INDEPENDENT ENVIRONMENTAL COMPLIANCE AUDIT REPORT

FOR

SONEPUR-BAZARI OPEN CAST COAL MINE PROJECT
OF
M/s. EASTERN COALFIELDS LIMITED,
(A SUBSIDIARY OF COAL INDIA LTD.)
SANCTORIA, WEST BENGAL

By

ENVIRONMENT MANAGEMENT DIVISION
Directorate of Extension
Indian Council of Forestry Research and Education
(An Autonomous Body of Ministry of Environment, Forest and Climate Change, GoI)
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INTRODUCTION

1.1 INTRODUCTION

M/s. Coal India Limited (CIL) *vide* its letter No. CIL/PMD/36/241 dated 31st July, 2015 communicated the Letter of Award (LoA) for conducting Environmental Audit study for 20 open Cast Mines of its various subsidiaries to the Indian Council of Forestry Research and Education (ICFRE), Dehradun **(Annexure-I)**. The concerned officials from subsidiaries of CIL visited ICFRE during 15-16th January, 2015. A detailed deliberation on the scope of study, methodology and the modality of carrying out the study was held on 16th January, 2015 at ICFRE Board Room **(Annexure-II)**. Further, the proposed methodology was also discussed at length with the team of officials from CIL at Kolkata on 10th April, 2015 before initiating the study **(Annexure-III).** The scope of the environmental audit works are as follows:

1.2 SCOPE OF THE ENVIRONMENTAL AUDIT WORK

1. To review the conditions laid down in the Environmental Clearances (EC) approval for mitigation of environmental pollution.
2. To assess the compliance with the project approval conditions and other approvals of the mine *vis-a-vis* progress of development of the mine.
3. To conduct site inspection, verify the existing levels of pollution *vis-a-vis* the laid down standards; review on-site documentation, monitoring data mechanism in the place for sampling and analysis that are relevant to the audit.
4. Discussion/consultation with the concern project staff on the development consent, other approval conditions, infrastructure and operation to comply the EC.
5. To assess the environmental performance based on the development with the requirements of the approval of EC and the Mining Lease conditions (including any assessment, plans or programs required under these consents/approvals).
6. To assess the progressive mine closure *vis-a-vis* technical; greenbelt development; biological reclamation of overburden (OB), top soil management and review the adequacy of strategies, plans or programs prepared for its effectiveness.
7. To assess the status of final mine closure if reserves have been exhausted.
8. To assess the change detection of open/underground mining activity and reclamation based on a machine learning approach through imagery; advancement in assessment and monitoring.
9. Provision of recommendations if considered necessary for implementation of measures or actions to improve environmental performance of the development, and/or any assessment, plan or program required under the mine approvals.
10. Preparation of individual Environmental Audit Report providing assessment of compliance against each approval condition and provision of recommendations or actions

considered appropriate to improve the environmental performance of the development, and/or the environmental management and monitoring systems.

11. After completion of Environment Audit of each subsidiary, ICFRE shall present an interim report at M/s. CIL or any other place as advised, and
12. ICFRE shall submit final report after incorporating the comments of M/s. CIL and/ or its subsidiaries on the draft report.

Accordingly, the Experts from Environment Management Division of ICFRE have conducted the environmental audit of the Sonepur Bazari OCP of ECL of Coal India Limited during July, 2017 involving experts from its sister institute, Institute of Forest Genetics and Tree Breeding, Coimbatore and other domain experts from the country (**Annexure-IV**). The structure of the Environment Audit report consists of five chapters as outlined below:

Chapter 1- Introduction and Background information on Sonepur Bazari Open Cast Coal Mine Project.

Chapter 2- Audit Methodology: A detailed description of the audit process and scope of the audit.

Chapter 3- Environmental Compliance Audit: An overview of the findings of the audit, including descriptions of compliance and findings from the site inspection in compliance to the EC conditions.

Chapter 4- Audit Findings

The draft report of audit finding was submitted to CIL for needful and comments. The comments of the PP on ICFRE observation were recorded, which were discussed and finalized in the working group meeting with CIL, ICFRE team and the concerned subsidiary on 16th & 17th August 2018 at SCOPE Complex , New Delhi. Accordingly, the post Audit comments and conclusion have been presented in Chapter -5 as has been included in the final report.

Chapter 5- Post Audit comments of PP on Draft audit report of ICFRE and clarification and final comments from ICFRE.

1.3 BACKGROUND INFORMATION ON SONEPUR- BAZARI OPENCAST PROJECT

Eastern Coal Fields Limited (ECL) is one of the eight subsidiaries of CIL and coal producing company of India with its Head Quarters at Sanctoria, Distict Paschim Bardhaman, West Bengal. As on 31st March 2017, there were 87 working mines under ECL of which 60 being underground; 19 opencast and 8 mixed mines. 71 mines are in West Bengal and 16 in Jharkhand.

1.4 LOCATION AND APPROACH

The Sonepur- Bazari Open Cast Project (OCP) mine falls between latitude 23^0 40’ 00” to 23^0 43’ 06” N and longitude 87^0 11’ 14” to 87^0 17’ 42” E and is included in Survey of India Toposheet No.73M/2 & 73M/6. It is located in eastern part of Raniganj coalfields in Paschim Bardhaman

district of West Bengal at a distance of about 15 km from Raniganj and 19 Km from Durgapur township which are connected by Howrah-Delhi line of the Indian railways and national highway of Howrah-Delhi Grand Trunk Road (NH2).

The Pandeveswar Railway Station on Andal-Sainthia line of Eastern Railway is only 5 km from the Project and Ukhra Railway Station is in close proximity to the block.

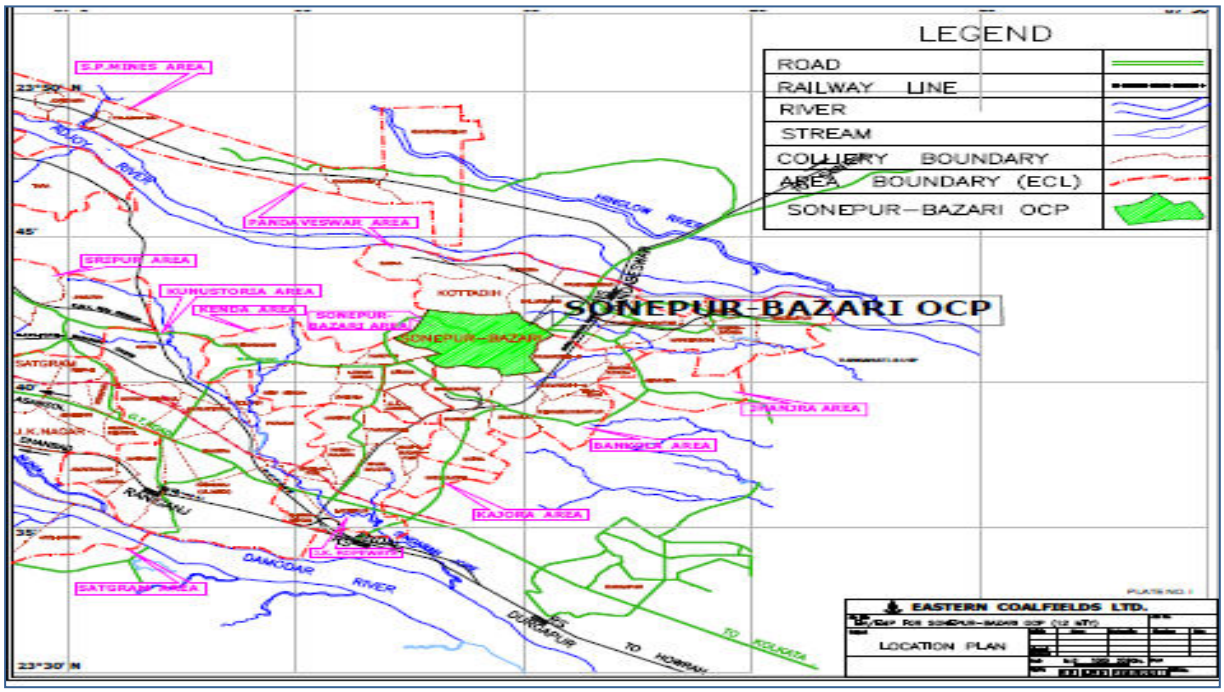

Figure 1.1: Location Plan of Sonepur- Bazari Open Cast Project

1.4.1 Topography, Drainage and Climate

Sonepur -Bazari Block represents a nearly flat topography having altitudes ranging from 114 m to 81 m (105 m to 81m in the quarriable area) above mean sea level. Two seasonal nallahs, viz., Bonbahal Jhore and Kumarkhela Jhore, are found to have originated from near Chora (bordering Sonepur- Bazari Block) and Kumarkhela areas which tend to flow towards northeast and northwest to join Tumni nallah which in turns joins the Ajoy river at a distance of about 6 km from the block.

The area experiences a humid tropical climate with summer lasting from the month of March to May; and winter from the month of November to February. Long term meteorological data generated by India Meteorological Department (IMD) reveals that temperature varies from 2.8^0C (Jan, 1989) to 46. 4^0 (May, 1988); and the relative humidity varies from 15% (April 1989) to 88% (July, 1974). The area has received an annual average rainfall ranging from 1134 to 1547 mm during the period from 2012-16 (IMD) and it indicates that the area is highly prone to erosion. Predominant wind direction is from Southeast and Northeast quadrant during post-monsoon and North and Northeast during winter.

1.4.2 Geology and Exploration

Raniganj Coalfields covers an area of about 1900 sq. km included with in latitudes $23^0$30' and $23^0$52' N and longitudes $86^0$38' to $87^0$23' E. Out of the total basin area, about 1,700 sq.km is coal bearing while about 1500 sq.km area is considered to be potential coal bearing (Geological Survey of India). About 95% of the total area of the coalfield is covered by Burdhwan, Birbhum, Bankura and Purulia districts of West Bengal state and remaining 5% area falls in Dhanbad and Dumka districts of Jharkhand state. The coalfield has an east-west stretch of 75 km and north-south stretch of 35 km.

The Raniganj Coalfields is bounded along north, west and south by Archean Metamorphics. The northern boundary exhibits a natural contact between the Archean basement and the Gondwana while the western and southern boundaries are marked by faulted contacts. The extent of the Gondwana towards east is not precisely known, as the region is covered by alluvium. Regional drilling carried out by Geological Survey of India in the recent years, has established continuity of the coal bearing Raniganj formation in the region (Bistapur-Dandeswar-Domra-Panagarh) further to the east of the present boundary (eastern), which more or less corresponds to the 1200 m depth line with respect to the bottom most co-relatable coal seams.

The Sonepur-Bazari 'A' OCP (9.2 sq.km) is covered by Sonepur - Bazari Sector-I and Sector-I (Extn) Block (totalling 12.5 sq.km) explored by The Central Mine Planning and Design Institute (CMPDI). The approved Project Report (PR) of Sonepur-Bazari 'A' OCP was formulated on the basis of an interim geological report of Sonepur-Bazari Sector-I Block formulated in 1980. At that time, data of 67 boreholes were considered in formulating PR giving a borehole density of 7.2 boreholes/sq. km. The exploration in the Sonepur-Bazari area, however, continued till 1983-84 and the final PR on Sonepur-Bazari Sector-I and Sector-I (Extn) Block have been prepared considering data of 150 boreholes. The project take of Sonepur-Bazari'A' OCP now include 103 boreholes, out of the above 150 boreholes giving a borehole density of 11.2 boreholes/sq. km.

Sector-I lies adjacent to Haripur-Chora-Sankarpur collieries containing coal sequence from R-VII to R-II (R-III/II) and includes Kamarkhela Block (KK-I and KK-II opencast mines) and a part of Haripur extension block (falling in structural continuity with sector-I due to the realigned position of fault marking the southern boundary for the block). Opencast mining is in full operation in this sector under Sonepur-Bazari-A OCP.

Sector-II covers an area of about of 5.2 sq. km and lies to the north of Sonepur-Bazari Sector-I and Sonepur-Bazari-Sector-I extension and adjoins Nakrakunda-Kumardih blocks. Coal seams R-VI to R-II (RIII/II) are present in this sector (R-VIIA and R-VIIB/C seams in crop along south-eastern corner of this sector). The block includes 115 boreholes giving a bore density of 22 boreholes/sq. km.

Sector-III is a narrow elongated block occupying the trough zone (on the down throw side of a major fault with a throw of about 350 m which marks the northern boundary for Sector-II block).

It covers an area of about 3.5 sq. km adjacent to Pandabeshwar-Dalurband and Nakrakunda blocks. The area contains a coal seam starting R-IX as the uppermost seam one. The area is structurally highly complex. The R-VIII (Jambad) seam within its limited extent (dip) of occurrence with steeper gradient offers quarriable prospect. This block includes 83 boreholes giving a borehole density of 23.7 boreholes/sq. km.

The stratigraphic sequence of formation of Raniganj Coalfield as worked out by Geological Survey of India is given below:

Table 1.1: Geological Sequence of Raniganj Coalfield (as per GSI)

Age	Formation	Lithology
Recent & Quaternary	Surface Cover	Alluvium
---------- Unconformity ----------		
Post Gondwana	Igneous Intrusives	Basic (dolerite) dykes, ultra-basic (peridotite) and lamprophyre dykes and sills.
Upper Gondwana	Supra Panchet Formation	Very coarse to coarse grained, red, yellow and grey quartzose sandstone, conglomeratic at places, with bands of dark red silty shale.
---------- Unconformity ----------		
Lower Gondwana	Panchet Formation	Coarse grained greenish sandstone, khaki green silty shale followed by coarse grained yellow feldspathic cross-laminated sandstone, bright red clay with calcareous concretions at places.
	Raniganj Formation	Medium to fine grained, grey, cross-laminated, micaceous, feldspathic sandstone, variety of siltstone and shale, often inter-laminated with fine grained sandstone and coal seam.
	Barren Measures	Thick black to dark grey shale, laminated, fissile shale with occasional bands of sandy, unicolour shale and fine grained sandstone with ironstone bands at places.
	Barakar Formation	Coarse to very coarse grained conglomeratic sandstone, medium grained arkosic to sub-arkosic sandstone, often cross-bedded, variety of shales and sandy shales, fire clay lenses and coal seams.
	Talchir Formation	Tillite or boulder and conglomerate at the base followed by alternating sequence of fine grained khaki or yellowish green, cross-bedded feldspathic sandstone and dark siltstone, silty shale and rythmite shale with occasional clasts.
---------- Unconformity ----------		

Age	Formation	Lithology
Archaean	Metamor-phics	Granite gneiss with migmatitic gneiss, hornblende schists, hornblende gneiss, metabasic rocks and quartz vein etc.

The coal bearing lower Gondwanas are composed mostly of sandstone of varying grain size, grey shales, arenaceous shales, carbonaceous shales, intercalations of shale and sandstone. The rocks are in the greater part of the area dip towards south. The dips are usually 5^{o} to 10^{o}. In the southern part of the coalfield where Cluster No. 9 is located, there are frequent high dips and rolls. The whole basin is traversed by a number of faults with an approximate Northwest-Southeast trend with down throw towards north-east.

Strata in the area under Sonepur-Bazari (Combined) OCP, in general, show a roughly East-West trend with low southerly dip varying from 2° to 5°. But rapid variations in thickness of inter-seam partings have caused sharp swings in trend and steepening of dip (observed in coal seams) at many places. Sonepur-Bazari Sector-I and Sector-I extension block has undergone faulting and as many as 21 faults with variable magnitude and extent are found to have traversed the area. Altogether, seven faults are found to have traversed Sonepur-Bazari Sector-II block. As regards Sector-III of Sonepur-Bazari Block, four normal faults have been deciphered and numbered as F1-F1 to F4-F4.

1.5 BASELINE INFORMATION OF SONEPUR- BAZARI OCP

1.5.1 Status of environmental clearances and coal production

Sonepur- Bazari OCP was granted Environmental Clearance for 3.00 MTPA of coal production *vide* Letter No.J-11015/69/82-EN-5 dated 27th January, 1986, wherein exploitation of Sonepur-Bazari 'A' Geological Block was envisaged.

The coal production during 2001-2002 was 3.40 million tonnes which was in excess of the EC capacity and in view of this; a revised PR for 3.4 MTY was prepared with a project area of 1523.7 Ha. Accordingly, a fresh Environment Impact Assessment (EIA) and Environmental Management Plan (EMP) were prepared and the project was granted environmental clearance for 3.40 MTY *vide* MoEF Letter No. J-11015-92/2006IA. II(M) dated 06.09.2006.

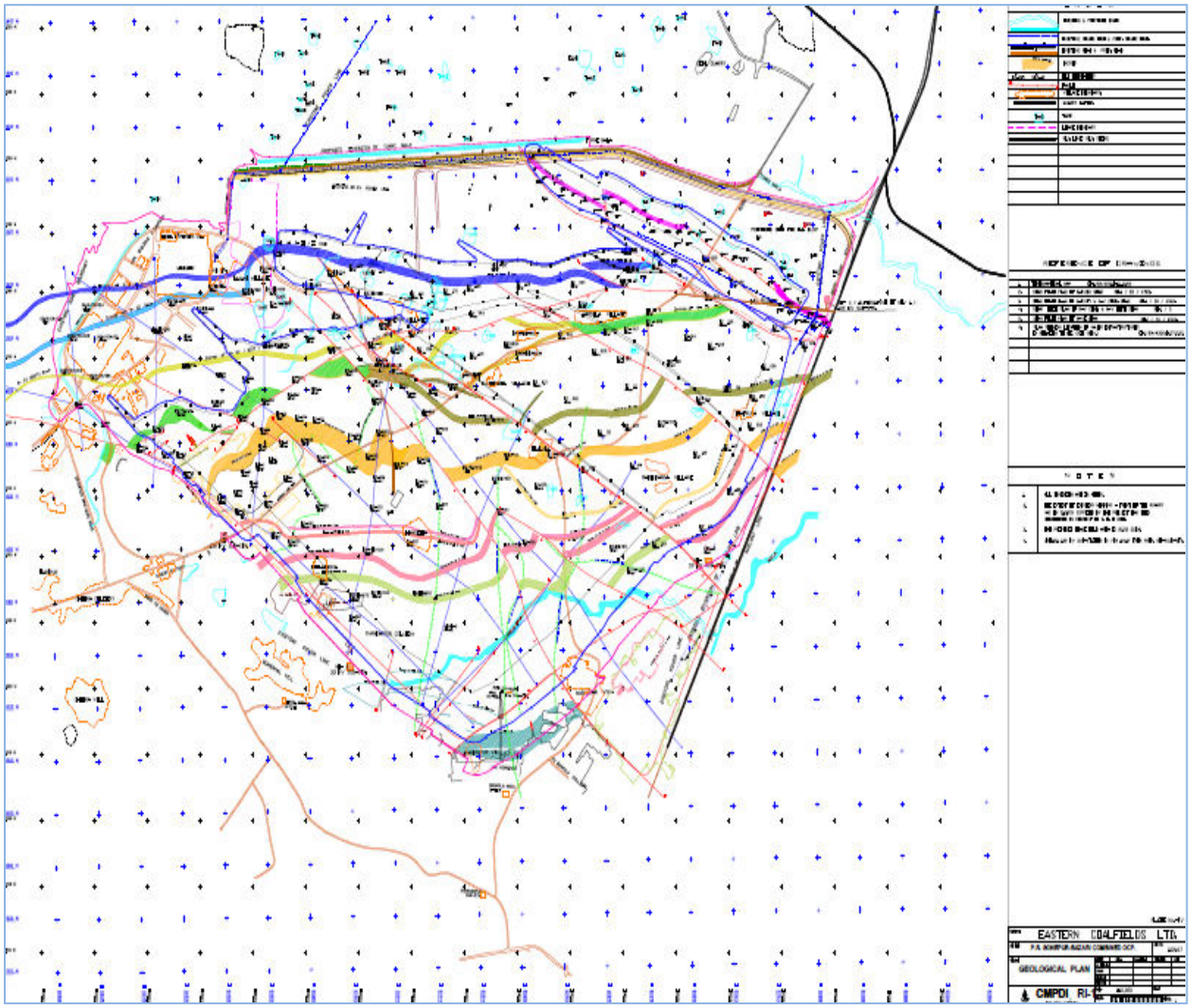

Figure 1.2: Geological map of the Sonepur- Bazari OCP

However, further, another PR for expansion of this mine from 3.4 MTY to 8.00 MTY was prepared and approved in January, 2008. This project envisaged amalgamation of the then Sonepur-Bazari 'A' OCP with virgin Sonepur-Bazari-B and Sonepur-Bazari-C Geological Blocks in order to achieve a targeted annual coal production of 8.00 MTPA with a mine life of 29 years and expansion of project area from 1523.7 ha to 2404.85 ha. Environmental Clearance was accordingly granted for above expansion in 2008 *vide* MoEF Letter No. J-11015-137/2007-IA. II (M) dated 26.6.2008.

