	7.91	26	376	<2.0	24
16MW1	OCP discharge water	August	Second	18-Aug-20	7.94	26	376	<2.0	24
16MW1	OCP discharge water	September	Second	22-Sep-20	7.83	22.9	364	<2.0	20
16MW1	OCP discharge water	October	First	12-Oct-20	7.93	28.0	338	<2.0	20
16MW1	OCP discharge water	October	First	12-Oct-20	7.93	28.0	338	<2.0	20
16MW1	OCP discharge water	October	Second	20-Oct-20	7.83	30	346	<2.0	24
16MW1	OCP discharge water	October	Second	20-Oct-20	7.83	30	346	<2.0	24
16MW1	OCP discharge water	November	First	09-Nov-20	7.84	26.0	372	<2.0	24
16MW1	OCP discharge water	November	Second	24-Nov-20	7.75	24.2	346	<2.0	24
16MW1	OCP discharge water	December	First	02-Dec-20	7.86	20.0	368	<2.0	28
16MW1	OCP discharge water	December	Second	23-Dec-20	6.54	18.2	382	<2.0	32
16MW1	OCP discharge water	January	First	07-Jan-21	7.89	17.2	343	<2.0	20
16MW1	OCP discharge water	January	Second	19-Jan-21	7.66	16.0	353	<2.0	12
16MW1	OCP discharge water	February	First	09-Feb-21	7.17	16.8	375	<2.0	28
16MW1	OCP discharge water	February	Second	26-Feb-21	7.52	16.0	361	<2.0	32
16MW1	OCP discharge water	March	First	12-Mar-21	16.2	16.2	358	<2.0	40
16MW2	Discharge from CHP	May	First	12-May-20	8.07	24	448	<2.0	20
16MW2	Discharge from CHP	May	Second	29-May-20	8.07	28	476	<2.0	24
16MW2	Discharge from CHP	June	First	11-Jun-20	7.87	34	410	<2.0	20
16MW2	Discharge from CHP	June	Second	26-Jun-20	8.04	34	476	<2.0	16
16MW2	Discharge from CHP	July	First	15-Jul-20	7.87	34	410	<2.0	20
16MW2	Discharge from CHP	July	Second	29-Jul-20	8.04	34	476	<2.0	16
16MW2	Discharge from CHP	August	First	04-Aug-20	7.65	30	480	<2.0	28
16MW2	Discharge from CHP	August	Second	18-Aug-20	7.72	32	444	<2.0	28
16MW2	Discharge from CHP	September	Second	22-Sep-20	7.64	30.0	476	<2.0	24
16MW2	Discharge from CHP	October	First	12-Oct-20	7.51	28.1	486	<2.0	24
16MW2	Discharge from CHP	October	First	12-Oct-20	7.51	28.1	486	<2.0	24
16MW2	Discharge from CHP	October	Second	20-Oct-20	7.64	31	494	<2.0	16
16MW2	Discharge from CHP	October	Second	20-Oct-20	7.64	31	494	<2.0	16
16MW2	Discharge from CHP	November	First	09-Nov-20	7.42	27.2	454	<2.0	28
16MW2	Discharge from CHP	November	Second	24-Nov-20	7.52	26.8	494	<2.0	16
16MW2	Discharge from CHP	December	First	02-Dec-20	7.71	19.8	482	<2.0	32
16MW2	Discharge from CHP	December	Second	23-Dec-20	7.29	19.4	454	<2.0	32
16MW2	Discharge from CHP	January	First	07-Jan-21	7.28	20.4	458	<2.0	28
16MW2	Discharge from CHP	January	Second	19-Jan-21	7.36	19.2	426	<2.0	32
16MW2	Discharge from CHP	February	First	09-Feb-21	7.14	19.4	446	<2.0	24
16MW2	Discharge from CHP	February	Second	26-Feb-21	7.28	20.6	458	<2.0	36
16MW2	Discharge from CHP	March	First	12-Mar-21	20.0	20.0	472	<2.0	36
16MW3	100 m up-stream of Dhulia Nallah	May	First	12-May-20	7.51	20	394	<2.0	32
16MW3	100 m up-stream of Dhulia Nallah	May	Second	29-May-20	7.42	18	314	<2.0	20
16MW3	100 m up-stream of Dhulia Nallah	June	First	11-Jun-20	7.62	22	386	<2.0	28
16MW3	100 m up-stream of Dhulia Nallah	June	Second	26-Jun-20	7.57	24	348	<2.0	20
16MW3	100 m up-stream of Dhulia Nallah	July	First	15-Jul-20	7.62	22	386	<2.0	28
16MW3	100 m up-stream of Dhulia Nallah	July	Second	29-Jul-20	7.57	24	348	<2.0	20
16MW3	100 m up-stream of Dhulia Nallah	August	First	05-Aug-20	7.18	26	320	<2.0	32
16MW3	100 m up-stream of Dhulia Nallah	August	Second	18-Aug-20	7.24	26	370	<2.0	32
16MW3	100 m up-stream of Dhulia Nallah	September	Second	22-Sep-20	7.31	28.0	320	<2.0	16
16MW3	100 m up-stream of Dhulia Nallah	October	First	12-Oct-20	7.26	30.2	370	<2.0	16

Station No.	Station Name	Month	Fortnight	Date of Sampling	pH	TSS	TDS	O&G	COD
16MW3	100 m up-stream of Dhulia Nallah	October	First	12-Oct-20	7.26	30.2	370	<2.0	16
16MW3	100 m up-stream of Dhulia Nallah	October	Second	20-Oct-20	7.32	29	356	<2.0	20
16MW3	100 m up-stream of Dhulia Nallah	October	Second	20-Oct-20	7.32	29	356	<2.0	20
16MW3	100 m up-stream of Dhulia Nallah	November	First	10-Nov-20	7.18	28.0	344	<2.0	32
16MW3	100 m up-stream of Dhulia Nallah	November	Second	24-Nov-20	7.47	26.4	356	<2.0	20
16MW3	100 m up-stream of Dhulia Nallah	December	First	02-Dec-20	7.62	22.7	328	<2.0	28
16MW3	100 m up-stream of Dhulia Nallah	December	Second	23-Dec-20	7.80	20.2	362	<2.0	40
16MW3	100 m up-stream of Dhulia Nallah	January	First	07-Jan-21	7.52	19.2	351	<2.0	32
16MW3	100 m up-stream of Dhulia Nallah	January	Second	19-Jan-21	7.53	20.2	357	<2.0	24
16MW3	100 m up-stream of Dhulia Nallah	February	First	09-Feb-21	7.02	17.9	368	<2.0	32
16MW3	100 m up-stream of Dhulia Nallah	February	Second	26-Feb-21	7.41	18.0	350	<2.0	40
16MW3	100 m up-stream of Dhulia Nallah	March	First	12-Mar-21	18.0	18.0	364	<2.0	28
16MW4	100 m down-stream of Dhulia Nallah	May	First	12-May-20	7.63	26	478	<2.0	28
16MW4	100 m down-stream of Dhulia Nallah	May	Second	29-May-20	7.38	20	434	<2.0	16
16MW4	100 m down-stream of Dhulia Nallah	June	First	11-Jun-20	7.54	24	458	<2.0	32
16MW4	100 m down-stream of Dhulia Nallah	June	Second	26-Jun-20	7.41	24	496	<2.0	24
16MW4	100 m down-stream of Dhulia Nallah	July	First	15-Jul-20	7.54	24	458	<2.0	32
16MW4	100 m down-stream of Dhulia Nallah	July	Second	29-Jul-20	7.41	24	496	<2.0	24
16MW4	100 m down-stream of Dhulia Nallah	August	First	05-Aug-20	7.53	28	412	<2.0	20
16MW4	100 m down-stream of Dhulia Nallah	August	Second	19-Aug-20	7.46	28	484	<2.0	20
16MW4	100 m down-stream of Dhulia Nallah	September	Second	22-Sep-20	7.36	25.6	414	<2.0	20
16MW4	100 m down-stream of Dhulia Nallah	October	First	12-Oct-20	7.59	24.0	454	<2.0	20
16MW4	100 m down-stream of Dhulia Nallah	October	First	12-Oct-20	7.59	24	454	<2.0	20
16MW4	100 m down-stream of Dhulia Nallah	October	Second	20-Oct-20	7.46	25	472	<2.0	24
16MW4	100 m down-stream of Dhulia Nallah	October	Second	20-Oct-20	7.46	25	472	<2.0	24
16MW4	100 m down-stream of Dhulia Nallah	November	First	10-Nov-20	7.44	18.9	408	<2.0	36
16MW4	100 m down-stream of Dhulia Nallah	November	Second	25-Nov-20	7.33	18.0	472	<2.0	24
16MW4	100 m down-stream of Dhulia Nallah	December	First	02-Dec-20	7.70	17.1	420	<2.0	32
16MW4	100 m down-stream of Dhulia Nallah	January	First	07-Jan-21	7.81	15.4	420	<2.0	24
16MW4	100 m down-stream of Dhulia Nallah	January	Second	19-Jan-21	7.65	18.2	418	<2.0	28
16MW4	100 m down-stream of Dhulia Nallah	February	First	09-Feb-21	7.14	14.6	481	<2.0	40
16MW4	100 m down-stream of Dhulia Nallah	February	Second	26-Feb-21	7.52	15.6	474	<2.0	44
16MW4	100 m down-stream of Dhulia Nallah	March	First	12-Mar-21	16.2	16.2	442	<2.0	32
16MW5	Discharge from O & T at workshop	May	First	12-May-20	8.02	20	464	<2.0	32
16MW5	Discharge from O & T at workshop	May	Second	29-May-20	8.03	22	456	<2.0	28
16MW5	Discharge from O & T at workshop	June	First	11-Jun-20	7.92	28	472	<2.0	20