A Pre -Feasibility Report (PFR) was prepared as accompaniment of Form-1 application for grant of EC under clause 7(ii) of the EIA Notification 2006 and further circular No. J-11015/30/2004.IA.IIM dated 07.01.2014, whereby the project qualifies for one time capacity addition of 50% of existing capacity or 1.0 MTY whichever is higher. Accordingly to the above circular, enhancement of capacity by 50% of the existing approved capacity of 8.0 MTY, *i.e.,* by an additional 4.0 MTY is possible under the said clause.

A revised calendar plan has been prepared for achieving a peak annual production capacity of 12.0 MTY on the back of the higher level of outsourcing given the fact that there is not much scope for higher capacity utilization of departmental resources. A clusteral EC for 19 mines was granted by MoEF & CC *vide* Letter No. J-11015/76/2011/IA-IIM dated 09.02.2015.

An addendum EIA/ EMP for a peak capacity of 12.0 MTY was prepared. The addendum EIA and EMP addresses the incremental impacts of capacity enhancement on the different environmental aspects. The addendum envisages an appreciable impact on ambient air quality and increase in traffic intensity as direct fall out of the increasing production and dispatch. It also predicted that the incremental impact on air quality will be of temporary nature as the new railway siding for the project is likely to be started within two years of time. Based on this, project was accorded revised EC *vide* Letter No.J-11015/76/2011/IA.IIM dated 03.03.2016 wherein there was no change in capacity of mines but number of mines became 15 instead of 19 after amalgamation.

Diversion of 32.65 ha of forest land was granted *vide* letter No. J-WBC/063/2013/BHU dated 28.03.2017. The combined consent under Air and Water is valid up to 30.04.2019 *vide* Letter No.1035-7/WPBD-cont (620-A) 98 dated 01.06.2016 valid up to 30.04.2019.

The unit possesses authorization under Bio-medical Waste (Management and Handling) Rules, 1989. The project also possesses Directorate General of Mines Safety (DGMS) permissions for use of Heavy Earth Moving Machinery (HEMM) and deep hole drilling and blasting. The project report for 8.00 MTPA has been approved by Board of Directors of CIL in their 286th meeting held on 7th August, 2012. Thus, Sonepur- Bazari OCP has all the relevant statutory approvals for operating at a capacity of 12 MTPA barring hazardous waste authorization.

1.5.2 Reserves and stripping ratio

The net geological reserves of the Sonepur- Bazari (combined) OCP is 407.94 M. Tes. The total residual mineable reserves of the OCP work out to 214.98 M.tes with a corresponding stripping ratio of 5.56 m/te. Mineable reserves are calculated by reducing 10% of net geological reserves from net geological reserves.

Table 1.2: Seam wise Geological Reserves of Sonepur-Bazari OCP

Block	Seam	RESERVE	GRADE
SONEPUR-BAZARI SECTOR-I & EXTN	R-VII	19.95	G4
	R-VII A	16.69	G4
	R-VII B+C	8.91	G4
	R-VII B	2.62	G4
	R-VI	28.30	G4-G5
	R-VI Top	5.62	G4-G5
	R-VI	25.82	G4-G5
	R-V	13.55	G4-G5
	R-V Top	22.13	G4-G5
	R-V Bottom	2.45	G4-G5
	R-V+IV	1.33	G4-G5
	R-IV Top	16.68	G4-G5
	R-IV	35.83	G4-G5
	R-IV	27.51	G4-G5
	R-III	46.11	G4
	R-II	31.76	G4
	R-III/II	0.51	G4
	TOTAL	**305.77**	
SONEPUR BAZAR-II	R-VII A	0.58	G4
	R-VII B+C	1.31	G4
	R-VI Top	1.21	G4-G5
	R-VI	7.72	G4-G5
	R-V Top	8.57	G4-G5
	R-IV Top	2.01	G4-G5
	R-IV	5.32	G4-G5
	R-IV	31.22	G4-G5
	R-III	14.21	G4
	R-II	9.65	G4
	R-III/II	14.34	G4
	TOTAL	**96.15**	
SONEPUR BAZAR-III	R-	5.03	G4-G5
	R-VIII	0.99	G4-G5
	TOTAL	6.02	
GRAND		**407.94**	

Source: Mining Plan for cluster 12 Oct 2015

Total quarry wise coal reserves evaluated as per the approved PR at project inception are given in table 1.3.

Table 1.3: Coal Reserves, Overburden and Stripping Ratio

Quarry	OB ($Mm^{3)}$	Coal (Mt)	S.R. (m^3/te)
1	750.88	141.14	5.31
Hansidiha Patch	15.71	2.91	5.40
2A	230.48	39.51	5.83
2B	107.92	20.59	5.24
3	48.33	4.18	11.56
1A	12.5	2.11	5.92
2C	15.01	2.28	6.58
2D	13.67	1.96	6.97
Total	1194.5	214.98	5.56

Source: Addenda EIA/EMP (Expansion 8.00MTY to 12.0MTY)

Since the PR was prepared on the basis of total mineable reserve of 214.98 MT, the balance quantity of coal and volume of OB within the pit limit of quarry as on 01-04-2015 is 214.98 - 36.407 = 178.57 MT of coal and 1194.5 – 156.9 = 1037.60 M.Cum of OB is described below:

Table 1.4: Balance Coal Reserves and Overburden with Stripping Ratio

Parameter	Coal (Mt)	OB (Mm^3)	S.R. (M^3/te)
Total Reserve considered in PR	214.98	1194.50	5.56
Total production till 2014-15 (expected)	36.407	156.92	4.31
Available reserves	178.57	1037.58	5.81

Source: Addenda EIA/EMP (Expansion 8.00 MTY to 12.0 MTY)

1.5.3. Land Ownership

Total 2404.85 ha of the land has been acquired under CBA/LA Acts and direct purchases out of which presently 1594.66 ha of land is under possession of the mines. It was informed by project authorities that 1322 employments have been provided till date against land acquisition and further employment to 997 land losers will be provided after physical possession of the rest of the 810.198 ha land which is under progress. The details of land acquisition are provided below:

Table 1.5 Land Acquisition and Ownership details

Mode of acquisition of land (Ha)	Till date (April 2014) acquisition (Ha)	Till date (30.04.2014) possession and employment provided		Balance to be possessed and employment provided		Approval to be taken for physical possession of land
		Land (Ha)	Employment details	Land (Ha)	Employment details	
CBA Act Phase-1	68.01	390.15	Provided	Nil	Nil	

Mode of acquisition of land (Ha)	Till date (April 2014) acquisition (Ha)	Till date (30.04.2014) possession and employment provided		Balance to be possessed and employment provided		Approval to be taken for physical possession of land
		Land (Ha)	Employment details	Land (Ha)	Employment details	
68.01						
CBA Act Phase-2 547	547	390.15	Provided against land possessed	156.85	193	16.39 Ha of land of Mouza Konardihi acquired under CBA Act is to be taken possession and 20 No. employments are to be provided
CBA Act Phase-3 1200	1200	546.66	Provided against land possessed	653.34	804	Approval given for taking possession of entire 1200 Ha land
LA Act 398.54	398.54	398.54	Provided	Nil	Nil	
Inherited 38.58	38.58	38.58	Nil	Nil	Nil	
Govt. Land 42.65	42.65	42.65	Nil	Nil	Nil	
Direct purchase Phase-1 110.07	110.07	110.07	Provided against direct land purchase	Nil	Nil	
Total	**2404.85**	**1594.66**	**1322**	**810.19**	**997**	

Source: Mining Plan Sonepur-Bazari

1.5.4 Status of mine lease area

Land use/cover mapping based on IRS-P6/ LISS-III data for the project area has been carried out. Based on the satellite map of the project area, the present land use of the project is tabulated below:

Table 1.6 Present Land use of Sonepur-Bazari

S. No.	Land Use Type	Present Land Use (Ha)
1	Excavated Area including Haul Road	466
2	Undisturbed Area	1225.4
3	Colliery Infrastructure/ Built up	135.45
4	Villages	28.59
5	External OB dumps (Active)	60
6	Plantation on External OB Dumps	5
7	CHP	--
8	Railway Siding	--
9	Road	9.5
10	Nala	38.21
11	Tanks	18.62
12	Lagoon	--
13	Green Belt/Plantation	82
14	Backfill Area (Active)	222.21
15	Plantation on Backfilled Areas	3.03
Total		**2293.98**
Land outside Project Area		
Project Township and Rehab Site		110.87
Gross Total		**2404.85**

Source: Addenda EIA/EMP (Expansion 8.00 MTY to 12.0 MTY)

1.5.5 Geo-mining Parameters

Mine parameters (Quarry-wise) for Sonepur- Bazari OCP as per the approved PR for 8 MTPA is given as under:

Table 1.7: Geo-mining characteristics of Sonepur- Bazari OCP

Parameters	Dimensions						
	Quarry-1	Quarry-2A	Quarry-2B	Quarry-3	Quarry-1A	Quarry-2C	Quarry-2D
Area in surface (m^2)	8214326	3326018	1406870	987788	410764	209768	364205
Area in flow (m^2)	6569452	2951983	1088986	521645	369876	170957	278555
Base Seem	R-IV(B)	R-IV	R-III/II	R-VIII	R-IV(B)	R-III/II & R-II	R-III/II & R-II
Strike length in surface (m)	2404	997	750	2876	388	430	979
Strike length in flow (m)	2089	997	656	2752	388	430	864
Dip rise length in surface (m)	3815	3183	2184	358	1013	410	403
Dip rise length in flow (m)	3544	2830	1950	187	991	332	332
Depth at entry (m)	10	25	20	20	15	13	16
Final depth (m)	245	165	163	130	85	53	52

Source: Addenda to EIA/EMP (Expansion 8.00 MTY to 12.0 MTY)

1.5.6 Departmental and Outsourced Operations

(a) Departmental operations are carried out for drilling and blasting in all the three quarries.
(b) OB removal on top seam is carried out contractually. Only miner OB removal is carried out by departmentally in floor seam in Quarry-1.
(c) Entire production from Quarry-2, Quarry-3 and seam-VII at Quarry-1 is being done contractually by deploying surface mines.
(d) Production of coal at Seam–VII at Quarry-1 is carried out contractually.
(e) Production in quarry no-1 is done departmentally barring Seam-7 by deploying 10 Cu.M/ 12 Cu.M excavators and 10/12 tonne dumpers.

1.6 MINING OPERATIONS

1.6.1 Coal Seams to be exploited

The entire coal bearing Sonepur-Bazari Block (A, B and C) covers an area of about 25 sq.km. The coal seams in the OCP are in sequence from R-VIII to R-II.

Sequence of seam and intervening parting along with their thickness are given below:

Table1.8. Sequence of Seam and intervening parting with thickness

Coal Seam (m)	Parting(m) with overlying seam	Usual thickness range(m)	
R-VIII		6.93	– 13.95
R- VII		4.00	– 4.60
R-VIIA	9 to 24	2.50	– 3.45
R-VIIB+C	8 to 12	1.60	– 2.35
R-VIIB	7 to 20	1.00	– 1.65
R-VI(Top)	10 to 35	1.00	– 1.60
R-VI	25 to 37 (with R-VIIB/R-VIIB+C)	7.00	– 8.00 (In the split zone)
R-VI(B & T)	0 to 35 (with R-VI top)	5.70	– 6.40 (In the split zone)
R-V(comb.)	27 to 35	5.00	– 5.90
R-V(Top)	16 to 38	3.15	– 3.97
R-V(Bottom)	0 to 17	1.08	– 1.67
R-V+R-IV(Top)	30 to 48 (with R-VI)	8.50	- 10.40
R-IV(Top)	0 to 30 (with R-V comb.)	2.00	- 3.40
	4 to 35(with R-V Bottom)		
R-IV(Bottom)	20 to 44(with R-V+IV(Top)	Around 4.00	
	0 to 35 (with R-IV Top)		
R-IV(T + B)	48 to 71(with R-V Top)	8.50	– 9.40
R – III	25 to 42(with R-IV Bottom)	2.50	– 3.50
	23 to 31(with R-IV Top+Bottom)		
R- II	0 to 40	1.15 – 2.50	
R-III/II	-	5.40 – 5.57	

Source: Mining Plan for 12 MTY

1.6.2 Brief Description of Mining Operation

Entire mining lease (ML) area of Sonepur- Bazari OCP has numerous fault zones, out of which some are major faults and mining operations in the OCP is divided into three sectors *i.e.,* Sector-I between F6-F6 and F10-F10, Sector-II between F10-F10 and F14-F14 and Sector-III between F14-F14 and F2-F2. There are 7 coal seams namely, R-8 to R-2 occurring within ML, although all the coal seams are not occurring in all the three sectors. Topmost and bottommost seam is R-8 and R-2 respectively. Occurrence of coal seams in typical borehole sections is given in table 1.9.

Table 1.9: Occurrence of Coal Seam in Typical Bore Hole Sections

Sector-I: Borehole No. B2/00/063	Surface RL	94.50 m
	OB Thickness	25.00 m
	R-VII Seam	4.05 m
	Sandstone parting	10.10 m
	R-VII A Seam	3.64 m
	Sandstone parting	15.00 m
	R-VII B Seam	1.60 m
	Sandstone parting	4.00 m
	R-VII C Seam	0.60 m
	Sandstone parting	40.00 m
	R-VI Seam	8.02 m
	Sandstone parting	27.00 m
	R-V Seam	4.98 m
	Sandstone parting	17.00 m
	R-IV Top Seam	2.53 m
	Sandstone parting	26.73 m
	R-IV Bottom Seam	4.9 m
Sector-II Borehole No. BZ0032	Top RL	93.95 m
	OB Thickness	31.67 m
	R-V Top Seam	3.34 m
	Sandstone parting	60.00 m
	R-IV Seam (Combined)	8.00 m
	Sandstone parting	32.00 m
	R-III Seam	3.15 m
	Sandstone parting	30.00 m
	R-II Seam	1.95 m
Sector-III Borehole No. SBZ-III/15	Top RL	87.41 m
	Top OB	46.00 m
	R-VIII Top Seam	0.81 m
	Sandstone parting	2.30 m
	R-VIII Middle & Bottom (Combined Seam)	10.38 m

Seam is dipping very steeply in Sector-III at 1 in 2.31 gradients.

1. Outsourcing

There is no clarity on departmental and outsourcing operations, while all operations in Sector-II and Sector-III are outsourced. In Sector-I, OB removal in some patches is departmental and also coal extraction is done departmentally, while most of the operations at various patches are outsourced. Some of the details are as under:

(i) Sector-I: East-West direction (Sector-A)

From top most level of quarry (95.0 m RL) till floor of R-VII C coal seam, OB removal and coal extraction is done by hired agency i.e., CMAT Ltd., while OB is removed by drilling, blasting and deploying 3 to 3.4 Cu.m backhoe excavators and 25 tonnes dump trucks; coal is extracted by deploying surface miners. Bench height in OB is maintained as 6 m and width 8-10 m. 30 m sandstone parting between R-VII C seam and R-VI seam is excavated through hired agency i.e., AKT-PRE Pvt. Ltd., by deploying 3 to 3.4 Cu.m backhoe excavators and 25 tonnes dump trucks. Height and width of bench is maintained as 6 m and 8-10 m respectively.

Coal from R-VI seam, having a thickness of 8 m is extracted departmentally by drilling and blasting as run-of- mine (ROM) coal. However, loading and transportation of ROM coal to coal handling plant (CHP) is done through hired agency.

Working below R-VI coal seam and up to top of R-IV coal seam is departmental both of OB removal and coal extraction as mentioned under:

Sandstone parting between R-VI seam and R-V Top seam	20.00 m
R-V Top coal seam	3.26 m
Sandstone parting	10.00 m
R-V Bottom coal seam	0.85 m
Sandstone parting	27.00 m
R-IV Top coal seam	2.30 m
Sandstone parting	28.00 m

Sandstone parting of 28.0 m between R-IV top and R-IV bottom seams is excavated by dragline, which is a departmental operation and such excavated OB is backfilled in de-coaled area. As the dragline is under breakdown from June 2016 onwards, mining operations in this section of Sector-A are suspended. For dragline operation, bench height and width is maintained as 30 m and 60 m respectively.

Bottommost coal seam in this section is R-IV bottom seam having a thickness of 4.0 m, which was extracted by hired agency by deploying surface miner. Floor of R-IV bottom coal seam -55 m RL and total depth of quarry from topmost RL is 150 m.

(ii) Sector-I: North-South direction (Section B)

From top most level of quarry (98 m RL) till top of R-V top seam, OB removal and coal extraction is done by hired agency i.e., M/s. SPDJV by drilling and blasting and deploying 3.0 to 3.4 Cu.m backhoe excavators and 25.0 tonne dump trucks for OB and surface miner for

extraction of coal from R-VI coal seam. Operations from R-V seam till bottom of R-IV seam is done departmentally as under:

R-V Top coal seam	3.00 m
Sandstone parting	20.00 m
R-V Bottom coal seam	0.85 to 1.00 m
Sandstone parting	27.00 m
R-IV Top coal seam	2.30 m
Sandstone parting	32.00 m
R-IV bottom coal seam	4.0 m

All the operations connected with OB excavation and coal extraction is done departmentally by drilling and blasting and shovel dumper combination. Run- of- mine (ROM) coal from the mine face to CHP is transported by hired agency. 32.0 m sandstone parting between R-IV top coal seam and R-IV bottom coal seam is excavated by dragline (Departmental). As dragline is under breakdown since June 2017, operations in this section are not being carried out. Total depth of quarry in this section (up to R-IV seam bottom) is 153 m.

(iii) Sector-I: N-S direction (Section C)

Entire operations in this section are outsourced to M/s. Mahalaxmi KLPJV. Topmost RL of this section is 90 m. It has occurrence of R-V top, R-V bottom, R-IV top and R-IV bottom coal seams. Sandstone, OB/parting is removed by deploying 3.0 to 3.4 Cu.m backhoe excavators and 25.0 tonnes dump trucks and coal is extracted by deploying surface miners. Bottommost RL (floor of R-IV bottom seam) is -55 m and total depth of quarry in this section is 145 m. Average gradient of coal seams in Sector-I is 1 in 10.

(iv) Sector-II: Section-A (NW-SE direction)

Here top RL is 95 m (Surface RL). It has a sandstone OB of 40 m and below that 5.6 m thick R-III and R-II combined coal seam. This area is already de-coaled. All operations were carried out by outsourcing to M/s. Mahalaxmi Pvt. Ltd. Coal was extracted by deploying surface miner.

(v) Sector-II: Section-B (N-S direction):

It has occurrence of R-IV top, R-IV bottom and R-II and R-III combined coal seams. Here also all the operations are outsourced to M/s. EIPL. While OB/parting is removed by deploying shovel-dumper combination, coal is extracted by deploying surface miner.

(vi) Sector-II: Section-B (North West-South East direction)

This section is located after crossing NH-60 (which is passing through ML). Here the occurrence of coal seams is R-IV top, R-IV bottom, R-III and R-II. Entire operations are outsourced to M/s.

Nilkanth Mahalaxmi JV. Here also shovel-dumper combination is used for OB removal and surface miner for coal extraction.

(vii) Sector-II: Section-D (South-North direction)

It is an extension of Section-D, but has occurrence of only one coal seam i.e., R-V top (3.5 m thick) and no coal seam occurs below R-V top coal seam. Here also all operations are outsourced to M/s. Nilkanth Mahalaxmi JV. Bottommost RL in Sector-II is -3.57 m and depth of the quarry is 98.57 m.

(viii) Sector-III:

It is located between fault F14 – F14 and F2 – F2. Here top RL is 96 m. Only one coal seam (R-VIII) occurs in this sector, having a very steep gradient of 1 in 2.30. Seam thickness is 10-12 m and due to steep gradient of coal seam, parting (OB) varies from 10 m to 120 m. Here also all operations are outsourced to M/s. ICL Pvt. Ltd. OB as well as coal was excavated by shovel-dumper combination and ROM coal was fed to mobile crusher for sizing to -100 mm. Presently, DGMS has imposed Section-22 of Mines Act, 1952 and all the operations are completely stopped (except pumping of water accumulated at coal seam floor).

Table 1.10: General Scheme of operations in each sector

Sector/Patch	Length (Km)	Width (Km)	Depth (m)	Bench height (m)	Bench Width (m)	Surface RL (m)
Sector-I						
CMAT	1.85	0.44	54.65	6	10	94.50
AKT-RRE	0.88	0.26	93.82	6	10	94.50
Hansdiha	0.79	0.70	74.00	6	10	96.00
Departmental	2.26	0.36	159.00	12	20	99.36
Sector-II						
Quarry 2A Part A EIPL	1.50	0.40	77.64	6	10	97.64
Quarry 2A Part A ML-NK	1.10	1.03	103.54	6	10	93.54
Sector-III						
ICL	2.81	0.37	75.00	6	10	87.41

Operation in all outsourced patch is by surface miner/hydraulic excavator and dumpers.

1.6.2.1 Waste Dumping

As per the surface plan and physical verification of the ML area, it was noticed seven external OB dumps and four internal backfilled OB dumps. Most of the internal OB dumps are in continuity with the external OB dumps separated by mine haul road.

External OB Dumps

(1) External OB Dump-A 4

It is an inactive external OB dump. The dump is located in an area 40.74 ha, towards western side of the ML area. The height of the dump is about 55 m and its slope angle is about 40-45 degrees and having about 2-3 terraces.

(2) External OB Dump-B

It is located in an area of 25.37 ha, located towards southern side of quarry-2D. The dump height is 50 m and slope angle is about 45 degrees. There are 2 terraces observed on the dump.

(3) External OB Dump-G

It is an active dump and located in an area of 11.46 ha, towards north of Quarry-2D. The dump has 3 terraces and its height is 25 to 30 m and its slope angle is about 45 to 50 degrees.

(4) External OB Dump-C

It is an active dump and is located in an area 85 Ha, towards northern side of Quarry-2A. There are 3-5 terraces made on this dump. Its height is about 50 m and slope angle is about 45 degrees.

(5) External OB Dump-D

It is an inactive dump and is located in an area of 21.18 ha towards north of Quarry-3. There are 3-4 terraces have been observed on the dump. Its height is about 25 m and an average slope angle of about 35 degrees.

(6) External OB Dump-E

It is an inactive dump and is located in an area 46.71 ha towards northern side of Quarry-3. A total of 3-5 terraces have been observed on the dump and its overall height is about 30 to 40 m and slope angle is about 40 to 45 degrees.

(7) External OB Dump – A 5

It is an encroached inactive dump located in an area of 44.29 ha outside the ML area towards western side. Its overall height is about 60 to 70 m and slope angle is about 35 to 40 degrees.

Internal Backfilling OB Dump

There are 04 (four) internal backfilled OB dump areas noticed in the de-coaled area.

(1) Internal Backfilled Dump – A 1

It is located in an area of 34.0 ha western side of ML almost in between OB dumps A-4 and A-5 and is having 2 terraces. Its height is about 30 to 40 m and slope angle is about 40 degrees.

(2) Internal Backfilled Dump – A 2

It is an active area located in an area of 168 ha towards south of Quarry-1A and is having 6-7 terraces. Its height is about 70-80 m from the present bottom of the pit and slope angle is about 30-35 degrees.

(3) Internal Backfilled Dump – A 3

It is located south of Quarry-3 and external Dump-D in an area of 23 ha and is having 2-3 terraces. The height of the dump is about 45 m and its slope angle is about 40 degrees.

(4) Internal Backfilled Dump – A 6

It is an active internal backfilled dump located in an area of 8.5 ha in north of Quarry-2A. Its height is about 35 to 40 m and slope angle is about 40 to 50 degrees and is having 3-4 terraces.

1.6.2.2 Haul Roads

Length of haul road for OB transportation varies from 2-3 km to 6-7 km (one way) for different sections/sectors. Haul road for transportation of coal to CHP or railway siding varies from 5-6 km to 13-14 km (one way).

1.6.2.3 Design Parameters

i) Mine is operated for 3 shifts/day of 8 hrs each and all 364 days a year.
ii) Bench height permissible in OB/parting between coal seams is 13 m (max.). Departmental, and 6 to 8 m in outsourced patches.
iii) Parting between coal seams varies from13 to 52 m.
iv) Monthly planned OB excavation: Departmental 36, 50, 000 m^3 and 5, 50, 000 m^3 Outsourced.
v) Monthly planned coal extraction: Departmental 1, 80,000 and 4.10,000 Te outsourced.

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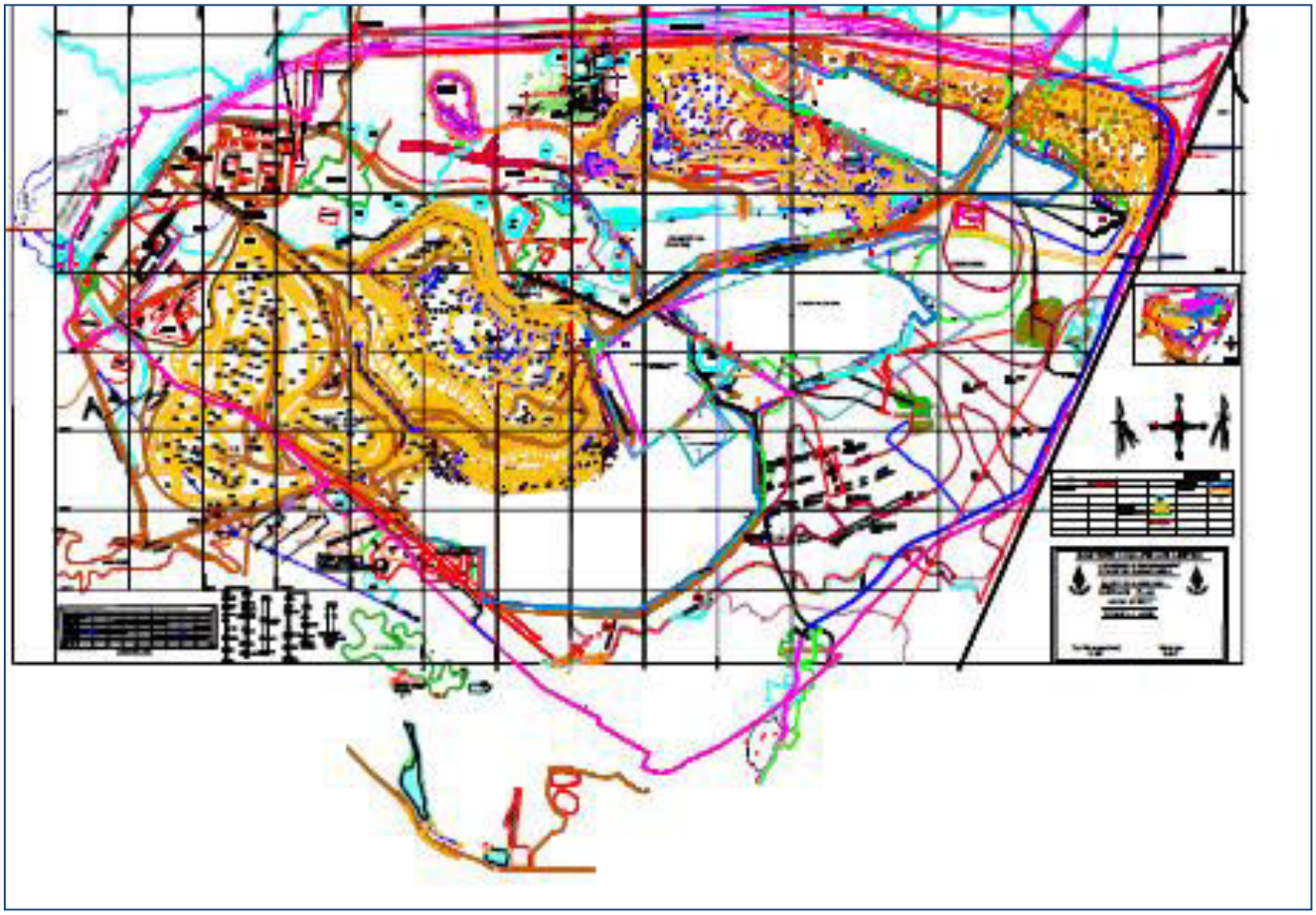

Figure 1.3: Working Plan of Sonepur- Bazari OCP

The details of the operations handled by the outsourced are given in table 1.11.

Table 1.11: Details of Mining Operations of Sonepur- Bazari OCP

Activity	Departmental	Outsourced
Drilling Sector-1 Coal Seam R-V11 TO R-V11C		Outsourced
Blasting Sector-1 Coal Seam R-V11 TO R-V11C	Departmental	
OB removal for R-V11 to R-V11C		Outsourced
Coal extraction by Surface Miner R-V11 to R-V11C		Outsourced
Drilling Sector-1 Coal Seam R-V11 Floor to R-V1 (Parting) Sector-1 Hired Patch		Outsourced

Activity	Departmental	Outsourced
Blasting Sector-1 Coal Seam R-V11 Floor to R-V1 (Parting) Sector-1 Hired Patch	Departmental	
OB removal for R-V11 to R-V11 Floor to R-V1 (Parting) Sector-1 Hired Patch		Outsourced
Coal extraction by Shovel-Dumper Combination Sector-1 Hired Patch		Outsourced
Drilling Sector-1 Coal Seam R-V1 Floor to R-V (Top)Parting 3.76 Mt Hired Patch		Outsourced
Blasting Sector-1 Coal Seam R-V1 Floor to R-V (Top)Parting3.76 Mt Hired Patch	Departmental	
OB removal for R-V1 Floor to R-V (Top) 3.76 Mt Hired Patch		Outsourced
Coal extraction by Shovel-Dumper Combination3.76 Mt Hired Patch		Outsourced
Drilling Sector-1 Surface to R-1V Bottom(Hansdiha-III)		Outsourced
Blasting Sector-1 Surface to R-1V Bottom(Hansdiha-III)	Departmental	
OB removal for Surface to R-1V Bottom (Hansdiha-III)		Outsourced
Coal extraction by Surface Miner(Hansdiha-III)		Outsourced
Drilling Sector-1 Surface to R-1V Bottom(Departmental)	Departmental	
Blasting Sector-1 Surface to R-1V Bottom(Departmental)	Departmental	
OB removal for Surface to R-1V Bottom (Departmental)	Departmental	
Coal extraction by Shovel-Dumper Combination	Departmental	
Sector-II Part-A	Blasting Departmental	Drilling Outsourced

Activity	Departmental	Outsourced
Sector-II Part-A		OB Removal Outsourced, Coal Extraction by Surface Miner outsourced
Sector –II Part-B	Blasting Departmental	Drilling Outsourced
Sector –II Part-B		OB Removal Outsourced, Coal Extraction by Surface Miner outsourced
Sector-III	Blasting Departmental	Drilling Outsourced
		OB Removal Outsourced, Coal Extraction by Shovel-Dumper Combination

1.6.3 Drilling and Blasting Operations

Drilling for departmental operations for OB excavation is done by deploying 260 mm dia. IDM-70 BHDS. 10 m hole is drilled for a bench height of 10 m with spacing and burden of 6 m and 5 m respectively. Drilling for outsourced operations for OB excavation is done by deploying truck mounted percussion drills. Hole diameter is 160 mm and for a bench height of 6 m, 6 m deep hole is drilled with spacing and burden of 5 m and 4 m respectively.

Table 1.12: Mining system parameters

S. No.	Particulars	Unit	Overburden		Coal
			Dragline	Shovel	
1	Breach height	m	22-32	13	1-13
2	Working bench width	m	60	30-40	-
3	Bench slope	Degree	70	70	80
4	Blast hole dia	mm	250	250	160

In all the blast hole drills only dust exaction system is operative and no wet drilling is being done, although wet drilling arrangement is provided.

Blasting is carried out by using Site Mixed Slurry (SMS) as bulk explosive supplied by approved explosive manufacturers such as M/s. IDL, M/s. IEL, M/s. Indian Oil, M/s. Premier Explosives, etc. Blasting accessories such as cord relays, boosters and fuse detonators are drawn from M/s. ECL explosive magazine.

1.6.4. Coal Handling, Transport & Dispatches

Presently coal is extracted from four different sectors, viz., CMAT Hired Patch, Hansdiha-III Hired patch, Q-2A (Part-A) and Hired Patch Q-2A (Part-A) Hired Patch. Coal from quarry-1 barring topmost seam ((R-VII) is outsourced. The ROM coal from the mine is transported to the

receiving pit. There are 2 Nos. of hopper of 250 tonnes capacity. Rock breakers are provided at the hoppers to break big size (+400 mm) coal blocks. Coal is then fed through apron feeders to 2 Nos. of roll crushers each having 1200 TPH capacity. ROM coal is crushed to -200 mm size. Crushed coal is transported through belt conveyor system to 2 Nos. secondary double roll crusher each having capacity of 600 TPH. The coal is crushed to -100 mm and discharged through chute and stacked on ground. The crushed coal is stock piled at Dump-1 and 2. Coal from Dump-2 is transported to Sitalpur siding at a lead distance of 5-6 Kms. Stocks Dump-2 also receives Coal from Dump-1, depending upon availability of rakes at Sitapur Siding. The Sitalpur siding also gets crushed coal from surface miner operation which is outsourced from CMAT Hired Patch with a lead distance of 6-7 Kms, Hansdiha-III Hired Patch with lead distance of 11-12 Km and Q-2A (Part-B) with lead distance of 13-14 Kms. The Dalurbandh Railway siding gets coal from surface miners operation at Q-2A (Part-B and A) with lead distance of 6-7 km and from Dump-1 with lead distance of 11-12 km.

1.7 Rehabilitation and Resettlement

A total of 2284 PAFs living in 12 villages were proposed to be rehabilitated for the project. However, with the present count, the number of PAFs has increased to 3365. Eleven out of the twelve villages is still remain to be shifted. A few villages have been partially rehabilitated and it is targeted that R&R of all the 11 remaining villages will be completed by the year 2020-21. The present status of rehabilitation along with other details is given below:

S. No.	Villages to be rehabilitated	No. of PAFs rehabilitated/to be rehabilitated			Target year of rehabilitation	Cost already incurred (Lakhs)	Remarks
		No. of PAFs	As per present status (2014)				
			Already rehabilitated	To be rehabilitated			
Under previous PR & EC of 1986 (3.0 MTY)							
1	Punjabi Dunga	119	119	--	2000	915	
2	Hansdiha	2010	210	--	2004		
3	Sonepur (Ruidaspara)	64	64	--	1996		Part rehabilitation, full rehabilitation considered in PR 2007
4	Bheladanga	94	94	--	2006		Mentioned again in PR 2007 as some families were still residing
Under present PR and EC of 2008 (8.0 MTY)							
S.	**Villages to**	**No. of PAFs rehabilitated/to be**			**Target year**	**Cost**	**Remarks**

No.	be rehabilitated	rehabilitated				of rehabilitation	already incurred (Lakhs)	
		No. of PAFs		As per present status (2014)				
				Already rehabilitated	To be rehabilitated			
		As per PR	As per present count					
1	Bheladanga	94	--	94	--	2006		Area Cleared in 2007
2	Arsula	100	250	29	221	2014-15	400	Ongoing
3	Bhaluka	55	178		178	2014-15	275	Ongoing
4	Kuchberia	50	79		79	2014-15	89	Ongoing
5	Basabdanga	100	134		134	2014-15	192	Ongoing
6	Bandhghat	30	74		74	2014-15	60	Ongoing
7	Sonepur (Ruidaspara)	550	900		900	2016-17		To be Taken Up
8	Madhudanga	130	400		400	2019-20		To be Taken Up
9	Bhatmura	130	150		150	2019-20		To be Taken Up
10	Bazari	385	450		450	2019-20		To be Taken Up
11	Nabagram	500	800		800	2019-20		To be Taken Up
12	Shankarpur	160	250		250	2019-20		To be Taken Up
Total			3665	29	3636	2020-21	1060	

Source: PR of Sonepur-Bazari (8.00 MTY to 12 MTY)

R & R is carried out as per the R & R policy of M/s. Coal India Ltd., which offers a better package than the R& R recommendations. Till date 1322 employments have been provided against land acquisition for the project since inception in 1992. Besides this, 997 more employments will be provided in future.

Most of the villages are being shifted to Dahuka Mouza near Dahuka village. The RC envisages certain additional provisions for certain environmental protection measures over provision of approved PR considering mainly the Sonepur -Bazari package for compensation to the land losers and resettlement of villages.

CHAPTER - 2
AUDIT METHODOLOGY

The audit methodology adopted include discussion with the personnel from the mine authorities related to the project, desk review of documentation and copies of records provided by project proponent of Sonepur-Bazari OCP; working group meetings and site inspection to assess the level of environment performance and compliance of environmental conditions stipulated by MoEF & CC., Govt. of India. The audit processes covers the scope of the work order provided by the CIL and are described in detail below:

2.1 OPENING MEETING

The audit process commenced with an opening meeting on 1st July 2017 with Sri. B. N. Prasad, General Manager (Env.) and other concerned officials of the Sonepur-Bazari OCP to introduce the audit scope and their responsibility in facilitating the process. The purpose, depth and the scope of the audit were outlined and the methods were explained. Further, requirement of documents to review such as various management plans, project report, mine closure plan, and periodical reports submitted to various regulatory agencies to address specific compliance requirement particularly those relevant to address the scope of the study were discussed and deliberated.

2.1.1 Consultation

Interaction meetings were conducted with the concerned officials and staff dealing with the project to understand the regulatory and statutory process followed for the mine. During the process of consultation, in-depth discussion were held with Shri. S. K. Sinha, Chief Manager (Mining) HQs.; Shri. S. Chakravorty, Assistant Manager (Env.) HQs.; Shri. Purushotam Banerjee, Assistant Manager (Env.) HQs.; Shri. R. Rajesh, Assistant Manager (Env.) HQs.; Shri. R. R. Amitabh , Agent, Sonepur-Bazari OCP; Shri. U. K. Pal, Manager (Mining); Shri. U.K. Mukerjee, Survey Officer; Shri. D. A. Ragit, Sr. Manager, Sonepur- Bazari OCP Area; Shri. T. Dutta, Dy. CMO, Sonepur- Bazari OCP; Shri. Dey, Safety Officer, Sonepur- Bazari OCP Area; Shri Suvendu Gayen, Asst. Manager (CD), SB Area.

2.1.2 Desk Review

The available documents were exhaustively desk reviewed for generation of information and the gaps in compliance to environmental clearance conditions; relevant information generated was used for detailed discussion with the concerned officials.

2.2 DATA COLLECTION AND VERIFICATION

The team verified the documents, such as letter from the MoEF&CC according environmental clearance, forest clearance approved till date, Environmental Impact Assessment (EIA) and Environment Management Plan (EMP), Project report prepared by Central Mine Planning and

Design Institute Ltd., in December, 2009 and also all other statutory approvals like No Objection Certificate (NOC) from State Pollution Control Board (SPCB), Directorate General of Mines Safety (DGMS) permission and all periodical reports submitted to various regulatory agencies etc., were reviewed.

The documents were desk reviewed for collection of data prior to the onsite audit to verify the implementation process. Wherever the document was not available, detailed discussion were held with the relevant personnel and accordingly pointed out in the audit report for further implementation. In addition, the statements provided by the Project Personnel (PP) were also verified by desk reviewing the document and during site inspection. Wherever suitable verification could not be obtained, the same has been identified in the audit process and suitable suggestion has been provided for future course of action.

2.3 SITE INSPECTIONS

A detailed site inspection from 2nd to 4th July, 2017 of the key areas of the mine was carried out as part of the audit process. Following areas were inspected during the inspection:

- Mining Operation
- The haulage road
- Site facilities
- Coal crushing and conveyor system
- Coal Handling plant (CHP) and stock yard
- Coal Transport and Loading system
- Overburden dumps
- Check/Garland drains
- Corporate social responsibility (CSR)
- Employees protection measures
- Water management structure (Effluent Treatment Plant/Sewage Treatment Plant)
- Greenbelt area and plantations

2.4 REVIEW OF STATUS OF STATUTORY COMPLIANCES

(a) Project approvals
(b) Environmental Impact Assessment
(c) **Health and Safety:** Regulations Nos. 6, 61, 106, 112 of Coal Mines Regulations, 1957 and its related DGMS Circulars;
(d) **Blast Monitoring**
(e) **Environment**
  (i) Water (Prevention and Control of Pollution) Act, 1974;
  (ii) Air (Prevention and Control of Pollution) Act, 1981;
  (iii) Environmental (Protection) Act, 1986 – approvals (EC, Hazardous Waste, BMW Authorizations)

(f) **Forest:** Forest (Conservation) Act, 1980.

(g) Environmental Management Strategy

1) Air Quality

i) Work zone –Standards for Coal Mines issued by MoEF, GSR-742 E dated 25.09.2000.

ii) Residential category – National Ambient Air Quality standards issued by CPCB, GSR 176 dated 02.04.1996- Air Quality Monitoring.

2) Noise Monitoring Plan – Noise Monitoring Programme

3) Water Quality

i) Water licence

ii) Mine discharge /Workshop/Colony effluents – Standards for Coal Mines issued by MoEF, GSR-742 E dated 25.09.2000 and GSR-801 (E), EPA, 1986, dated 31.12.1993- Water Quality Management.

iii) Ground Water – BIS 105000: 1991

iv) Surface Water – BIS 2296: 1982

2.5 WORKING GROUP MEETING & REPORTING

After the completion of interview, document verification and site visit; the observation and suggestions by the audit team were compiled into a consent checklist and audit notes were prepared. This report has been prepared highlighting areas where action or improvement is required keeping in view the scope of the study.