Station No.	Station Name	Month	Fortnight	Date of Sampling	pH	TSS	TDS	O&G	COD
16MW5	Discharge from O & T at workshop	June	Second	26-Jun-20	8.07	28	466	<2.0	20
16MW5	Discharge from O & T at workshop	June	Second	26-Jun-20	8.07	28	466	<2.0	20
16MW5	Discharge from O & T at workshop	July	First	15-Jul-20	7.92	28	472	<2.0	20
16MW5	Discharge from O & T at workshop	July	Second	29-Jul-20	8.07	28	466	<2.0	20
16MW5	Discharge from O & T at workshop	August	First	04-Aug-20	7.91	32	436	<2.0	24
16MW5	Discharge from O & T at workshop	August	Second	19-Aug-20	7.88	26	432	<2.0	24
16MW5	Discharge from O & T at workshop	September	Second	22-Sep-20	7.78	26.9	428	<2.0	24
16MW5	Discharge from O & T at workshop	October	Second	22-Sep-20	7.78	26.9	428	<2.0	24
16MW5	Discharge from O & T at workshop	October	First	12-Oct-20	8.01	24.3	442	<2.0	24
16MW5	Discharge from O & T at workshop	October	First	12-Oct-20	8.01	24.3	442	<2.0	24
16MW5	Discharge from O & T at workshop	October	Second	20-Oct-20	8.03	26	446	<2.0	20
16MW5	Discharge from O & T at workshop	October	Second	20-Oct-20	8.03	26	446	<2.0	20
16MW5	Discharge from O & T at workshop	November	First	10-Nov-20	7.92	20.4	442	<2.0	40
16MW5	Discharge from O & T at workshop	November	Second	25-Nov-20	8.01	20.2	440	<2.0	20
16MW5	Discharge from O & T at workshop	December	First	02-Dec-20	6.95	17.9	432	<2.0	44
16MW5	Discharge from O & T at workshop	January	First	07-Jan-21	7.01	15.2	471	<2.0	16
16MW5	Discharge from O & T at workshop	January	Second	19-Jan-21	7.40	13.8	422	<2.0	16
16MW5	Discharge from O & T at workshop	February	First	09-Feb-21	7.11	18.0	450	<2.0	44
16MW5	Discharge from O & T at workshop	February	Second	26-Feb-21	7.31	18.4	468	<2.0	36
16MW5	Discharge from O & T at workshop	March	First	12-Mar-21	7.24	20.4	432	<2.0	36