CHAPTER - 3
ENVIRONMENTAL AUDIT FOR SONEPUR-BAZARI OPEN CAST PROJECT

3.1 INTRODUCTION

Environmental audit is performed to assess the activities implemented by the project authority as per EC conditions and compliance as a set of criteria or standards recommended by the MoEF & CC, Govt. of India. The team conducted audit for Sonepur-Bazari OCP through exhaustive document review, site visit and interactions with the stakeholders. The status report on compliance to environmental clearance conditions submitted by the project authority to the respective regulatory agencies was also reviewed by the audit team for relevant input. Accordingly, a checklist of EC conditions by the MoEF & CC, status of environmental compliance and audit observation by the audit team prepared is provided in Table 3.1 and compliance status of EC condition for revised EC of amalgamated leases of Cluster-12 is provided at Table 3.1.

Table 3.1: Compliance to Environmental Conditions from production capacity of 27.16 MTPA (Normative) with a (Peak) production of 31.83 MTPA in a combined ML area of 13759.55 Ha.
and
Observations/Recommendations by ICFRE
(*vide* letter J-11015/76/2011-IA.II.(M) dated 9th February 2015)

A. SPECIFIC CONDITIONS

<table>
<tr><th>S. No.</th><th>Specific Conditions stipulated by MoEF & CC, Govt. of India</th><th>Project Proponent Compliance (till the end of March, 2017)</th><th>Observations/Recommendations by ICFRE</th></tr>
<tr><td>i.</td><td>Grant of EC is only for the non-forest area plus the forest area within the mining lease for which FC is available. No mining activities will be allowed in forest area for which FC is not available as per the following table:

<table><tr><th>S No.</th><th>Name of Mine</th><th>Forest Clearance Not available (Ha.)</th></tr><tr><td>1</td><td>Jhanjra UGP (Expansion)</td><td>99 Ha</td></tr><tr><td>2</td><td>Tilaboni UGP (Expansion)</td><td>64.8 Ha</td></tr><tr><td>3</td><td>Rangamati A UGP</td><td>91.0 Ha</td></tr><tr><td>4</td><td>Sonepur-Bazari OCP</td><td>32.65 Ha</td></tr><tr><td colspan="2">Total</td><td>287.45 Ha</td></tr></table></td><td>Stage-II Forest Clearance for 32.65 Ha Forest Land has been obtained by MoEF & CC vide reference No. 5-WBC063/2013-BHU dated 28th March, 2017.</td><td>Observed that mining in the forest land is not undertaken by the project authorities in Sonepur-Bazari OCP involving 32.65 Ha of Forest land in Quarrry-2 area and action is in progress to get its possession after felling of trees.
However, it is felt that delay in land transfer from Forest Department may cause mining constraint in achieving the target production in this block.</td></tr>
<tr><td>ii.</td><td>The maximum production from the mine at any given time shall not exceed the limit as prescribed in the</td><td>The maximum production from the mine at any given time will be under the limit as prescribed in the EC.</td><td>Verification of production data supplied by the Project Proponent (PP) does not indicate production exceeding EC limit.</td></tr>
</table>

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	EC.	Total production in the FY 2016-17 is 8.92 MT. Total Production in the year 2015-16 was 6.20 MT.	
iii.	The validity of the EC is for the life of the mine or as specified in the EIA Notification, 2006, whichever is earlier.	Noted and agreed.	This is agreed by the PP. Since there is no provision of renewal of ML granted under CBA (A&D) Act 1957, EC will remain valid for life of the mine.
iv.	All safety measures shall be taken as per CMR, 1957 & related Circulars.	Being complied with. All safety measures are being taken as per CMR, 1957 and related Circulars.	This is complied at Sonepur-Bazari OCP.
v.	The production shall be within the same Mining Lease area.	Being complied with. The production is within the same Mining Lease area.	Mining is being carried out in the demarcated lease hold area.
vi.	Coal shall be transported by rail only. Coal transportation from mine to siding should be by conveyor belt. The loading to siding by pay loaders into railway wagons.	Coal is transported by rail through Sitalpur and Dalurban Railway sidings. Pay loaders are used for loading into railway wagons. New Railway Siding with Silo loading system in our premises itself is under construction.	This condition is partially complied by the PP as transportation of coal to the siding is through open trucks and not by conveyor as stipulated. At siding, loading is by pay loaders on rakes.
vii.	Independent network of railway siding inside cluster be developed. Railway sidings should be constructed at the earliest and till then proponent may use mechanically covered trucks for transportation of coal.	A new railway siding with Silos Loading System is under construction at Sonepur-Bazari project. Necessary steps in this direction are being taken. Proposed date of completion is March 2018. Trucks are covered manually because mechanically covered trucks are not available in India.	Ground truth reveals that construction of railway siding is on full swing and likely to be completed by March, 2018. However, transport is still by open tippers and not by covered trucks as stipulated.
viii.	Three tier greenbelt shall be raised around the railway sidings and along	Three tier green belts will be raised around Railway siding after the completion of the	.No greenbelt/safety zone plantation has been undertaken by the PP within the mine lease all

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	the road sides to prevent dust and noise pollution.	same. Along road sides continuous plantation is being done. Recently 10 Hec. road-side plantation has been done in the FY 2015-16. 9.0 Ha. plantation is proposed to be done along NH 60 in the FY 2017-18.	along its boundary, around the railway sidings and along the road sides to prevent dust and noise pollution emanating from mining activities. Hence, the PP has to raise the thick greenbelt plantation by using plant species as suggested in **Annexure-V**.
ix.	Stowing and depillaring shall be as per the recommendations of the DGMS.	Not applicable, since the mine is an open cast project.	This condition is not related with Sonepur-Bazari OCP.
x.	The proponent must comply with the Raniganj Action Plan. The unstable areas within the cluster will be brought under plantation after the population residing over these areas is rehabilitated under the Master plan for Raniganj Coalfield to be implemented by ADDA.	Noted and agreed.	The condition is being complied by the PP in the cluster.
xi.	Trees with deep rooted system should be planted so as to prevent soil erosion.	Deep rooted local mixed species are being planted to prevent soil erosion. Plantation of *Vetiver sp.* (it has very deep roots) along with others species will be done in this monsoon season by IIT Kharagpur at OB dump of Sonepur- Bazari Project.	The condition is partially complied. The PP should raise native tree species which has deep root system such as *Acacia nilotica* (Babul), *Artocarpus heterophyllus* (Jack fruit), *Azadirachta indica* (Neem), *Ficus benghalensis* (Bargad), *Ficus racemosa* (Gular), *Ficus religiosa* (Pipal), *Haldina cordifolia* (Haldu), *Holoptelea integrifolia* (Papidi), *Lannea coromandelica* (Moin), *Mangifera indica* (Aam), *Syzygium cumini* (Jamun), *Tamarindus indica* (Imli), *Terminalia arjuna* (Arjun), etc. to prevent soil erosion, sliding of OB dumps and

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			protecting the unstable areas.
xii.	Proponent should plant additional 10 Ha/year over the next 10 years at various locations in the cluster.	Complied with. Additional 10 Ha road side plantation have been carried out in the FY 2015-16. 9.0 Ha. plantation is proposed for the FY 2017-18.	The compliance of the PP is not clear in the sense that the stipulated condition is for the plantation in additional 10 Ha/year over the next 10 years at the various locations in the cluster-12. If such is the case then the area at the end of the 10 years will be 100 Ha at the rate of 10 Ha/year for 10 years. Therefore, it is apprehended that the reported figure 181 Ha of land over the 3 years might be inclusive of all plantations in the cluster-12. It is advised that the PP should cross check the plantation figures and report accurately to this EC condition.
xiii.	River/Nallah shall be desilted and restored back to functional state.	Noted and agreed.	The condition is not complied. Two nallahs namely, *Tumni* and *Bonbahal* are located in the ML area of Sonepur-Bazari OCP. **Tumni Nallah:** It is passing towards northern side of the lease boundary and flowing from west to east and finally draining into the Ajay River. During the verification, it is noticed that the Nallah has been diverted along the northern side of lease boundary from its original path. The diverted Nallah bunds are eroded severely hence, the PP has to take necessary bio-engineering measures to protect the nallah banks from erosion. **Bonbahal Nallah:** It is originating from the ML area from southern side and flowing towards

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			South-Eastern direction and finally draining into Ajay River. The PP has to de-silt the Nallahs at periodical intervals before and after monsoon seasons in order to restore it back to the functional state.
xiv.	Wildlife conservation plan be prepared and submitted to the MoEF & CC with the approval of the State Govt.	Noted and agreed.	The condition is partially complied. The PP has informed that the report on the Wildlife Conservation Plan has been submitted to State Forest Department (SFD) for vetting. After clearance from the SFD, the report has to be submitted to the MoEF & CC.
xv.	Proponent shall use high resolution image of all clusters for evaluating land use, plantation etc.	Complied with. Satellite monitoring of Sonepur-Bazari Mine is done every year through CMPDIL.	This condition is being complied by the PP as stipulated.
xvi.	Separate drainage pattern be provided.	Not Applicable, since the mine is an open cast project.	The PP has to prepare the drainage pattern of the mine lease areas of cluster-12 and the same has to be submitted to MoEF & CC.
xvii	Sand stowing must be used as recommended by CMPDI.	Not Applicable, since the mine is an open cast project.	This condition is not related with Sonepur-Bazari OCP.
xviii	Action plan for prevention and mitigation of subsidence be prepared and implemented.	Not Applicable, since the mine is an open cast project.	This condition is not related with Sonepur-Bazari OCP.
xix	The OC patches to be operated will be completely filled-up after exhaustion of reserves and reclaimed with plantation.	OB is being concurrently backfilled into the decoaled areas. Plantation is also being done simultaneously as the dumping is completed. Total 702.43 Ha area has been excavated till March, 2017 out of which backfilling is being carried out in 375.0 Ha area.	The condition is being complied by the PP.

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		Plantation in 48.0 Ha area has been done on these backfilled dumps.	
xx	The OB shall be completely re-handled at the end of the mining.	Noted and Agreed.	The compliance of the PP is not correct. In view of high stripping ratio, it is apprehended that the OB dumps cannot be re-handled as these are being biologically stabilized. It is suggested that the PP should approach to the MoEF & CC to review the condition by providing facts and figures.
xxi	There shall be no residual OB dump after the mining.	Noted and Agreed.	The compliance of the PP is not correct. The PP has to approach the MoEF & CC and review the condition as the existing OB dumps are technically and biologically being reclaimed and stabilized and cannot be re-handled at the end of the mining.
xxii	After completion of mining activities, the subsided areas shall be graded and planted upon.	Not Applicable, since the mine is an open cast project.	This condition is not applicable to Sonepur-Bazari OCP.
xxiii	Coal extraction shall also be optimised in areas where agriculture production is continuing. Some pillars shall be left below the agriculture land. No depillaring and coal extraction should be carried out below habitation, HT lines and beneath roads, water bodies.	Not Applicable, since the mine is an open cast project.	This condition relates to underground mines and not for opencast, hence not applicable.
xxiv	Rehabilitation of the households falling within this cluster to be carried out in two phases within 10 years.	Phase-wise rehabilitation of the households is being carried out. Total 1221 Project Affected Families (PAFs) have been shifted till now.	The condition is being complied. Out of 15 villages, (4469 Project Affected Person's , PAP's), falling within the ML area of Sonepur-Bazari OCP, 9 villages (1219 PAP's)

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			have been rehabilitated and resettled. The team visited villages of PAPs as well as RR sites of Dahuka, Haripur, Sukanta Pally and interacted with the members of PAPs. Most of them expressed their satisfaction over compensation packages provided by the company.
xxv.	The land excavated after mining must be brought back to original condition for agricultural/plantation purpose.	Noted and Agreed.	The OB waste is being used for backfilling in the de-coaled area. The PP has agreed to bring back the backfilled areas for plantation and agriculture purpose after reclamation.
xxvi.	Water discharged from the mine should be as good as surface drinking water.	All the mine water is being used in the mine itself for industrial purposes. No water is being discharged outside from the mine.	Mine is working under zero discharge concept.
xxvii.	Final mine void 453 Ha and depth will not be more than 20-30 m. The void area will be converted into water body. The mine void should be used for pisciculture purpose.	Noted an Agreed.	This has to be complied by the PP at the end phase of mining activities.
xxviii.	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 shall be continued till movement ceases completely. In case of observation of any high rate of subsidence movement, appropriate effective corrective measures shall be	Not Applicable, since the mine is an open cast project.	Relates to underground mining project.

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<tr><td></td><td>taken to avoid loss of life and material. Cracks shall be effectively plugged with ballast and clayey soil/suitable material.</td><td></td><td></td></tr>
<tr><td>xxix.</td><td>If subsidence is found exceeding the permitted limits, then the landowners shall be adequately compensated with mutual agreement of the landowners.</td><td>Not Applicable, since the mine is an open cast project.</td><td>Relates to underground mining project.</td></tr>
<tr><td>xxx</td><td>Water sprinkling system shall be provided to check fugitive emissions from loading operations, conveyor system, haulage roads, transfer points, etc. Major approach roads shall be black topped and properly maintained.</td><td>Water sprinkling system has been provided to check fugitive emissions. Water sprinklers with mist formation have been provided at input hopper, transfer point and discharge chutes.
Major approach roads are black topped. Proper maintenance of roads is done regularly.
Water sprinkling on the roads is done with the help of mobile water sprinklers.</td><td>It is observed that the coal transportation route and coal stockyard do not have fixed water sprinkling system, only periodical sprinkling by mobile tankers are plying causing high fugitive dust emission. Roads are by and large maintained but in rainy season lot of slush is getting accumulated, this needs to be properly addressed. Black topping and maintenance of the roads should be undertaken on regular basis.</td></tr>
<tr><td>xxxi.</td><td>The CSR cost should be Rs 5 per Tonne of Coal produced which should be adjusted as per the annual inflation. Rs 1358 Lakh/annum shall be earmarked for holding medical camps from CSR fund.</td><td>CSR project is being implemented.
The CSR activities at Sonepur- Bazari OCP are done under following heads:
• Health Care
• Infrastructure
• Education Development
• Water Supply
Under Health care -Blood Donation Camps, Eye Camps & Medical service van to villagers for outdoor medical facilities. Black topped road has been constructed in Hansdiha Village. Essay and debate</td><td>The coal production details and corresponding CSR cost as per EC and expenditure for the financial year 2014-15, 2015-16 and 2016-17 at Sonepur-Bazari area is provided in the table below:
<table><tr><th>Financial year</th><th>Coal Production (in tonnes)</th><th>CSR Expenditure as per EC condition of Rs. 5 per Te*</th><th>Actual CSR Expenditure (Rs.)</th><th>Medical Expenditure, CSR (Rs)</th></tr><tr><td>2014-15</td><td>6406000</td><td>32030000</td><td>4400828</td><td>117657</td></tr><tr><td>2015-16</td><td>6202278</td><td>31011390</td><td>113639</td><td>51635</td></tr></table></td></tr>
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<tr><td></td><td></td><td>competition at Chinchuria Village to Promote Swachh Bharat Abhiyan.
A Project of Supply of Filtered Water to Nabagram Village under utilization of mine discharge water is proposed. Water of abandoned Bankola Mine will be treated and converted into drinking water.</td><td>
<table>
<tr><td>2016-17</td><td>8925012</td><td>44625060</td><td>3675583</td><td>29902</td></tr>
<tr><td>Grand Total</td><td>21533290</td><td>107666450</td><td>8190050</td><td>199194</td></tr>
</table>

It is evident from production data for the referred period that an amount of about Rs. 10 Crores can be accrued for CSR activities as per EC condition. However, data on expenditure shows that only about Rs. 82 Lakhs has been incurred on CSR activities, which is very less amount. Therefore, it is suggested that fund allocation for CSR activities should be reviewed for true compliance as stipulated in EC condition.

Field inspection of some of the CSR activities was carried out, which were found in consonance with the reporting and satisfactory. The visited CSR activities includes the following:
- Black topped road in New Hansdiha Village.
- Street lighting in Bhaluka Village.
- Construction of Pucca road from Khottadihi More to Chattisgonda.
- Primary health centre at Bhaluka Village rehabilitated site.</td></tr>
<tr><td>xxxii.</td><td>The mining in the existing mines should be phased out after expiry of the current mining lease and after</td><td>Noted and agreed.</td><td>The PP has agreed to comply the condition by implementing of restoration and reclamation of the mined out areas in the cluster-12 in a phased</td></tr>
</table>

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	reclamation of mined over area. The operating mines may be analyzed and monitored for compliance of conditions, bearing with movement of wildlife and until such time they are closed/phased out.		out manner.
xxxiii.	Everybody in the core area should be provided with mask for protection against fugitive dust emissions.	Being complied with. Dust masks have been provided to everybody in the core area.	Though project proponent has provided Personal Protective Equipment (PPE), however, PPE compliance among the workers is very poor, therefore, strict PPE compliance should be ensured by the PP.
xxxiv.	Dust mask to be provided to everyone working in the mining area.	Dust masks for protection against fugitive dust emissions have been provided to the personnel working in mining area.	
xxxv.	The supervisory staff should be held personally responsible for ensuring compulsory regarding wearing of dust mask in the core area.	Being complied with. The Mining Sardar and overman are personally responsible for ensuring compulsory regarding wearing of dust mask in the core area.	In case of non-compliance of PPE observed during operational time, if any worker is found without PPEs there is a system of issuing a warning lecture to the person concerned by safety department which has resulted in a better compliance of PPE.
xxxvi.	People working in the core area should be periodically tested for the lung diseases and the burden of cost on account of working in the coal mine area.	Complied with. Periodical Medical Examination (PME) of employees is being done regularly. Total 283 PME of company employees and 232 of contractual employees has been done in the FY 2016-17.	The central hospital at Kenda of Sonepur-Bazari mine site is equipped with Spirometry for occupational lung disease test. The records are well maintained, no severe case of Pneumocosis were noticed for the Sonepur-Bazari OCP. Further, it is suggested that all persons deployed in the mine (departmental as well as contractor) must be subjected to complete health check up periodically by National Institute of Miner's Health to ascertain ill effect of micro fine coal dust and carbonaceous gases emitted due to

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			spontaneous burning of coal in the mine and subsequent remedial measures. Further, it is suggested periodical health check up of HEMM operators should be undertaken by the PP to monitor the ill effects of vibration on the body of HEMM operators.
xxxvii.	The mining area should be surrounded by green belt having thick closed thick canopy of the tree cover.	Noted and agreed. Plantation in 7.5 meter strip all along the boundary of the lease boundary within the mine lease area will be done. Rs. 1,23,75,000.00 have been deposited in Ad-hoc CAMPA A/c for this purpose.	The condition has not been complied by the PP. The greenbelt plantation has to be raised in the safety zone area within the mine lease all along its boundary, which acts as a protective barrier to reduce the dust and noise emanating from mining activities. No greenbelt/safety zone plantation has been undertaken by the PP all along the lease boundary. Hence, the PP has to raise the thick greenbelt/safety zone plantation within the lease area with tall, fast growing including fruit bearing native plant species as suggested in **Annexure-V**.
xxxviii.	Besides carrying out regular periodic health check-up of their workers, 10% of the workers identified from workforce engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any, through an specialized agency /institution within the District/State and the results reported to this Ministry and to	Noted and agreed.	The PP should select workers to the tune of 10% as stipulated (Departmental as well as Contractual) to be sent to National Institute of Miner's Health for health check up as third party validation as stipulated.

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	DGMS.		
xxxix	The embankment constructed along the river boundary shall be of suitable dimensions and critical patches shall be strengthened by stone pitching on the river front side and stabilized with plantation so as to withstand the peak water flow and prevent mine inundation.	No river boundary nearby.	The condition is not applicable to the Sonepur-Bazari OCP as the Ajay river is about 4 km from the boundary of Sonepur- Bazari OCP. However, the Ajay river is bounded on the northern side of Cluster-12 of M/s. ECL. The mines of Cluster-12 which are on the boundary of the Ajay river has to implement the specified condition.
xl.	There shall be no overflow of OB into the river and into the agricultural fields and massive plantation of native species shall be taken up in the area between the river and the project.	Not Applicable. No river nearby.	No river is adjacent to the lease boundary. However, a seasonal Nallah (Tumni Nallah) has been observed on the northern side of Sonepur-Bazari OCP. Several rills and deep gullies are observed on the OB dump slopes. The PP has to take immediate action to protect the dump slopes by spreading geo-textile coir mat and simultaneous broadcasting of hydro-seeding of *Hamata* grass and other local herbaceous legume plant seeds on the slope of the OB dumps for protection from erosion of waste materials.
xli.	Catch drains and siltation ponds of appropriate size shall be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected shall be utilized for watering the mine area, roads, green belt development, etc. The drains shall be regularly desilted and maintained	Garland drain has been provided along the toe of external dump for collecting and discharging rain water from soil and OB dumps. Drain is being maintained properly and cleaning is being done regularly.	The condition is partially complied towards point numbers xli and xlii. Kutcha catch/garland drains are provided to protect the mine pit from the surface run-off water. At few places, kutcha garland drain has been made at the toe of the external OB dumps and is partially filled with silt and sediments. Kutcha catch/garland drains all along the haul

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	properly. Garland drains (size, gradient and length) and sump capacity shall be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity shall also provide adequate retention period to allow proper settling of silt material.		roads are made and are completely filled with OB boulders, silt and sediments. Catch drains are made all along the office road which is filled with silt and sediments. The PP has to strengthen the catch/garland drains and properly de-silt the drains before and during the monsoon season. Further, it is suggested to construct the catch/garland drains all along the toe of all the OB dumps which are to be connected to the Settling Tanks (ST) and finally drained into the mine sump. The mine sump water is initially allowed to pass through the ST followed by Silt Settling Pond (SSP), which is also acting as water recharge pond and thereafter the water in the SSP is used for industrial purpose. During the field visit, the SSP was found completely filled with aquatic weeds making it unusable for the purpose. It is suggested that the PP has to make it usable by removing all the weeds and other aquatic plants growing in it, strengthen the bunds all around and also de-silt periodically before and after monsoon.
xlii.	Garland drains (size, gradient and length) around the safety areas such as mine shaft and low lying areas and sump capacity shall be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine sites. Sump capacity shall also provide adequate retention period to allow proper settling of silt material.	Garland drain has been constructed keeping sufficient safety margin over and above the peak sudden rainfall with an average width of 3m and average depth of 1.5 to 2.5 m.	
xliii.	Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation shall be based on the rainfall data.	Proper benching in dumps is being done while maintaining slope stability to check run-off from OB dumps. Also regular plantation on OB dumps is carried out to stabilize the dumps and check run-off.	No retaining/toe-walls have been made at the bottom of both external and internal backfilling OB dumps. Hence, the PP has to construct retaining/toe walls at the bottom of both the external and internal backfilled OB dumps with proper catch/garland drains. The garland drains are to be connected to the mine sump after

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			passing through the settling tank, so that the silt and sediments can be settled in the mine sump.
xliv.	Crushers at the CHP of adequate capacity for the expansion project shall be operated with high efficiency bag filters, water sprinkling system shall be provided to check fugitive emissions from crushing operations, conveyor system, haulage roads, transfer points, etc.	Crushers at the CHP are operated with high crushing operations, conveyor system, haulage roads, transfer points, etc. Water sprinklers with mist formation have been installed at input hopper, transfer point and discharge Chutes.	Crushers are not fitted with any stack and there is no stack emission, therefore, bag filters are not fitted. However, conveyor transfer points and hopper points and discharge chutes are adequately provided with mist type of sprinkling system to check the fugitive emission.
xlv.	Mine discharge water outside the mining lease shall be monitored, particularly for TDS and treated to conform to prescribed levels before discharge into the natural environment.	There is zero discharge of water outside the mine lease. All the mine water is being used for industrial purposes. Sedimentation of mine water takes place in the mine sump where sufficient retention time for siltation process is given to set down properly. TDS level of mine water is within the prescribed level. Regular water quality testing is being done through CMPDIL RI-I.	There is no mine water discharge outside the mine. All mine water is used for industrial purpose. Sedimentation tanks have been provided which allows silt to settle and clear water is used for industrial spraying and other purposes.
xlvi.	Drills shall be wet operated.	Wet drilling is being carried out. Total population of drills with such arrangement is given below : Model 70E – 9 (nine) Nos., Model 650D – 4 (four) Nos., Dust guards are also provided in the drills.	This condition is complied.
xlvii.	The project authorities shall undertake regular repairing and tarring of roads used for mineral transportation. A 3-	Regular repairing and maintenance of roads is being done. Tree plantation along the approach roads is being carried out	Road maintenance is of lower order and it should be upgraded, especially coal transportation route.

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	tier green belt comprising of a mix of native species shall be developed all along the major approach roads.	regularly.	Continuous 3-tier greenbelt plantation has not been made along both sides of the approach/transport roads. However, a sparse plantation has been observed at few places on both sides of office road which include both exotic and native plant species. Hence, the PP has to raise thick plantation all along the transport/approach roads with the local plant species as suggested in **Annexure-V** to prevent the dust and noise pollution.
xlviii.	Controlled blasting shall be practiced with use of delay detonators and only during daytime. The mitigative measures for control of ground vibrations and to arrest the fly rocks and boulders shall be implemented.	Controlled blasting is done with help of delay detonators (using Nonel system). Blasting is done only in day time. The mitigative measures for control of ground vibrations and to arrest the fly rocks and boulders are being taken.	The drill holes are blasted using site mixed slurry (SMS) explosive brought in by bulker, the holes are charged and Nonel detonators are used with a delay of 17-42 milli second to reduce ground vibrations. Further, it was learnt that CMPDI is monitoring the ground level vibration with blast-mate.
xlix.	A Progressive afforestation plan shall be implemented covering an area of 6215.5 ha at the end of mining, which includes reclaimed external Ob dump area (404.74 Ha), internal dump area (1856.54 ha), and Green belt land (364.57 ha), and in township located outside the lease by planting native species in consultation with the local DFO/Agriculture Department. The density of the trees shall be around 2500 plants per ha. Massive plantation shall be carried out in open spaces in	Plantation is being done on reclaimed external dumps, internal dumps, in the plain land including CHP, along the approach roads, townships, etc., through Forest Department, Durgapur and West Bengal Wasteland Development Corporation Limited under the supervision of DFO Durgapur. Density of the trees is maintained at 2500 plants per Ha. Total plantation in 175.2 Ha has been done	The condition is being complied. Till date the PP has made plantation in an area of 175.2 Ha on the external and internal OB dumps; in the township area, along approach/ service roads, ecologically degraded barren/ wastelands within the lease areas. Progressive afforestation is to be carried out on the de-coaled backfilled internal OB dumps, external OB dumps and plantation all along the main approach/service roads (3 tier avenue plantation). The PP has not made any greenbelt/safety zone plantation all along the lease boundaries. Hence,

<table>
<tr><th>S. No.</th><th>Specific Conditions stipulated by MoEF & CC, Govt. of India</th><th>Project Proponent Compliance (till the end of March, 2017)</th><th>Observations/Recommendations by ICFRE</th></tr>
<tr><td></td><td>and around the mine and a 3-tier avenue plantation along the main approach roads to the mine.</td><td>till now. Details of which are given in the following table:<table><tr><th>S No.</th><th>Location</th><th>Plantation</th></tr><tr><td>1</td><td>External OB Dumps</td><td>51.0 Hec.</td></tr><tr><td>2</td><td>Internal OB Dumps</td><td>48.0 Hec</td></tr><tr><td>3</td><td>Plain Land (including CHP, along approach roads etc.)</td><td>76.2 Hec.</td></tr><tr><td colspan="2">Total</td><td>175.2 Hec</td></tr></table>Plantation in 34 Ha land on OB dumps along with 9.0 Ha roadside plantations will be done in FY 2017-18.</td><td>the PP has to raise greenbelt with fast growing tall native tree species including fruit bearing plants as suggested in Annexure-V.</td></tr>
<tr><td>l.</td><td>The proponent should prepare restoration and reclamation plan for the degraded area. The land be used in a productive and sustainable manner.</td><td>Being complied with.
Concurrent reclamation of the decoaled area is being carried out using the land in a sustainable manner.</td><td>Restoration and Reclamation plan for the degraded mine area prepared by the PP is not appropriate.
Hence, the PP has to prepare a detailed Restoration and Reclamation plan for implementation of the bio-engineering measures to bring back the mine degraded area for productive use.</td></tr>
<tr><td>li.</td><td>Compensatory Ecological and Restoration of waste land, other degraded land and OB dumps in lieu of breaking open the land be carried out.</td><td>Noted and agreed.</td><td>The condition is being implementing by the PP.
The PP has made ecological restoration of wastelands, degraded lands in the lease area and barren lands with both exotic and native plant species.
Reclamation of OB dumps is being carried out continuously with the advancement of the mine.
The future plantation activities are to be undertaken on the OB dumps and degraded</td></tr>
</table>

S. No.	Specific Conditions stipulated by MoEF & CC, Govt. of India	Project Proponent Compliance (till the end of March, 2017)	Observations/Recommendations by ICFRE
			lands after spreading the top soil by using native plant species as suggested in **Annexure-V.**
lii.	No groundwater shall be used for mining operations.	Being complied with. No ground water is used for mining operations.	No ground water is used for mining purpose. Mine sump water is effectively utilised for all mining operations
liii.	Quarry area is 2325 Ha. Backfilled quarry area of 1856 Ha shall be reclaimed with plantation by planting native plant species in consultation with the local DFO/Agriculture Department. The density of trees shall be around 2500 plants per ha.	Continuous back filling is being done in quarried area. Dumps are being finally reclaimed by planting native species through Forest Department and West Bengal Wasteland Development Corporation Limited under the supervision of DFO Durgapur. Density of the trees is kept 2500 plants per Ha. Plantation in 99.0 Ha area has been done so far OB Dumps.	The condition is being complied. The total excavated area of Sonepur- Bazari OCP is 660.99 Ha, out of which 341.7 Ha of backfilled area is technically reclaimed and 48 Ha of area has been afforested. At present, the PP is reclaiming and rehabilitating with both exotic and native plant species on the backfilled area OB dumps, external OB dumps and other waste lands within the lease area. The future plantation are to be undertaken on the backfilled OB dumps in the de-coaled quarry areas after spreading the top soil by using native plant species immediately as suggested in **Annexure-V.**
liv.	Regular monitoring of groundwater level and quality shall be carried out by establishing a network of existing wells and construction of new piezometers. The monitoring for quantity shall be done four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons and for	Regular monitoring of well water level and quality is carried out by CMPDIL. The results indicate good quality of ground water. All the data collected are being regularly submitted to the MoEF & CC and to the WBPCB with the half yearly compliance report.	At Sonepur-Bazari OCP area, there is no ground water quality station. The borewell monitored are of other mines of the Cluster-12. Only Mine water is monitored. Piezometers as suggested are not yet installed. Hence, it is suggested that few well falling in the mine periphery should be identified for quality check.

S. No.	Specific Conditions stipulated by MoEF & CC, Govt. of India	Project Proponent Compliance (till the end of March, 2017)	Observations/Recommendations by ICFRE
	quality in May. Data thus collected shall be submitted to the Ministry of Environment, Forests & Climate Change and to the Central Pollution Control Board quarterly within one month of monitoring.		
lv.	The Company shall put up artificial groundwater recharge measures for augmentation of groundwater resource in case monitoring indicates a decline in water table. The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.	Artificial recharge measures are not required since ground water level trends show an uptrend in 4 out of the 5 wells being monitored. Tanker water is provided to nearby needy villages on demand basis regularly. Financial help is also provided on opening of new wells, their maintenance and installation of hand pumps.	Mining activity always intersects ground water table and mine sump pumping and utilisation in industrial use always creates a negative water balance especially during summers. Therefore, it is suggested that possibility should be explored to create recharge structure by implementing roof top harvesting and creating lagoons outside the periphery of the mining pit.
lvi.	Sewage treatment plant shall be installed in the existing colony. ETP shall also be provided for workshop and CHP wastewater.	A Sewage Treatment Plant (STP) with capacity 600 cum/d is proposed at R.N. Colony of Sonepur- Bazari Project for an estimate of Rs. 2.85 Cr. An Effluent Treatment Plant (ETP) with capacity 7200 cum/d is proposed for workshop and CHP waste water. Approval of ETP design and layout for an estimate of Rs. 2.06 Cr. has been obtained from Headquarter ECL. Now the work is in tendering process.	Both the ETP and STP are non- existent. The oil and grease trap at workshop is defunct and is not in working condition and these should be expedited judiciously.
lvii.	Land oustees shall be compensated as per the norms laid out R&R Policy of CIL or the National R&R Policy or R&R Policy of the State Government	Complied with. Land oustees are being compensated as per the norms laid out under R&R Policy of CIL.	The condition is being complied. R & R Policy of M/s. CIL is being followed for resettlement and rehabilitation of PAFs in Sonepur-Bazari OCP**.**

S. No.	Specific Conditions stipulated by MoEF & CC, Govt. of India	Project Proponent Compliance (till the end of March, 2017)	Observations/Recommendations by ICFRE
	whichever is higher.		
lviii.	For monitoring land use pattern and for post mining land use, a time series of land use maps, based on satellite imagery (on a scale of 1: 5000) of the core zone and buffer zone, from the start of the project until end of mine life shall be prepared once in 3 years (for any one particular season which is consistent in the time series), and the report submitted to MoEF&CC and its concerned Regional office.	Complied with. Satellite monitoring of Sonepur- Bazari Mine is done every year through CMPDIL, Ranchi. Reports are being submitted to the MoEF and its Regional office and are also at the website of CMPDIL.	The condition is being complied by the PP.
lix.	A detailed Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment, Forest & Climate Change within 6 months of grant of Environmental Clearance.	Being Complied with.	After careful verification of the mine closure plan, it is revealed that the plan is inadequate, Hence, the PP has to prepare a detailed mine closure plan with site specific bio-engineering measures for reclamation and restoration of degraded areas and OB dumps and the same has to be submitted to MoEF & CC, Govt. of India, within 6 months.
lx.	The project authorities shall in consultation with the Panchayats of the local villages and administration identify socio-economic and welfare measures under CSR to be carried out over the balance life of the mine.	Socio-economic and other welfare measures under CSR are identified in consultation with the Panchayats of the local villages and administration. Socio-economic study of following 07 Tribal villages has been completed : i)) Arsola, ii) Kuchibeda, iii) Banghat iv) Bangapada v) Basakdanga	The condition is being complied. CSR activities have been carried out in consultation with members of local bodies and request letters received from local community. Baseline survey report and action plan has been prepared for implementation of socio-economic and welfare measures under CSR activities.

S. No.	Specific Conditions stipulated by MoEF & CC, Govt. of India	Project Proponent Compliance (till the end of March, 2017)	Observations/Recommendations by ICFRE
		vi) Nichu Basak Danga vii) Chatim Danga Socio-economic study of Sonepur Village has also been completed.	
lxi.	Corporate Environment Responsibility: a) The Company shall have a well laid down Environment Policy approved by the Board of Directors. b) The Environment Policy shall prescribe for standard operating process/procedures to bring into focus any infringements/ deviation /violation of the environmental or forest norms/conditions. c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions shall be furnished. d) To have proper checks and balances, the company shall have a well laid down system of reporting of non-compliances /violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.	Being Complied with. "Corporate Environmental Policy 2012" of Coal India Limited has already been formulated. "Corporate Environmental Policy 2012" of Coal India Limited has prescribed standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/condition. The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions has been furnished in "Corporate Environmental Policy 2012" of Coal India Limited. The company is having a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company.	a) Corporate Environmental Policy exists at M/s. Coal India Ltd. level and the same is being followed by M/s. ECL. b) No such process/procedures presently at vogue. c) A three tier hierarchical order was found at place. Environment Management Cell has been established at headquarter level by the Project Authority. It is observed that suitable qualified personnel have been recruited at junior level only and not at the level of the Senior Executive in the field of Environmental Management at the project area. The project authorities should take necessary steps to strengthen the Environment Management Cell with suitable qualified manpower at senior executive level in the project area for better execution of work related to environment protection and pollution control. d) Company has got a reporting mechanism of non compliance. All the units submitting monthly reports on compliance and non compliances at corporate level.

GENERAL CONDITIONS:

S. No.	General conditions stipulated by MoEF & CC, Govt. of India	Project proponent Compliance	Observations/ Recommendations by ICFRE
i.	No. change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment, Forest & Climate Change	Being strictly followed	This is complied by the PP.
ii.	No change in the calendar plan of production of quantum of mineral cost shall be made.	Being followed. Production of coal as well as OB is done as per the calendar plan.	No change in calendar plan of production and cost is made.
iii.	Four ambient air quality monitoring stations shall be established in the core s\zone as well as in the buffer zone for PM_{10}, $PM_{2.5}$, SO_2 and NO_x monitoring. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc carried out at least once in six months.	Ambient air quality monitoring is being done at cluster level. 14 (fourteen) ambient air quality monitoring stations have been established within cluster 12, after detailed study of the project area and local meteorology. Quarterly monitoring is carried out on the above stations regularly through CMPDIL.	The monitoring of air quality is being done at locations/stations in consultation with State Pollution Control Board (SPCB). Reports of these monitoring is submitted to the SPCB as specified. The reports are also submitted on six monthly bases to the Ministry of Environment, Forests & Climate Change) and this is also uploaded on the site of the company. These reports were examined by the audit team. The parameters monitored are SPM, RPM, SO_2 and NO_X as prescribed by Gazette Notification (GSR 742/E) dated - 25th September 2000. The said notification prescribes these parameters for monitoring stations laid within 500 m of the dust generating sources. However, CMPDI has carried out monitoring as per the parameters irrespective of their location *vis-a-vis* dust generating sources. The report specifies the location of the monitoring stations but do not specify the

S. No.	General conditions stipulated by MoEF & CC, Govt. of India	Project proponent Compliance	Observations/ Recommendations by ICFRE
			distances and the dust generating sources. The provisions of GSR 742/E dated - 25th September 2000 states that if any residential, commercial or industrial place falls within 500 m of any dust generating sources, National Ambient Air Quality Standard (NAAQS) standards will be applicable for monitoring. The monitoring at these stations should be carried out as per NAAQS. The standard prescribed by GSR 724/E have two values for each parameter, *viz.,* 24 hourly average and annual average. The reports give only 24 hourly values in periodical report. The annual report and annual averages values are provided. The values of parameters monitored vary over a narrow range. Even seasonal variations, due to change of wind directions are not reflected in the measured values. The analyses of 12 parameters prescribed *vide* gazette notification No.GSR 826(E) dated 16.11.2009 has been carried out. The EC prescribes that once in a year certain heavy metals like Hg, As, Ni, Cr, etc., are to be monitored. The same are also being monitored. The general guideline of MoEF & CC is that at least one station should be monitored on the upwind side of the wind direction and two stations on the downwind side. This is being

S. No.	General conditions stipulated by MoEF & CC, Govt. of India	Project proponent Compliance	Observations/ Recommendations by ICFRE
			followed by covering all the mines falling in cluster-12, and stations have remained constant throughout the year.
iv.	Data on ambient air quality (PM_{10}, $PM_{2.5}$, SO_2 and NO_X) and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring data shall be regularly submitted to the Ministry including its concerned Regional Office and to the State Pollution Control Board and the Central Pollution Control Board once in six months. Random verification Of samples through analysis from independent laboratories recognized under the EPA rules, 1986 shall be furnished as part of compliance report.	Ambient air quality monitoring for PM_{10}, $PM_{2.5,}$ SO2 and NOx and heavy metals such as Hg, As, Ni, Cd, Cr is being carried out on regular basis. Monitoring data are sent to the Ministry including its concerned Regional Office and to the State Pollution Control Board and the Central Pollution Control Board once in six months with six monthly EC Compliance.	This condition is complied by the PP. It is advised to the PP that random verification of samples through analysis be undertaken from independent laboratories recognized under EPA rules, 1986 and report should be furnished to MoEF & CC.
v.	Adequate measures shall be taken for control of noise levels below 85dBA in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with ear plugs/muffs.	Adequate measures are being taken for control of noise levels below 85 dBA in the work environment. • All HEMM and light vehicles are provided with silencers • Noise monitoring is being carried out regularly and found to be within permissible levels. • Workers exposed to high sound levels are provide with ear muffs and their working hours are reduced	The PP has undertaken several measures to control the noise pollution. The monitoring reports of noise monitoring do not show high noise values and are well within specified limit.

S. No.	General conditions stipulated by MoEF & CC, Govt. of India	Project proponent Compliance	Observations/ Recommendations by ICFRE
		to prevent long exposure time. • Periodical Medical Examinations (PME) of workers is also being carried out at 5 year intervals in which audiometric tests are carried out.	
vi.	Industrial Wastewater (workshop and wastewater from the mine) shall be properly collected, treated so as to conform to the standards prescribed under GSR 422(E) dated 19th May 1993 and 31st December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.	Sedimentation of mine water takes place in the mine sump where sufficient retention time for siltation process is given to set down properly. Construction of an ETP for treatment of waste water from workshop and CHP is under process. Oil and grease trap has been provided at workshop.	Mine water is effectively used for industrial purposes after due sedimentation through siltation ponds but waste water from HEMM washing are not treated properly. Oil and grease traps are defunct. Immediate attention should be paid to this facility.
vii.	Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transporting the minerals shall be covered with tarpaulins and optimally loaded.	Vehicles are tested for proper emission standards on routine basis and reports are being maintained.	This condition is by and large is complied, The PP is regularly checking the vehicular emission and records maintained. The HEMM are subject to maintenance as per the maintenance Schedule. However, trucks plying with coal to railway siding is not covered with tarpaulin and causing high spillages and fugitive emission**.** This should be addressed immediately.
viii.	Monitoring of environmental quality parameters shall be carried out through establishment of adequate number and type of pollution	Monitoring of environmental quality parameters is being done by RI-I, CMPDIL, who has well equipped laboratories with skilled manpower.	This condition is complied by the PP.