**Note:** All parameters are in mg/l unless specified otherwise

**Effluent Water Quality Standards (MoEF Schedule – VI Standards)**

Parameters	pH	TSS	TDS	Oil & Grease	COD
Limit	5.5-9.0	100	Not Specified	10	250

**EFFLUENT QUALITY STANDARDS (29 PARAMETERS)**

Cluster	Rajmahal OCP	Rajmahal OCP	Rajmahal OCP	Rajmahal OCP	Rajmahal OCP	Rajmahal OCP	Rajmahal OCP	Rajmahal OCP	Rajmahal OCP	Rajmahal OCP
Station No.	16MW1	16MW2	16MW3	16MW4	16MW5	16MW5	16MW1	16MW2	16MW3	16MW4
Station Name	OCP discharge water	Discharge from CHP	100 m upstream of Dhulia Nallah	100 m downstream of Dhulia Nallah	Discharge from O & G at workshop	Discharge from O & G at workshop	OCP discharge water	Discharge from CHP	100 m upstream of Dhulia Nallah	100 m downstream of Dhulia Nallah
Month	September	September	September	September	September	March	March	March	March	March
Fortnight	First	First	First	First	First	First	First	First	First	First
Date of Sampling	09-Sep-20	09-Sep-20	10-Sep-20	10-Sep-20	10-Sep-20	23-Mar-21	23-Mar-21	23-Mar-21	23-Mar-21	23-Mar-21
Colour	4	4	4	3	4	3	4	3	3	4
Odour	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable	Unobjectionable
TSS	24.0	28.0	26.2	27.2	24.2	24.6	17.2	19.4	20.1	16.2
pH	8.02	7.51	7.23	7.61	7.83	7.04	7.68	7.05	7.02	6.99
Temperature(Deg C)	29.3	29.2	29.3	29.2	29.2	27.3	27.3	27.3	27.3	27.3
Oil & Grease	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total Residual Chlorine	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Ammonical Nitrogen	0.82	0.49	0.72	0.89	0.89	0.59	0.84	0.92	0.89	0.78
Total Kjeldahi Nitrogen	1.84	1.46	1.72	1.45	1.79	1.89	1.84	1.82	1.92	1.72
Free Amonia	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
BOD	12	14	8	12	10	7	16	13	11	11
COD	20	20	16	24	20	40	44	32	24	36
Arsenic	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Hexavalent Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Chromium	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Copper	0.03	<0.03	0.03	0.03	0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Zinc	0.03	0.03	0.03	0.02	0.03	<0.01	<0.01	<0.01	<0.01	<0.01

Selenium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoride	0.36	0.40	0.34	0.42	0.36	0.28	0.36	0.32	0.28	0.40
Dissolved Phosphate	1.66	1.46	1.30	1.36	1.32	1.38	1.76	1.52	1.37	1.47
Sulphide	0.006	0.006	0.006	0.009	0.009	0.011	0.009	0.008	0.009	0.012
Phenolics	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	0.20	0.17	0.16	0.20	0.16	<0.02	<0.02	<0.02	<0.02	<0.02
Iron	0.10	0.09	0.08	0.09	0.09	<0.06	<0.06	<0.06	<0.06	<0.06
Nitrate Nitrogen	2.8	3.2	3.4	3.2	2.6	4.4	3.6	3.6	3.0	3.2
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Dissolved Solids	362	422	320	482	428	464	380	452	391	452