S. No.	General conditions stipulated by MoEF & CC, Govt. of India	Project proponent Compliance	Observations/ Recommendations by ICFRE
	monitoring and analysis equipment in consultation with the State Pollution Control Board and data got analyzed through a laboratory recognized under EPA rules, 1986	List of monitoring stations in cluster 12 is being attached as Annexure – I.	
ix.	Personnel working under dusty area shall wear protective respiratory devices and they shall also be provided with adequate training and information and information safety and health aspects.	Protective wears are being supplied and used by workmen judiciously. Adequate trainings and safety week programme are being provided to increase the awareness and to provide necessary information on safety. Occupational health surveillance i.e. Periodic Health Examination (PME) are being done as per norms at Central Hospital, Kalla.	The condition is being complied by the PP.
x.	Occupational health surveillance program of the workers shall be undertaken periodically to observe any contractions due to exposure to dust and to take corrective measures, if needed and records maintained thereof. The quality of environment due to outsourcing and the health and safety issues of the outsourced manpower should be addressed by the company while outsourcing.	Regular PME of employees, workers is done for any contractions due to exposure to dust and for other health related issues. PME of Contractual workers is also done. In the year 2016-17, PME of 232 contractual workers has been done.	The condition is being complied by the PP.
xi.	A separate environmental management cell with suitable qualified personnel shall be set up	Environment Management cell has been formed with Senior Executive of Mining Cadre- SOM, SBA, Senior Executive of	Environment Management Cell has been established at Head Quarters level by the Project Authority.

S. No.	General conditions stipulated by MoEF & CC, Govt. of India	Project proponent Compliance	Observations/ Recommendations by ICFRE
	under the control of a senior executive, who will report directly to the Head of the Company.	Civil Cadre- AE(Civil), SBA, Environmental Engineer- MT (Envt),SBA, Survey Officer- Area Survey Officer, SBA under General Manager SB Area in supervision of G.M. (Envt. & F) at E.C.L. Head Quarter.	It is observed that suitable qualified personnel have been recruited at junior level only and not at the level of the Senior Executive in the field of Environmental Management at the project area. Hence, it is suggested that the project authorities should take necessary steps to strengthen the Environment Management Cell with suitable qualified manpower with a background of Environment Management at senior executive level in the project area for better execution of works related to environment protection and pollution control.
xii.	The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose. Year-wise expenditure shall be reported to this Ministry and its Regional Office.	The funds earmarked for environmental protection measures are kept in separate account and are not diverted for other purpose.	Unit does not have any separate budgeting system for Environment Protection. The entire budget is centrally controlled and unit wise funds are allocated from central fund. Hence, it is suggested that the PP should allocate separate budget at the project and the same has to be utilized only for the purpose as defined. Accordingly, the year wise expenditure details to be submitted to MoEF & CC.
xiii.	The Project authorities shall advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular language of the locality concerned within seven days of the clearance letter informing that the project has been accorded	Complied with. It has been published in two local newspapers.	This condition is complied with by the PP.

S. No.	General conditions stipulated by MoEF & CC, Govt. of India	Project proponent Compliance	Observations/ Recommendations by ICFRE
	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 and Climate Change at http://envfor.nic.in.		
xiv.	A copy of the environmental clearance letter shall be marked to concern Panchayat/ Zila Parishad, Municipal Corporation or Urban local body and local NGO, if any, from whom any suggestions/representation has been received while processing the proposal. A copy of the clearance letter shall also be displayed on Company's website.	Copies were made available to Panchayats/local NGO etc. It is also made available at Area Office, Sonepur- Bazari and ECL Headquarters, Sanctoria.	This condition is complied with by the PP.
xv.	A copy of the environmental clearance letter shall also be displayed on the website of the concerned State Pollution Control Board. The EC letter shall also be displayed at the regional office, District Industry Sector and Collector's Office/Tehsildar's Office for 30 days.	Action taken by them.	This is not in purview of the PP.
xvi.	The clearance letter shall be uploaded on the Company's website.	Being complied. The clearance letter has been uploaded on	This condition is complied with.

S. No.	General conditions stipulated by MoEF & CC, Govt. of India	Project proponent Compliance	Observations/ Recommendations by ICFRE
	The compliance status of the stipulated environmental clearance conditions shall also be uploaded by the project authorities on their website and updated at least once every six months so as to bring the same in public domain. The monitoring data of the environmental quality parameters (air, water, noise & soil) and critical pollutant such as PM_{10}, $PM_{2.5}$, SO_2 and NO_X(ambient) and critical sectoral parameters shall also be displayed at the entrance of the project premises and mine office and in corporate office and on Company's website.	the company's website. The compliance status of the stipulated environmental clearance conditions is being regularly uploaded on the website.	
xvii.	The Project Proponent shall submit six monthly compliance reports on statue of compliance of the stipulated environmental clearance conditions (both in hard copy and in e- mail) to the respective Regional Office of the Ministry, respective Zonal Offices of CPCB and the SPCB.	Being complied. The six monthly compliance reports on status of compliance of the stipulated environmental clearance conditions is regularly being submitted (both in hard copy and in e-mail) to MoEF & CC, RO Bhubaneswar & WBPCB.	This condition is complied with.
xviii.	The Regional Office of the Ministry located in the Region shall monitor compliances of the stipulated conditions. The Project authorities shall extend full cooperation to the office(s) of the Regional Office by	Noted and agreed.	The PP has agreed to this condition.

S. No.	General conditions stipulated by MoEF & CC, Govt. of India	Project proponent Compliance	Observations/ Recommendations by ICFRE
	furnishing the requisite data/ information/ monitoring reports.		
xix.	The environmental statement for each financial year ending 31 march in form-V is mandated to be submitted by the project proponent for the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be uploaded on the Company's website along the status of the EC conditions and shall be sent to the respective Regional Offices of the MoEF & CC by e-mail.	Being complied. Environmental Statement for each financial year is being submitted regularly.	It is being complied by the PP.
6	The proponent shall abide by all the commitments and recommendations made in the EIA/EMP report so also during their presentation to the EAC.	The PP has not made any comment on the condition.	The PP should agree to this point and report accordingly.
7.	The commitment made by the proponent to the issue raised during Public Hearing shall be implemented by the proponent.	The PP has not made any comment on the condition.	The PP should demonstrate the implementation of the commitments for Public hearing on ground and report accordingly.
8	The proponent is required to obtain all necessary approvals that may be required before the start of the project.	The PP has not made any comment on the condition.	The PP should list out all the statutory approvals for reporting to the MoEF & CC.

S. No.	General conditions stipulated by MoEF & CC, Govt. of India	Project proponent Compliance	Observations/ Recommendations by ICFRE
9	The ministry or any other competent authority may stipulate any further condition for environmental protection.	The PP has not made any comment on the condition.	The PP should agree to this point.
10	The proponent shall set up an environment Audit cell with responsibility and accountability to ensure implantation of all the EC conditions.	The PP has not made any comment on the condition.	The PP has to establish a audit cell for implementation of EC condition which is not established at present in the cluster.
11	Concealing factual data or submission of falls/fabricated data and failure to compile with any of the conditions maintained above may result in withdrawal of this clearances and attract action under the provision of environment (Protection) Act 1986.	The PP has not made any comment on the condition.	The PP should agree to this condition.
12	The above conditions will be enforced inter-alia, under the provision of the Water (Prevention and Control of Pollution) Act 1974, The Air (Prevention and Control of Pollution) Act 1981, The Environment (Protection) Act 1986 and the Public Liability Insurance Act 1991 along with their amendments and rules and any other orders pass by Hon, le Supreme Court of India/High Courts and any	The PP has not made any comment on the condition.	The PP has obtained necessary approvals under Air and Water Acts, EP Act, but is ignorant about Public Liability Insurance Act and other Court orders. To facilitate the proponent the relevant clause of Public liability Insurance Act is enumerated as under: ***The Public Liability Insurance Act, 1991*** ***Obligation for Owners*** ➢ Provide relief in case of death or injury or damage to property from an accident on the principle of no fault.

S. No.	General conditions stipulated by MoEF & CC, Govt. of India	Project proponent Compliance	Observations/ Recommendations by ICFRE
	other court of law relating to subject matter. The proponent shall insured to undertake and provide for costs incurred for taking up remedial measures in case of soil contamination, contamination of ground water and surface water, and occupational and other diseases due to the mining operations.		➢ Draw insurance policies more than the paid – up capital* but less than Rs 50 Crores. ➢ Or for 1 Year Insurance Policy: 15 Crores. ➢ Pay additional amounts as contribution to the environment relief Fund. ➢ Provide any information required for ascertaining compliances with the provisions of the Act. ➢ Allow entry and inspection to ascertain compliance with the provisions of the Act. ➢ Pay the amount of an award as specified by the Collector. ➢ Comply with the directions issued in writing by the Central Government, direction may include i) ***Prohibition or regulations of handling of any hazardous substances or*** ii) ***Stoppage or regulation of the supply of electricity, water, or any other service.*** ****" Paid-up Capital" is the market value of all assets and stocks on the date of insurance.*** Further, Hon'ble Supreme Court of India's directives for the industries producing Hazardous Waste is also explained as under: **Hon'ble Supreme Court of India's order for Hazardous Industries (October, 2003).** **"---** ***all industries involved in the hazardous chemicals and generating hazardous wastes display on – line data outside the factory gate,***

S. No.	General conditions stipulated by MoEF & CC, Govt. of India	Project proponent Compliance	Observations/ Recommendations by ICFRE
			on quantity and nature of hazardous chemicals being used in the plant, as well as water and air emissions and solid wastes generated within factory premises. If such data is not made available, the unit should be asked to show cause or even be asked to close down". It is suggested that the PP should draw an action plan and implement with the condition.
13	Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under sec. 16 of National Green Tribunal, 2010.	The PP has not made any comment on the condition.	The PP should agree to this point.
14	The EC supersedes the earlier EC's obtained for the existing mines in the cluster.	The PP has not made any comment on the condition.	The PP should agree to this point.

Table 3.2: Compliance to Additional Environmental Conditions for the production capacity of 31.83 MTPA (Peak) in ML area of 12736 Ha.
and
Observations/Recommendations by ICFRE
(*vide* Letter No.J-11015/76/2011-IA.II (M) dated 3rd March, 2016)

Additional Specific Conditions

S. No.	Additional Specific Conditions stipulated by MoEF & CC, Govt. of India	Project Proponent Compliance (till the end of March, 2017)	Observations/ Recommendations by ICFRE
i.	The silo loading facilities at Jhanjra should be completed within three years and the production from Jhanjra should be enhanced to 5 MTPA only after the commissioning both of the new railway siding, and the silo loading facilities	The PP has not responded to this stipulation and not submitted the compliance to the MoEF & CC.	This condition is not related with Sonepur-Bazari OCP.
ii.	In view of the high levels of PM_{10} around the Basabdanga and some other villages, immediate steps should be taken to make water sprinkling arrangements and to provide an adequate and effective green belt around these villages so that the PM 10 levels are reduced	The PP has not responded to this stipulation and not submitted the compliance to the MoEF & CC.	Basabdanga area falls in the Buffer of Cluster-11. The main cause of high fugitive emission is due to high quantum of coal transport. The monitoring data from CMPDI was audited and it was found that during monsoon period there is reduction in PM_{10} concentration and post monsoon. The concentration of PM_{10} during summer is ranging between 105 and 110. It is recommended that proponent should increase the frequency of sprinkling all along the transport road. It is also advised that the PP has to raise thick

S. No.	Additional Specific Conditions stipulated by MoEF & CC, Govt. of India	Project Proponent Compliance (till the end of March, 2017)	Observations/ Recommendations by ICFRE
			greenbelt around this area.
iii.	After the period of six months from the date of issue of the amended EC, the PP shall report to the ministry the implementation status of the control measures mentioned at (ii) above, and the data on air quality as a result of the control measures taken till that time.	The PP has not responded to this stipulation and not submitted the compliance to the MoEF & CC.	Compliance report for this stipulation has not made available to audit team. Hence, no comment is made.

CHAPTER - 4
AUDIT FINDINGS

This chapter deals with the audit findings of compliance status of EC clearance to Sonepur-Bazari OCP. The ICFRE team has audited each and every point of EC Condition and provided comment on the Project Proponent's response to the compliance (Table - 3.1 & 3.2). In addition, following are the points under the areas identified for enhancing the environment performance of mine with adequate remedial measures.

4.1 MINING LEASE AND MINING

It has been observed that Sonepur-Bazari OCP has been granted "Mining lease" under Mines and Mineral (Development and Regulation) Act, 1957. A circular issued by Ministry of Coal *vide* No.43024/1/2004 PRIW dated 2nd September, 2004 states that under in para 2:

"On acquisition of land and its rights under section 9(1) of CBA (A&D) Act, the same is vested in the Central Govt. free from all encumbrances as per section 10(1) of the said Act. Therefore, state Govt. is diverted of all the rights over such land. Hence, granting of lease by the state government is not required".

Mines and Mineral (Development and Regulation) Act, 1957 has been amended in January 2015. Section-4 of the amended MMDR act stipulates that no prospecting or mining of any mineral shall be under taken without a grant of prospecting license/mining lease.

- Thus all mining operations carried out without grant of mining lease becomes illegal. The company requires to get this issue legally examined and all the mining companies must have mining lease granted by the State Government that include the Sonepur-Bazari OCP.
- Five villages namely Sonepur, Bhatmura, Madhudanga, Nabagram and Shankarpur are within the lease area which is yet to be rehabilitated. These villages are blocking 1.97, 3.36, 4.60, 6.02 and 1.15 MTe of coal respectively for mining. Further 7.12 MTe of coal is getting blocked in the forest area. This blockage is a mining constraint. It is advised that villages should be rehabilitated on top priority and forest land should be taken up for possession as Stage-II clearance is available with the PP. Even after commissioning of HMB-13 and HMB-14, both these draglines have not performed well with overall availability not exceeding 60%.
- Coal extraction and its management along with fire (spontaneous heating) incident management was found satisfactory as the spontaneous heating (fire) of coal was not observed at the quarry.

4.2 HEALTH

All the persons deployed in the mine (Departmental as well as Contractor) may be subjected to complete health check-up periodically by National Institute of Miner's Health to ascertain ill effects of micro-fine coal dust and carbonaceous gases emitted due to spontaneous heating (burning) of coal in the mine.

4.3 COAL TRANSPORTATION

It is observed that coal is transported to Sitalpur and Dalurband Railway siding in open trucks without cover. There is lot of spillages of coal while transportation, this is the main cause of high PM_{10} concentration in the area. One such station at Basabdanga towards Sitalpur railway siding is showing very high concentration of PM_{10}. This is attributable to heavy vehicular traffic and improper dust suppression system. This need higher level of road maintenance and emission control by effective sprinkling system.

- Greenbelt should be raised all along coal stockpile yard and also at siding to arrest fugitive emission. Trucks should be covered with tarpaulin and overloading should be avoided.
- The haul roads are being maintained reasonably well. Dust suppression is being carried out with tankers. Haul roads, with a reasonably long life should be equipped with fixed water sprinklers on both sides.

4.4 LAND AND SURFACE WATER MANAGEMENT

The area has received an annual average rainfall ranging from 1134 to 1547 mm during the period from 2012-16 (IMD) and it indicates that the area is highly prone to erosion. Together with open cast mining, which is essentially a highly destructive kind as far as soil and water conservation is concerned; heavy rainfall in the area is expected to cause much devastation to the soil profile and surface water runoff. Hence, strict erosion control measures such as adequate and effective protection to the external OB dumps, internal back filled areas, barren lands and improperly levelled mine pits, transport/haul roads, stock yards, etc., should be taken to protect the soil and surface water.

Mine sump Water

The mine runoff water is initially allowed to settle in the mine sump and then pumped out into the Settling Tank (ST) and thereafter, pumped into Silt Settling Pond (SSP) which is located near CHP/Coal Stockyard. The mine sump water is being mainly used for dust suppression, watering the plantations, washing, etc. There is no direct discharge of sump water to the natural water courses outside the lease area.

Catch/Garland drains

In the ML area, kutcha garland drains are provided to protect the mine pit from the surface runoff water. At few places, kutcha garland drain has been made at the toe of the external OB dumps and is partially filled with silt and sediments. Kutcha catch/garland drains all along the haul roads are made and are completely filled with OB boulders, silt and sediments. Catch drains are made all along the Office road and is filled with silt and sediments. The PP has to strengthen the catch/garland drains and properly de-silt the drain before and during the monsoon season. Further, it is suggested to construct the catch/garland drains all along the toe of all the OB dumps and is to be connected to the ST and finally drained into the mine sump.

Silt Settling Ponds

The mine sump water is initially allowed to pass through the ST followed by SSP, which is also acting as water recharge pond and thereafter the water in the SSP is used for industrial purpose. During the field visit, the SSP was found completely filled with aquatic weeds making it unusable for the purpose. It is suggested that the PP has to make it usable by removing all the weeds and other aquatic plants growing in it, strengthen the bunds all around and also de-silt periodically before and after monsoon.

Nallahs

Two Nallahs namely, *Tumni* and *Bonbahal* are located in the ML area.

(i) Tumni Nallah is passing towards northern side of the lease boundary and flowing from west to east and finally draining into the Ajay River. During the verification, it is noticed that the nallah has been diverted along the northern side of lease boundary from its original path. The diverted nallah bunds are eroded severely; hence the PP has to take necessary bio-engineering measures to protect the Nallah banks from erosion.

(ii) Bonbahal Nallah is originating from the ML area from southern side and flowing towards South Eastern direction and finally draining into Ajay River.

4.5 DUMP MANAGEMENT

It is noticed that in the lease area, OB dumping is being done from the top to bottom. This practice may not be sustainable for proper stabilization and management of OB dumps, which may lead to collapse of OB waste materials along with boulders into the Nallahs/streams/forest/roads.

As per the physical features of the terrain, dumping should be carried out by adopting retreating method starting from bottom and reaching to the top by creating terraces of 20 m height and 15 m width and the overall slope of the OB dump should not exceed 28 degrees. Berms should be provided at the toe of each terrace to avoid water flow over the dump slopes. Wherever

necessary, retaining/toe walls and garland drains should be provided on every terrace and the drains have to be connected to the vertical drains and finally the water has to be drained into the mine sump for proper settlement. After completion of each terrace (bottom to top), plantation has to be carried out immediately using the plant species suggested in **Annexure-V**.

As per the surface plan and physical verification of the ML area, it was noticed seven external OB dumps and four internal backfilled OB dumps. Most of the internal OB dumps are in continuity with the external OB dumps separated by mine haul roads.

External OB Dumps

(1) External OB Dump-A 4

It is an inactive external OB dump. The dump is located in an area 40.74 Ha, towards western side of the ML area. The height of the dump is about 55 m and its slope angle is about 40-45 degrees and having about 2-3 terraces. The dump has been biologically stabilized by planting both exotic and native plant species. At few places, rills and gullies are noticed on the dump slopes. No retaining wall/garland drains are provided to protect the OB dump from erosion.

(2) External OB Dump-B

It is located in an area of 25.37 Ha, towards southern side of quarry-2D. The dump height is 50 m and slope angle is about 45 degrees. There are 2 terraces observed on the dump. The top terrace is biologically stabilized with grasses and sparse plantation of trees, while the bottom terrace has not been stabilized biologically. No retaining wall/garland drains are provided to protect the OB dump from erosion. The PP has to stabilize the dump slopes immediately.

(3) External OB Dump-G

It is an active dump and located in an area of 11.46 Ha, towards north of Quarry 2D. The dump has 3 terraces and its height is 25 to 30 m and its slope angle is about 45 to 50 degrees. Small rills and gullies are observed on the dump slopes at several places**.** Bio-engineering measures such as retaining/toe walls together with plantation have not been implemented. The PP has to make suitable engineering measures such as retaining/ toe wall and garland drains. The PP also should make gully plugs on the dump slopes wherever gullies/rills are formed. Biologically, the dump has to be stabilized by planting suitable native plant species including fast growing and fruit bearing tree species.

(4) External OB Dump-C

It is an active dump and is located in an area 85 Ha, towards northern side of Quarry 2A. There are 3-5 terraces made on this dump. Its height is about 50 m and slope angle is about 45 degrees. Sparse vegetation with natural grasses like *Saccharum* spp. has been observed on the dump

slopes. At some places, the dump slope is severely eroded, formed deep rills and gullies and breeched. No bio-engineering measures have been made.