**Note:** All parameters in mg/l unless otherwise specified

**DRINKING/GROUNDWATER QUALITY REPORT**

Sl. No.	Parameters	Analytical Results		Indian Standard Drinking Water (IS-10500 :2012)		Method of detection	Detection Limit
	Sample code	16GW2	16GW3	Acceptable Limit	Permissible Limit		
	Sampling Date	28-May-20	28-May-20				
1	Colour, Hazen	3	2	5.0	15.0	Platinum Cobalt	1.0 Hazen
2	Odour	Unobjectionable	Unobjectionable	Unobjectionable		Physical	-
3	Taste	Agreeable	Agreeable	Agreeable		Physical	-
4	Turbidity, NTU	3	2	1	5	Nephelometric	1.0 NTU
5	pH value	7.36	7.28	6.5-8.5	No relaxation	Electrometric	0.01
6	Total Hardness	252	260	300	600	EDTA	4.0
7	Iron	BDL	BDL	0.3	No relaxation	AAS Flame	0.06
8	Chlorides	128	109	250	1000	Argentometric	2.0
9	Res Free Chlorine	0.04	0.02	0.2	1	Spectrophotometric	0.02
10	Dissolved Solids	762	823	500	2000	Gravimetric	10.0
11	Calcium	79	81	75	200	EDTA	1.60
12	Copper	BDL	BDL	0.05	1.5	AAS Flame	0.03
13	Manganese	BDL	BDL	0.1	0.3	AAS Flame	0.02
14	Sulphate	82	78	200	400	Turbidity	2.0
15	Nitrate	9.26	10.48	45	No relaxation	Spectrophotometric	0.5
16	Fluoride	0.48	0.36	1	1.5	SPANDS	0.02
17	Selenium	BDL	BDL	0.01	No relaxation	AAS - GTA	0.002
18	Arsenic	BDL	BDL	0.01	0.05	AAS - VGA	0.002
19	Lead	BDL	BDL	0.01	No relaxation	AAS - GTA	0.005
20	Zinc	0.03	0.02	5	15	AAS Flame	0.01
21	Hex Chromium	BDL	BDL	0.05	0.05	Colorimetric	0.01
22	Boron	BDL	BDL	0.5	1	Colorimetric Carmine	0.20
23	Coliforms (MPN)	NIL	NIL	Not Specified		Chloroform Extraction	1.0
24	Phenolics	BDL	BDL	0.001	0.002	Titrimetric Indicator	0.001
25	Alkalinity	232	200	200	600	Titrimetric	4.0
26	Cadmium	BDL	BDL	0.003	No relaxation	AAS - GTA	0.0005

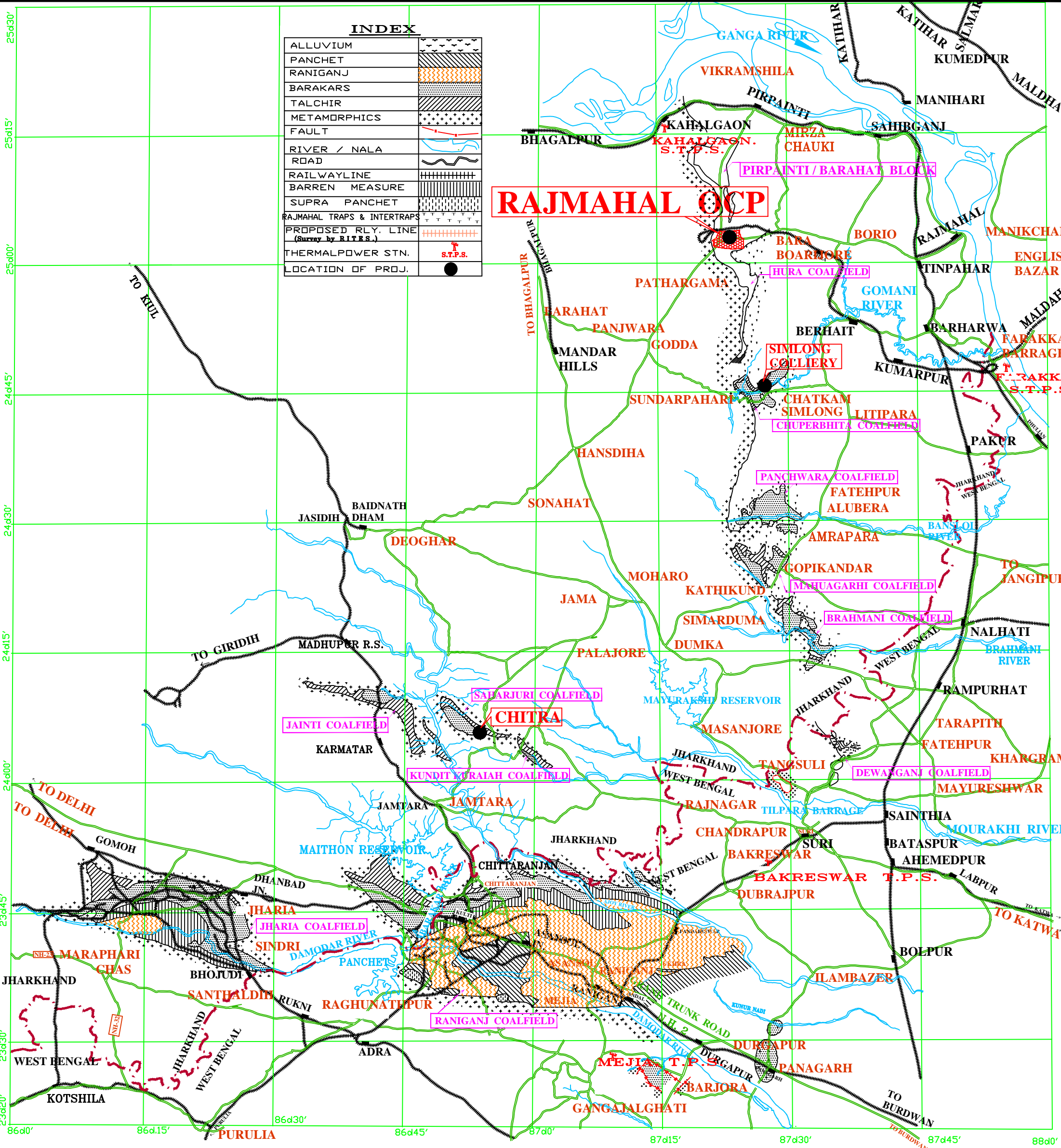
**NOTE:** All parameters are in mg/l unless specified otherwise.

**Annexure-IV****Groundwater Level**

Station No.	Station Name	Month	Fortnight	Date of Sampling	Ground Water Level BGL (mtr)
16GWL1	Dugwell at Bara Simra Rehab Site	November	First	09-Nov-20	Dry
16GWL1	Dugwell at Bara Simra Rehab Site	December	First	24-Dec-20	Dry
16GWL1	Dugwell at Bara Simra Rehab Site	January	First	28-Jan-21	8.05
16GWL2	Dugwell at Higukita Village	May	First	28-May-20	6.10
16GWL2	Dugwell at Higukita Village	November	First	09-Nov-20	5.10
16GWL2	Dugwell at Higukita Village	December	First	24-Dec-20	5.30
16GWL2	Dugwell at Higukita Village	January	First	28-Jan-21	5.90
16GWL3	Dugwell at Lalmatia Chowk	May	First	28-May-20	7.50
16GWL3	Dugwell at Lalmatia Chowk	November	First	09-Nov-20	5.20
16GWL3	Dugwell at Lalmatia Chowk	December	First	24-Dec-20	5.40
16GWL3	Dugwell at Lalmatia Chowk	January	First	28-Jan-21	6.80
16GWL4	Dugwell at Lohandia Bazar	May	First	28-May-20	-
16GWL4	Dugwell at Lohandia Bazar	November	First	09-Nov-20	7.15
16GWL4	Dugwell at Lohandia Bazar	December	First	24-Dec-20	7.30
16GWL4	Dugwell at Lohandia Bazar	January	First	28-Jan-21	10.30

**Piezometer water level**

Sl. No.	Station Code	Location of Dugwell	Date of measurement	Water level (in Meters) Below Ground Level
1	RPZ-01	Rajmahal (Rajmahal Old workshop)	28-May-20	10.70
1	RPZ-01	Rajmahal (Rajmahal Old workshop)	18-Aug-20	9.53
1	RPZ-01	Rajmahal(Rajmahal Old workshop)	9-Nov-20	Closed
1	RPZ-01	Rajmahal (Rajmahal Old workshop)		Closed