(5) External OB Dump-D

It is an inactive dump and is located in an area of 21.18 Ha towards north of Quarry-3. There are 3-4 terraces have been observed on the dump. Its height is about 25 m and an average slope angle of about 35 degrees. At some places, the dump slope is severely eroded. No retaining wall/garland drains are noticed at the bottom of the dump. No bio-engineering measures have been made. The PP informed that some part of the dump is under process of re-handling for the safety of the mine pit Quarry-3 as the mine benches towards northern side had severely collapsed into the pit.

(6) External OB Dump-E

It is an inactive dump and is located in an area 46.71 Ha, towards northern side of Quarry-3. A total of 3-5 terraces have been observed on the dump and its overall height is about 30 to 40 m and slope angle is about 40 to 45 degrees. Sparse natural vegetation is observed on dump slopes. At some places, the dump slope is severely eroded and deep rills and gullies are observed. No bio-engineering measures have been made. The PP informed that some part of the dump is under process of re-handling for the safety of the mine pit Quarry-3.

(7) External OB Dump – A 5

It is an encroached inactive dump located in an area of 44.29 Ha outside the ML area towards western side. Its overall height is about 60 to 70 m and slope angle is about 35 to 40 degrees. No retaining wall/ garland drains are provided at the bottom of the OB dump. The dump has been biologically stabilized with grasses and shrubs together with exotic and native plant species **(Photo-11)**.

Internal Backfilling OB Dump

There are four internal backfilled OB dump areas noticed in the de-coaled area. No retention/toe wall and garland drains are observed at the bottom of these dumps. Hence, the PP has to construct retention/toe wall and garland drain at the bottom of these dumps and it has to be connected to the mine sump after passing through the settling tank.

(1) Internal Backfilled Dump – A 1

It is located in an area of 34.0 Ha western side of ML almost in between OB dumps A-4 and A-5 and is having 2 terraces. Its height is about 30 to 40 m and slope angle is about 40 degrees. The dump is vegetated only at some part towards eastern side nearer to view point. Towards western side, the dump is completely devoid of any vegetation and not stabilized.

(2) Internal Backfilled Dump – A 2

It is an active area located in an area of 168 Ha towards south of Quarry-1A and is having 6-7 terraces. Its height is about 70-80 m from the present bottom of the pit and slope angle is about 30-35 degrees.

(3) Internal Backfilled Dump – A 3

It is located south of Quarry-3 and external Dump-D in an area of 23 Ha and is having 2-3 terraces. The height of the dump is about 45 m and its slope angle is about 40 degrees. At some places, deep rills and gullies have been observed on the dump slopes. As per the PP, some part of the dump is under process of re-handling for the safety of the mine pit.

(4) Internal Backfilled Dump – A 6

It is an active internal dump located in an area of 8.5 Ha in north of Quarry 2A. Its height is about 35 to 40 m and slope angle is about 40 to 50 degrees and is having 3-4 terraces. No bio-engineering measures have been made in order to protect the dump.

Retaining/Toe walls

No retaining/toe-walls have been made at the bottom of both external and internal backfilling OB dumps. Hence, the PP has to construct retaining/toe walls at the bottom of both the external and internal backfilled OB dumps with proper catch/garland drains. The garland drains are to be connected to the mine sump after passing through the settling tank, so that the silt and sediments can be settled in the mine sump.

Top soil management

Top soil contains rich organic nutrients and dormant seeds of the plant species. It is very essential to conserve the top soil in an earmarked area for spreading on the technically reclaimed areas. The PP has not so far preserved and maintained the top soil separately in the ML area. However, it has been observed that some of the OB dump tops are covered/ spread with top soil. Hence, it is suggested that the PP has to preserve the top soil in the predetermined area in future and has to spread on the inactive OB dumps before onset of monsoon after completion of technical reclamation, so that the dormant seeds, grass rhizomes, other herbs and shrubs can regenerate and stabilize the OB dumps.

4.6 SAFETY ZONE/GREENBELT/AVENUE PLANTATION

The greenbelt plantation has to be raised in safety zone area within the mine lease all along its boundary, which acts as a protective barrier to reduce the dust and noise emanating from mining activities. No greenbelt/safety zone plantation has been undertaken by the PP all along the lease boundary, along the roads and around the railway sidings. Hence, the PP has to raise the thick

greenbelt/safety zone plantation within the lease area with tall, fast growing including fruit bearing native plant species as suggested in **Annexure-V.**

Boundary pillars

No boundary pillars are made all around the lease area. Hence, the perpetual lease area under possession needs to be demarcated by boundary pillars.

4.7 PLANTATIONS

4.7.1 Transport/Service Roads

Continuous avenue plantation has not been made along both sides of the service/transport roads. However, a sparse plantation has been observed at few places on both sides of office road which include both exotic and native plant species such as *Acacia auriculiformis, Albizia odoratissima, Alstonia scholaris, Azadirachta indica, Bauhinia purpurea, Cassia fistula, Cassia siamea, Ceiba pentandra, Dalbergia sissoo, Delonix regia, Eucalyptus* spp., *Gmelina arborea, Lagerstroemia speciosa*, *Holoptelea integrifolia, Lannea coromandelica, Leucaena leucocephala, Neolamarckia cadamba, Peltophorum pterocarpum, Polyalthia longifolia, Pongamia pinnata, Syzygium cumini,* and *Terminalia arjuna.* Hence, the PP has to raise the thick plantation all along the transport/service roads.

4.7.2 Plantations on degraded waste lands and in township

Plantation has been raised on degraded waste lands and in the township area with both exotic and native plant species like *Acacia auriculiformis, Albizia lebbeck, Albizia procera, Ailanthus excelsa, Aegle marmelos, Alstonia scholaris, Annona squamosa, Artocarpus heterophyllus, Azadirachta indica, Bauhinia purpurea, Bauhinia variegata, Bougainvillea spectabilis, Callistemon viminalis, Cascabela thevetia, Cassia fistula, Cassia siamea, Dalbergia sissoo, Delonix regia, Eucalyptus* spp., *Ficus benghalensis, F. religiosa, Gliricidia sepium, Gmelina arborea, Holoptelea integrifolia, Lannea coromandelica, Leucaena leucocephala, Mangifera indica, Melia azedarach, Murraya paniculata, Nerium odorum, Neolamarckia cadamba, Peltophorum pterocarpum, Plumeria rubra, Polyalthia longifolia, Pongamia pinnata, Psidium guajava, Roystonea regia, Samanea saman*, *Syzygium cumini, Tamarindus indica, Tectona grandis*, *Terminalia arjuna, Thuja occidentalis, Trema orientalis, Vitex negundo, Zizyphus mauritiana*, etc.

4.7.3 External and internal eastern backfilled OB dump Plantation species

Majority of the external OB dumps and internal backfilled OB dumps are not biologically reclaimed and rehabilitated as described in dump management section. The plantations are made with both exotic and native species like, *Acacia auriculaeformis, Ailanthus excelsa, Albizia lebbeck, Alstonia scholaris, Azadirachta indica, Bombax ceiba, Cassia siamea, Dalbergia sisoo,*

Eucalyptus sp,. *Gmelina arborea, Haldina cordifolia, Holoptelea integrifolia, Lannea coromandelica, Leucaena leucocephala, Neolamarckia cadamba, Peltohorum pterocarpum, Phyllanthus emblica, Pongamia pinnata, Prosopis juliflora, Syzygium cumini, Tectona grandis, Ziziphus mauritiana,* etc.

4.7.4 Railway siding

On the way to Sitalpur railway siding, no greenbelt or plantation has been observed on both sides of the approach roads and around the railway siding**.** Hence, the PP has to create a thick 3-tier greenbelt plantation using local tall, fast growing, fruit bearing tree species all along the approach roads as well as all around the railway siding in order to control the dust and noise on the surrounding environment.

All the future afforestation/plantation activities on the backfilled OB dumps, on the external OB dumps, degraded areas, township, railway sidings, transport/ service roads are to be undertaken by using only native plant species as suggested in Annexure-V.

4.8 ENVIRONMENT MANAGEMENT PLAN AND MONITORING

Monitoring of pollution through related environmental parameters is an essential requirement of EC granted by MoEF & CC. The project has been regularly carrying out such monitoring as under:

i. Ambient air quality
ii. Water and effluent quality
iii. Noise levels

The above monitoring is carried out by laboratory of Central Mine Planning and Design Institute Ltd. (CMPDIL) which is approved by MoEF&CC.

4.8.1 Monitoring of Air Quality

The monitoring of air quality is done at locations/stations decided in consultation with State Pollution Control Board. Reports of these monitoring is submitted to the State Pollution Control Board as specified and also submitted on six monthly basis to the Ministry of Environment, Forests & Climate Change. The reports are also uploaded on the site of the company.

The examination of the reports revealed that: The analyses of 12 parameters prescribed *vide* gazette notification No.-GSR 826(E) dated- 16.11.2009 has been carried out.

The parameter monitored are SPM, RPM, SO_2 and NOx as prescribed by (GSR 742/E) dated- 25th September, 2000. The said notification prescribes that these parameters for monitoring stations should be laid within 500 m of the dust generating sources. The monitoring agency, CMPDI has carried out monitoring for the parameters, in accordance with notification.

There are 12 fixed Air Sampling locations for entire Cluster -12, but no sampling point exists for Sonepur-Bazari. Only one station was shown in Environment monitoring plan at Basabdanga which happens to be buffer zone of Cluster-11. Therefore, it is advised that at least two or three stations should be selected for Sonepur-Bazari OCP for monitoring as the lease is largest OCP in this cluster. Further, it is advised that the monitoring report of Basabdanga be included in the monitoring report of Cluster-12.

The guideline of MoEF & CC states that at least one station should be monitored on the upwind side of the wind direction and two stations on the downwind side. This guideline has been followed for the cluster. Sampling and the reported stations remained constant throughout the year.

The EC prescribes that once in a year certain heavy metals like Hg, As, Ni, Cr etc. are to be monitored. The same has been monitored.

There is a mechanism for monitoring of fugitive emission and irrespirable dust particle. The PP should increase the frequency of water sprinkling for arresting of fugitive emissions, especially on coal transportation road. Proponent should install fixed water sprinklers all along coal transportation road. Coal transporting tippers should move through Instant Shower System. It is suggested that the monitoring should be carried only at such station which are approved in EIA/EMP and there should not be any deviation.

4.8.2 Noise measurement

Monitoring Reports of Sonepur-Bazari OCP were audited. It reveals that stations where monitoring has been carried out are well within specified limit. Noise levels are not monitored on the roads, within lease or outside the lease area, which carry coal to the receiving pits. It may be interesting to note that certain states like Karnataka, Maharastra do not allow trucks carrying mineral on any roads within 500 m of villages/Resettlements.

4.8.3 Monitoring of traffic

The guidelines for preparation of EIA/EMP need carrying out a traffic survey on the roads where the traffic of mineral enters the public road. Although EC does not prescribe such a survey, it is desirable to carry out such a survey, when the production of mine increases from existing level to higher level. This is particularly relevant in case of Sonepur-Bazari OCP as its production has increased at least two times from a production level of 8.925 MTY.

4.8.4 Monitoring of soil

Monitoring of soil is done as baseline data while preparing the EIA/EMP. The EC does not prescribe soil sampling during working of the mine. However, since the top soil is removed and is placed at several places as small heaps, which is against the statement in EIA/EMP and MoEF & CC condition; for good environmental practice, the top soil has to be stacked at an earmarked area to be used for reclamation of degraded areas and plantation.

4.8.5 Environment Management

The project authority has established Environment Cell in the Project having junior level executive qualified in Environment Management, but suitable qualified personnel at senior executive in the field of Environmental Management is not present. All senior executives are from mining or from allied discipline through lateral appointed so far. Hence, the project authorities should take necessary steps to strengthen the Environment Management Cell.

It is observed that the project authority has not earmarked a separate budget for environment protection measures. Hence, it is suggested that the same should be implemented at the earliest. Accordingly, the year wise expenditure details to be submitted to MoEF & CC, Govt. of India.

4.9 GENERAL RECOMMENDATIONS

1. Mine operations in all the sections of Sector-I and Sector-II are carried out extremely haphazardly. However, Sector-II is slightly better than Sector-I. Rather than an active (production) mine, it appears to be an abandoned mine.
2. Section-22(3) of Mines Act, 1952 was imposed by DGMS *vide* letter dated 20-01-2017 due to extremely dangerous working conditions at Sector-III (Quarry No. 3) such as:
   a) Very high benches (59 m to 65 m) for a horizontal length of 950 m.
   b) Sliding/collapse of the sides and heavy cracks at the floor of the coal seam.
   c) OB dump on eastern direction and on northern direction are very close to the edge of the quarry.

   During field visit, it was observed that no action is taken to rectify the violations for withdrawal of Section-22(3), although six months have already passed since then.
3. Waste excavation is very much lagging against the stripping ratio envisaged in PR (October 2011). Since dragline is under breakdown for the last one year (June 2016), availability of de-coaled area is highly restricted. It has also affected systematic operations in Sector-I.
4. Bench height and width in OB (both departmental and outsourced patch) is not maintained as planned by the project. Bench height is much more than prescribed limit and width is narrow, not suitable for two way traffic. Situation is worst in Sector-A where many contractors are engaged along with departmental operations.

5. It is suggested that some sections (patches) may be shutdown especially in Section-I for proper development of mine benches and haul roads.
6. Road surface of bench roads, haul roads in the mine and ramps/approach roads is quite rough and bumpy/undulating (may be due to heavy rains in last one week) and needs proper grading.
7. Haul roads management needs systematic improvement as at many places one way traffic system for dumpers/dump trucks engaged for OB removal and coal transportation is quite inadequate. There should be separate (service) road for light and heavy vehicles including U-turns.
8. Hazardous waste (spent oil) is stored without proper signage and transported to underground mines of ECL without the consent of SPCB. This practice should be legalized by taking proper consent/Authorization from State Pollution Control Board. Public Liability Insurance Policy should be taken across ECL to comply with the condition as laid in EC letter.
9. The mine sump water is pumped in ETP along with CHP, both the water is treated and clear water is reused and zero discharge is maintained. The HEMM washing facility with oil and grease traps is not at all satisfactory and it is observed that the system is not functioning for quite some time. This should be immediately attended and rectified.
10. It is observed that enormous amount of fresh potable drinking water is getting drained from the residential areas where it is observed in number of blocks, the foot valves are faulty and water is draining out. This should be rectified immediately to prevent the loss of water due to the faulty foot valves.
11. Water cess filed by proponent is calculated based on pump running hours. This is a faulty practice. It is advised to install flow meters at intake points and returns to be filed based on flow meter readings.
12. No greenbelt has been made all around the mine lease area, all along the approach roads to the railway siding. The PP has to raise greenbelt around within the lease boundary immediately.
13. At some places, Kutcha catch/garland drains are made at the toe of the external OB dumps, which are partially filled with silt and sediments. The PP has to construct the catch/garland drains all along toe of the OB dumps and they are to be connected to the Settling Tanks (STs) and finally drained into the mine sump. The drains are to be regularly de-silted before and during the monsoon season.
14. The ST/ SSP pond near CHP/ CSY is fully covered with aquatic weedy species. The PP has to de-silt the ST/SSP periodically before and during monsoon season and also remove all the aquatic weeds and other plants for better management.
15. During the inspection, it has been observed that the trucks carrying coal are not covered with tarpaulin. Hence, the PP should strictly ensure to cover loaded trucks with tarpaulin.

16. Proper drainage facility has not been made all along the haul and approach roads. The PP has to make proper drainage facility all along the haul and approach roads.
17. Dust suppression is very poor in mine haul roads, approach roads and railway siding area. Hence, the PP should take necessary steps for controlling dust pollution.
18. Continuous avenue plantation has not been made along both sides of the service/transport roads. However, a sparse plantation has been made on both sides of office road which include both exotic and native plant species. The PP has to create a continuous thick avenue plantation by using tall, fast growing and fruit bearing local tree species.
19. Berms should be provided at the toe of each terrace to avoid water flow over the dump slopes. Wherever necessary, retaining/toe walls and garland drains should be provided on every terrace and the drains have to be connected to the vertical drains and finally the water has to be drained into the mine sump for proper settlement.
20. Few of the external OB dump slopes are severely eroded and noticed several rills and gullies on the slopes. Therefore, the shortfalls in waste dump management are to be addressed immediately by making a series of gully plugs/log wood check dams/brush wood check dams, so that the erosion of sediments and loose waste boulders from the OB dumps can be arrested.
21. The PP has to take appropriate action to make proper terracing and cover with geo-textile coir mat at vulnerable areas followed by broad casting of seeds of local grasses and legumes for proper stabilization of dump slopes.
22. Retaining/toe walls and garland drains are not made at the toe of the OB dumps. Hence, the proponent has to construct the retaining/toe wall and garland drain at the bottom of the OB dumps immediately.
23. No top soil has been preserved and maintained in the ML area. Hence, the PP has to preserve the top soil in the predetermined area. The top soil has to be spread before onset of monsoon on the inactive OB dumps after attaining the specified height, so that the dormant seeds, grass rhizomes and other herbs and shrubs can regenerate and stabilize the OB dumps.
24. No boundary pillars are made all around the lease area. Hence, the perpetual lease area under possession needs to be demarcated by boundary pillars.
25. Gap plantation should be undertaken wherever possible in the township area, wastelands, OB dumps and other degraded areas.
26. It is observed that CSR fund corpus is being made based on CSR Policy of CIL i.e. 2% of average net profit of the company for the 03 preceding financial years. However, the EC condition for Sonepur-Bazari OCP states that CSR cost should be Rs 5 per tones of Coal produced which should be adjusted as per the annual inflation. In the case of Sonepur-Bazari, fund allocation for CSR activity for the referred period is only about Rs. 82 Lakhs which is very less amount. Therefore, this issue may be

reviewed for true compliance of EC condition. The details are provided below and also at **Annexure-VI:**

Financial year	Coal Production (in tonnes)	CSR Expenditure as per EC condition of Rs. 5 per Te*	Actual CSR Expenditure (Rs.)	Medical Expenditure, CSR (Rs)
2014-15	6406000	32030000	4400828	117657
2015-16	6202278	31011390	113639	51635
2016-17	8925012	44625060	3675583	29902
Grand Total	21533290	107666450	8190050	199194

27. Environmental awareness week and similar kind of celebrations related to nature and environment has to be organized in the mine areas among the officers and staff at par with safety week.

CHAPTER 5

POST AUDIT CLARIFICATIONS AND FINAL CONCLUSIONS

Draft audit report was submitted to CIL *vide* ICFRE letter dated 02.11.2017 and the same was shared with concerned subsidiary (ECL) for their comments on the audit observation and findings from the CIL. The comments from ECL were received and the said issues/comments were further discussed in a joint meeting of ICFRE and concerned officials of CIL and ECL in the office of CIL at SCOPE Complex, New Delhi on 16th and 17th August 2018. The content of issues discussed and final point wise clarifications/remarks of ICFRE audit team to comply with the EC condition is presented at **Table 5.1.** Further based on feedback and clarifications from WCL, the audit findings for Mining lease and land at point no 4.1 stands modified and same is presented at **Table 5.2.**

Table 5.1: Post Audit comments of PP on Draft audit report of ICFRE and clarification and final comments from ICFRE

A. Specific Conditions

S. No.	Specific Conditions stipulated by MoEF & CC, Govt. of India	Project Proponent Compliance (till the end of March, 2017)	Observations/Recommendations by ICFRE	Comment by Project Proponent	Clarification over comments of PP by ICFRE
vi.	Coal shall be transported by rail only. Coal transportation from mine to siding should be by conveyor belt. The loading to siding by pay loaders into railway wagons.	Coal is transported by rail through Sitalpur and Dalurban Railway sidings. Pay loaders are used for loading into railway wagons. New Railway Siding with Silo loading system in our premises itself is under construction.	This condition is partially complied by the PP as transportation of coal to the siding is through open trucks and not by conveyor as stipulated. At siding, loading is by pay loaders on rakes.	New railway siding is under construction (in the charge of RITES & Railways), which is likely to be completed till Dec. 2018. All coal will be transported under tarpaulin cover. No coal on public road will be transported.	The compliance is in progress. The PP has agreed to the suggestions of the ICFRE.
vii.	Independent network of railway siding inside cluster be developed. Railway sidings should be constructed at the earliest and till then proponent may use mechanically covered trucks for transportation of coal.	A new railway siding with Silos Loading System is under construction at Sonepur-Bazari project. Necessary steps in this direction are being taken. Proposed date of completion is March 2018. Trucks are covered manually because	Ground truth reveals that construction of railway siding is on full swing and likely to be completed by March, 2018. However, transport is still by open tippers and not by covered trucks as stipulated.	All coal will be transported under tarpaulin cover.	The PP has agreed to the observations of the ICFRE. The railway siding is under construction and likely to be completed by Dec. 2018.