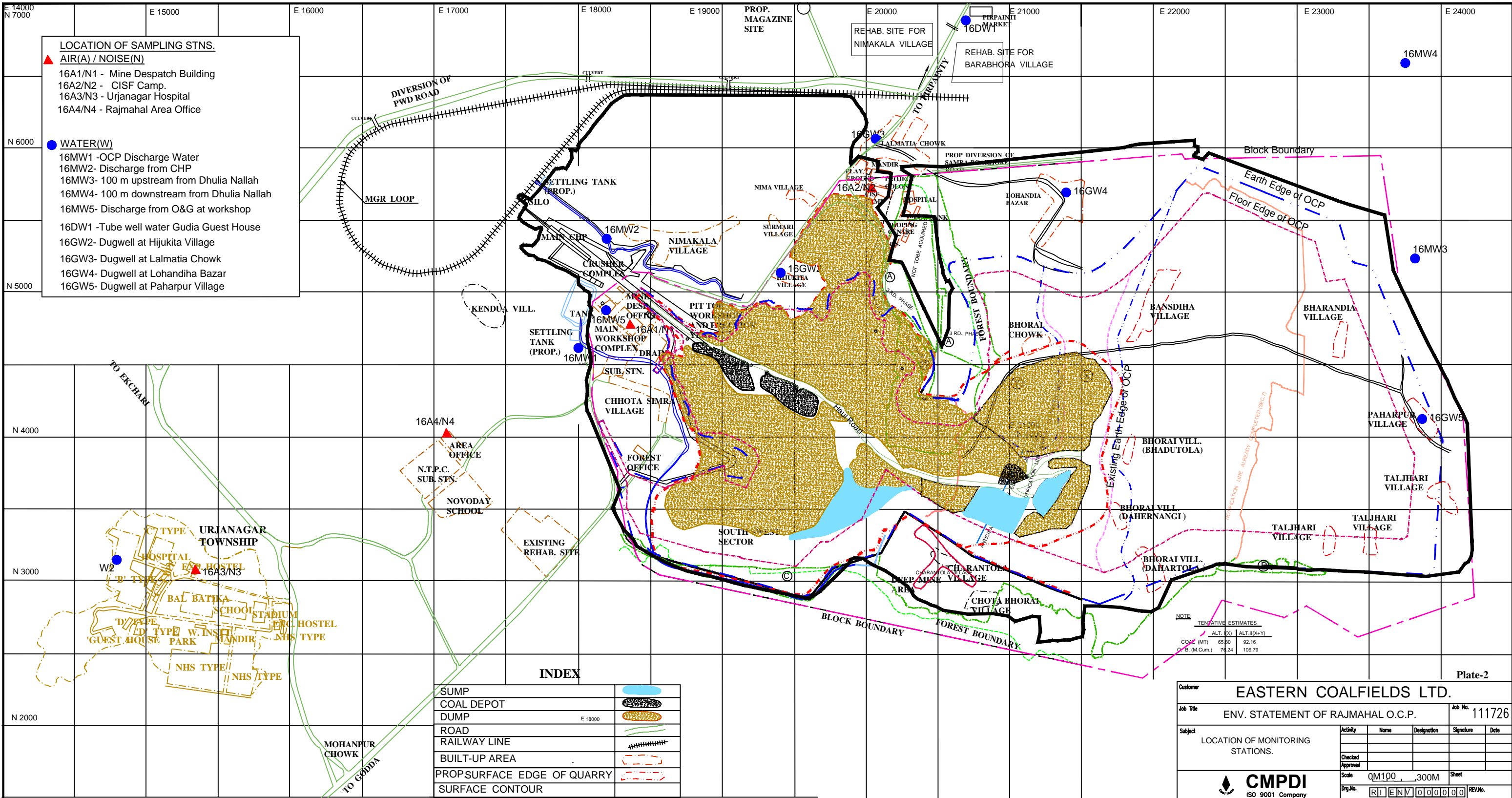
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BARREN MEASURE	
SUPRA PANCHET	
RAJMAHAL TRAPS & INTERTRAPS	
PROPOSED RLY. LINE (Survey by RITES.)	
THERMALPOWER STN.	
LOCATION OF PROJ.	

# RAJMAHAL OCP

**PLATE-1**

<b>EASTERN COALFIELDS LTD.</b>			
<b>ENV. STATEMENT</b>			
Job No.	111726		
<b>LOCATION MAP</b>		Activity	Name
<b>RAJMAHAL OCP</b>		Designation	Signature
Checked		Date	
Approved			
		Scale	NTS
RI-1/ENV/390		Sheet	



Customer		<b>EASTERN COALFIELDS LTD.</b>			
Job Title		ENV. STATEMENT OF RAJMAHAL O.C.P.		Job No. 111726	
Subject		LOCATION OF MONITORING STATIONS.		Checked	
				Approved	
		Scale QM100 : 300M		Sheet	
		Cmpdi Logo		REV.No.	