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		mechanically covered trucks are not available in India.			
viii.	Three tier greenbelt shall be raised around the railway sidings and along the road sides to prevent dust and noise pollution.	Three tier green belts will be raised around Railway siding after the completion of the same. Along road sides continuous plantation is being done. Recently 10 Ha road-side plantation has been done in the FY 2015-16. 9.0 Ha plantation is proposed to be done along NH 60 in the FY 2017-18.	No greenbelt/safety zone plantation has been undertaken by the PP within the mine lease all along its boundary, around the railway sidings and along the road sides to prevent dust and noise pollution emanating from mining activities. Hence, the PP has to raise the thick greenbelt plantation by using plant species as suggested in **Annexure-V**.	Plantation has been done in 9.0 Ha land around the new railway siding in this FY 2017-18. Besides 10 Ha Road side plantation has also been done in FY 2015-16. Rs 1,23,75,000.00 has been deposited in the account of Ad-Hoc CAMPA on 28.09.2016 for creation of 7.5 m thick safety zone all along the mine lease boundary. Jobs have already taken up in this area to make this green belt. The compliance is under progress.	The implementation of the condition is under progress
xi.	Trees with deep rooted system should be planted so as to prevent soil	Deep rooted local mixed species are being planted to	The condition is partially complied. The PP should raise native	The native tree species which has deep root system such as	The PP has agreed to the condition to raise further plantations as per the EC

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	erosion.	prevent soil erosion. Plantation of *Vetiver sp.* (it has very deep roots) along with others species will be done in this monsoon season by IIT Kharagpur at OB dump of Sonepur-Bazari Project.	tree species which has deep root system such as *Acacia nilotica* (Babul), *Artocarpus heterophyllus* (Jack fruit), *Azadirachta indica* (Neem), *Ficus benghalensis* (Bargad), *Ficus racemosa* (Gular), *Ficus religiosa* (Pipal), *Haldina cordifolia* (Haldu), *Holoptelea integrifolia* (Papidi), *Lannea coromandelica* (Moin), *Mangifera indica* (Aam), *Syzygium cumini* (Jamun), *Tamarindus indica* (Imli), *Terminalia arjuna* (Arjun), etc. to prevent soil erosion, sliding of OB dumps and protecting the unstable areas.	*Artocarpus heterophyllus* (Jack fruit), *Azadirachta indica* (Neem), *Ficus benghalensis* (Bargad), *Ficus religiosa* (Pipal), *Syzygium cumini* (Jamun), *Mangifera indica* (Aam), *Tamarindus indica* (Imli), *Terminalia arjuna* (Arjun), etc. are being planted.	condition.

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xii.	Proponent should plant additional 10 Ha/year over the next 10 years at various locations in the cluster.	Complied with and additional 10 Ha road side plantations have been carried out in the FY 2015-16. 9.0 Ha. Plantations have been proposed for the FY 2017-18.	The compliance of the PP is not clear in the sense that the stipulated condition is for the plantation in additional 10 Ha/year over the next 10 years at the various locations in the cluster-12. If such is the case then the area at the end of the 10 years will be 100 Ha at the rate of 10 Ha/year for 10 years. Therefore, it is apprehended that the reported figure 181 Ha of land over the 3 years might be inclusive of all plantations in the cluster-12. It is advised that the PP should cross check the plantation figures and report accurately to this EC condition.	10 Ha plantations will be done each year.	The PP has agreed to the observations of the ICFRE.
xiii.	River/Nallah shall be de-silted and restored back to functional state.	Noted and agreed.	The condition is not complied. Two nallahs namely, *Tumni*	Tumni Nallah-Necessary bioengineering	The PP has agreed to the observations/ recommendations of the

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			and *Bonbahal* are located in the ML area of Sonepur-Bazari OCP. **Tumni Nallah:** It is passing towards northern side of the lease boundary and flowing from west to east and finally draining into the Ajay River. During the verification, it is noticed that the Nallah has been diverted along the northern side of lease boundary from its original path. The diverted Nallah bunds are eroded severely hence, the PP has to take necessary bio-engineering measures to protect the nallah banks from erosion. **Bonbahal Nallah:** It is originating from the ML area from southern side and flowing towards South-Eastern direction and finally draining into Ajay River. The PP has to de-silt the	Measures will be taken to protect the nallah banks from erosion. Bonbahal Nallah- The de-silting of the Nallahs at periodical intervals before and after monsoon seasons is being done.	ICFRE.

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			Nallahs at periodical intervals before and after monsoon seasons in order to restore it back to the functional state.		
xvi.	Separate drainage pattern be provided.	Not Applicable, since the mine is an open cast project.	The PP has to prepare the drainage pattern of the mine lease areas of cluster-12 and the same has to be submitted to MoEF & CC.	Drainage Pattern for Cluster no. 12 has already been provided in the EIA/ EMP reports.	The EC condition is complied with.
xx	The OB shall be completely re-handled at the end of the mining.	Noted and Agreed.	The compliance of the PP is not correct. In view of high stripping ratio, it is apprehended that the OB dumps cannot be re-handled as these are being biologically stabilized. It is suggested that the PP should approach to the MoEF & CC to review the condition by providing facts and figures.	Out of total estimated OB removal of 1166.54 Mcum, about 873.00 Mcum would be accommodated within the OCP as internal dump. Balance 293 M Cum of OB would be accommodated in the external dumps (404.74 Ha). This condition has already been given in the EC letter issued on 9th February, 2015 in the point no. (XIII).	The PP has agreed to the observations of the ICFRE.
Xxi	There shall be no residual OB dump after the	Noted and Agreed.	The compliance of the PP is not correct.	There will be only 404.74 ha external	There will be only 404.74 ha external dump as per EC condition.

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	mining.		The PP has to approach the MoEF & CC and review the condition as the existing OB dumps are technically and biologically being reclaimed and stabilized and cannot be re-handled at the end of the mining.	dump as per EC condition.	The PP has agreed to the EC condition, wherein it has been stipulated that 404.74 ha of external OB dumps will exist and cannot be re-handled at the end of the mining.
xxx	Water sprinkling system shall be provided to check fugitive emissions from loading operations, conveyor system, haulage roads, transfer points, etc. Major approach roads shall be black topped and properly maintained.	Water sprinkling system has been provided to check fugitive emissions. Water sprinklers with mist formation have been provided at input hopper, transfer point and discharge chutes. Major approach roads are black topped. Proper maintenance of roads is done regularly. Water sprinkling on the roads is done with the help of mobile water sprinklers.	It is observed that the coal transportation route and coal stockyard do not have fixed water sprinkling system, only periodical sprinkling by mobile tankers are plying causing high fugitive dust emission. Roads are by and large maintained but in rainy season lot of slush is getting accumulated, this needs to be properly addressed. Black topping and maintenance of the roads should be undertaken on regular basis.	Sufficient mobile water tankers have been provided to check dust emission at coal transportation routes & coal stock yard. Regular maintenance of the roads is being done in rainy season to prevent the sludge generation. Black topping and maintenance of the roads is being undertaken on regular basis.	The ICFRE reiterate its observation for installing fixed water sprinkling system. However, action taken on black topping and regular maintenance of the roads is subject to consideration as per EC.
xxxi.	The CSR cost should be	CSR project is being	The coal production details	As per present CSR	The ICFRE reiterate its

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<td>Rs 5 per Tonne of Coal produced which should be adjusted as per the annual inflation. Rs 1358 Lakh/annum shall be earmarked for holding medical camps from CSR fund.</td>
<td>implemented.
The CSR activities at Sonepur- Bazari OCP are done under following heads:
• Health Care
• Infrastructure
• Education Development
• Water Supply
Under Health care - Blood Donation Camps, Eye Camps & Medical service van to villagers for outdoor medical facilities. Black topped road has been constructed in Hansdiha Village. Essay and debate competition at Chinchuria Village to Promote Swachh Bharat Abhiyan.
A Project of Supply of Filtered Water to Nabagram Village under utilization of</td>
<td>and corresponding CSR cost as per EC and expenditure for the financial year 2014-15, 2015-16 and 2016-17 at Sonepur-Bazari area is provided in the table below:
<table>
<tr><th>Financial year</th><th>Coal Production (in tonnes)</th><th>CSR Expenditure as per EC condition of Rs. 5 per Te*</th><th>Actual CSR Expenditure (Rs.)</th><th>Medical Expenditure, CSR (Rs)</th></tr>
<tr><td>2014-15</td><td>64060000</td><td>32030000</td><td>44008288</td><td>1176757</td></tr>
<tr><td>20</td><td>62</td><td>310</td><td>11</td><td>51</td></tr>
</table>
</td>
<td>policy of CIL : For subsidiaries of CIL, fund for CSR should be allocated on 2 % of average net profit of the company for the immediate three preceding financial years or Rs. 2.0 per tonne of coal production of previous year whichever is higher.
CSR expenditure is for subsidiary as a whole & accounting of the same is monitored at ECL HQ level.

Various CSR Project Proposal for Sonepur Bazari Area with value of about Rs. 10 crores have already been put up in the year 2014-15, 2015-16 & 2016-17 and is pending due diligence end from behalf of other stakeholders(like NGO and Village Panchayet) and will be</td>
<td>observation as per the EC condition.
The CSR cost should be Rs 5 per Tonne of Coal produced which should be adjusted as per the annual inflation; however, less expenditure is incurred for the same.
The CSR proposal mentioned is subject to consideration and agreement by the CIL.</td>
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<tr><th>S. No.</th><th>Specific Conditions stipulated by MoEF & CC, Govt. of India</th><th>Project Proponent Compliance (till the end of March, 2017)</th><th>Observations/Recommendations by ICFRE</th><th>Comment by Project Proponent</th><th>Clarification over comments of PP by ICFRE</th></tr>
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<td>mine discharge water is proposed. Water of abandoned Bankola Mine will be treated and converted into drinking water.</td>
<td>
<table>
<tr><td>15-16</td><td>0227 8</td><td>113 90</td><td>36 39</td><td>63 5</td></tr>
<tr><td>2016-17</td><td>89 25 01 2</td><td>446 250 60</td><td>36 75 58 3</td><td>29 90 2</td></tr>
<tr><td>Grand Total</td><td>21 53 32 90</td><td>107 666 450</td><td>81 90 05 0</td><td>19 91 94</td></tr>
</table>

It is evident from production data for the referred period that an amount of about Rs. 10 Crores can be accrued for CSR activities as per EC condition. However, data on expenditure shows that only about Rs. 82 Lakhs has been incurred on CSR activities, which is very less amount. Therefore, it is suggested that fund allocation for CSR activities should be reviewed for true</td>
<td>hopefully implemented soon.</td>
<td></td>
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			compliance as stipulated in EC condition. Field inspection of some of the CSR activities was carried out, which were found in consonance with the reporting and satisfactory. The visited CSR activities includes the following: - Black topped road in New Hansdiha Village. - Street lighting in Bhaluka Village. - Construction of Pucca road from Khottadihi More to Chattisgonda. - Primary health centre at Bhaluka Village rehabilitated site.		
xxxiii.	Everybody in the core area should be provided with mask for protection against fugitive dust emissions.	Being complied with. Dust masks have been provided to everybody in the core area.	Though project proponent has provided Personal Protective Equipment (PPE), however, PPE compliance among the	Strict PPE compliance will be done.	The PP has agreed to the observations of the ICFRE.

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xxxiv.	Dust mask to be provided to everyone working in the mining area.	Dust masks for protection against fugitive dust emissions have been provided to the personnel working in mining area.	workers is very poor, therefore, strict PPE compliance should be ensured by the PP.		
xxxvi.	People working in the core area should be periodically tested for the lung diseases and the burden of cost on account of working in the coal mine area.	Complied with. Periodical Medical Examination (PME) of employees is being done regularly. Total 283 PME of company employees and 232 of contractual employees has been done in the FY 2016-17.	The central hospital at Kenda of Sonepur-Bazari mine site is equipped with Spirometry for occupational lung disease test. The records are well maintained, no severe case of Pneumocosis were noticed for the Sonepur-Bazari OCP. Further, it is suggested that all persons deployed in the mine (departmental as well as contractor) must be subjected to complete health check up periodically by National Institute of Miner's Health to ascertain ill effect of micro fine coal dust and carbonaceous gases emitted	Matter of health check-up of employees at National Institute of Miner's Health is being taken up by ECL, HQtr. PME of employees is being done regularly. Total 283 PME of company employees & 232 of Contractual employees has been done in the FY 2016-17.	The PP has agreed to the suggestions of the ICFRE.

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			due to spontaneous burning of coal in the mine and subsequent remedial measures. Further, it is suggested periodical health check up of HEMM operators should be undertaken by the PP to monitor the ill effects of vibration on the body of HEMM operators.		
xxxvii.	The mining area should be surrounded by green belt having thick closed thick canopy of the tree cover.	Noted and agreed. Plantation in 7.5 meter strip all along the boundary of the lease boundary within the mine lease area will be done. Rs. 1,23,75,000.00 have been deposited in Ad-hoc CAMPA A/c for this purpose.	The condition has not been complied by the PP. The greenbelt plantation has to be raised in the safety zone area within the mine lease all along its boundary, which acts as a protective barrier to reduce the dust and noise emanating from mining activities. No greenbelt/safety zone plantation has been undertaken by the PP all along the lease boundary. Hence, the PP has to raise the thick greenbelt/safety	Rs 1,23,75,000.00 has been deposited in the account of Ad-Hoc CAMPA on 28.09.2016 for creation of 7.5 m thick safety zone all along the mine lease boundary. Jobs have already taken up in this area to make this green belt.	The PP has deposited 1.23 crore for raising greenbelt under CAMPA fund and it is being implemented as per EC condition.

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			zone plantation within the lease area with tall, fast growing including fruit bearing native plant species as suggested in **Annexure-V**.		
xxxviii.	Besides carrying out regular periodic health check-up of their workers, 10% of the workers identified from workforce engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any, through an specialized agency /institution within the District/State and the results reported to this Ministry and to DGMS.	Noted and agreed.	The PP should select workers to the tune of 10% as stipulated (Departmental as well as Contractual) to be sent to National Institute of Miner's Health for health check up as third party validation as stipulated.	Matter of health check-up of employees at National Institute of Miner's Health being done by ECL, HQtr. Proposal has been sent to ECL HQ. HQ has been activated to get it done.	The PP has agreed the ICFRE observations and recommendations.
xli.	Catch drains and siltation ponds of appropriate size shall be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water	Garland drain has been provided along the toe of external dump for collecting and discharging rain water from soil and	The condition is partially complied towards point numbers xli and xlii. Kutcha catch/garland drains are provided to protect the mine pit from the surface	Catch/garland drains all along the toe of all the OB dumps is being constructed & will properly being de-silted before and	The PP has agreed the ICFRE observations and recommendations.

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	so collected shall be utilized for watering the mine area, roads, green belt development, etc. The drains shall be regularly de-silted and maintained properly. Garland drains (size, gradient and length) and sump capacity shall be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity shall also provide adequate retention period to allow proper settling of silt material.	OB dumps. Drain is being maintained properly and cleaning is being done regularly.	run-off water. At few places, kutcha garland drain has been made at the toe of the external OB dumps and is partially filled with silt and sediments. Kutcha catch/garland drains all along the haul roads are made and are completely filled with OB boulders, silt and sediments. Catch drains are made all along the office road which is filled with silt and sediments. The PP has to strengthen the catch/garland drains and properly de-silt the drains before and during the monsoon season. Further, it is suggested to construct the catch/garland drains all along the toe of all the OB dumps which are to be connected to the Settling Tanks (ST) and finally drained into the mine sump. The mine sump water is initially allowed to	during the monsoon season.	
xlii.	Garland drains (size, gradient and length) around the safety areas such as mine shaft and low lying areas and sump capacity shall be designed keeping 50% safety	Garland drain has been constructed keeping sufficient safety margin over and above the peak sudden rainfall with an average width of 3m		Garland drains all along the toe of all the OB dumps is being constructed & will properly being de-silted before and during the monsoon season.	The PP has agreed the ICFRE observations and recommendations.

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	margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine sites. Sump capacity shall also provide adequate retention period to allow proper settling of silt material.	and average depth of 1.5 to 2.5 m.	pass through the ST followed by Silt Settling Pond (SSP), which is also acting as water recharge pond and thereafter the water in the SSP is used for industrial purpose. During the field visit, the SST was found completely filled with aquatic weeds making it unusable for the purpose. It is suggested that the PP has to make it usable by removing all the weeds and other aquatic plants growing in it, strengthen the bunds all around and also de-silt periodically before and after monsoon.		
xliii.	Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation shall be based on the rainfall data.	Proper benching in dumps is being done while maintaining slope stability to check run-off from OB dumps. Also regular plantation on OB dumps is carried out to stabilize the dumps	No retaining/toe-walls have been made at the bottom of both external and internal backfilling OB dumps. Hence, the PP has to construct retaining/toe walls at the bottom of both the external and internal backfilled OB dumps with	Retaining/toe walls will be constructed.	The PP has agreed the ICFRE observations and recommendations.

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		and check run-off.	proper catch/garland drains. The garland drains are to be connected to the mine sump after passing through the settling tank, so that the silt and sediments can be settled in the mine sump.		
xlvii.	The project authorities shall undertake regular repairing and tarring of roads used for mineral transportation. A 3-tier green belt comprising of a mix of native species shall be developed all along the major approach roads.	Regular repairing and maintenance of roads is being done. Tree plantation along the approach roads is being carried out regularly.	Road maintenance is of lower order and it should be upgraded, especially coal transportation route. Continuous 3-tier greenbelt plantation has not been made along both sides of the approach/transport roads. However, a sparse plantation has been observed at few places on both sides of office road which include both exotic and native plant species. Hence, the PP has to raise thick plantation all along the transport/approach roads with the local plant species as suggested in **Annexure-V** to prevent the dust and noise pollution.	Proper maintenance of roads is being done regularly. Plantation along both sides of the roads is being done.	The PP has agreed the ICFRE observations and recommendations.

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l.	The proponent should prepare restoration and reclamation plan for the degraded area. The land be used in a productive and sustainable manner.	Being complied with. Concurrent reclamation of the de-coaled area is being carried out using the land in a sustainable manner.	Restoration and Reclamation plan for the degraded mine area prepared by the PP is not appropriate. Hence, the PP has to prepare a detailed Restoration and Reclamation plan for implementation of the bio-engineering measures to bring back the mine degraded area for productive use.	Mine closure plan is going to be revised. Restoration & Reclamation is included in Mine closure plan and the same will be done as per the approved mine plan.	The PP has agreed the ICFRE observations and recommendations.
liv.	Regular monitoring of groundwater level and quality shall be carried out by establishing a network of existing wells and construction of new piezometers. The monitoring for quantity shall be done four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons and for	Regular monitoring of well water level and quality is carried out by CMPDIL. The results indicate good quality of ground water. All the data collected are being regularly submitted to the MoEF & CC and to the WBPCB with the half yearly compliance report.	At Sonepur-Bazari OCP area, there is no ground water quality station. The bore well monitored is of other mines of the Cluster-12. Only mine water is monitored. Piezometers as suggested are not yet installed. Hence, it is suggested that few well falling in the cluster 12 should be identified for quality check.	Installation of Piezometers is under process.	The compliance is in process.

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	quality in May. Data thus collected shall be submitted to the Ministry of Environment, Forests & Climate Change and to the Central Pollution Control Board quarterly within one month of monitoring.				
lv.	The Company shall put up artificial groundwater recharge measures for augmentation of groundwater resource in case monitoring indicates a decline in water table. The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.	Artificial recharge measures are not required since ground water level trends show an uptrend in 4 out of the 5 wells being monitored. Tanker water is provided to nearby needy villages on demand basis regularly. Financial help is also provided on opening of new wells, their maintenance and installation of hand pumps.	Mining activity always intersects ground water table and mine sump pumping and utilisation in industrial use always creates a negative water balance especially during summers. Therefore, it is suggested that possibility should be explored to create recharge structure by implementing roof top harvesting and creating lagoons outside the periphery of the mining pit.	Lagoons have been made in the nearby villages. Ponds for collection of rain water have been made at various places in rehab site etc.	The condition is being complied with.
lvi.	Sewage treatment plant	A Sewage Treatment	Both the ETP and STP are	Construction of ETP	The condition is under

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	shall be installed in the existing colony. ETP shall also be provided for workshop and CHP wastewater.	Plant (STP) with capacity 600 cum/d is proposed at R.N. Colony of Sonepur-Bazari Project for an estimate of Rs. 2.85 Cr. An Effluent Treatment Plant (ETP) with capacity 7200 cum/d is proposed for workshop and CHP waste water. Approval of ETP design and layout for an estimate of Rs. 2.06 Cr. has been obtained from Headquarter ECL. Now the work is in tendering process.	non- existent. The oil and grease trap at workshop is defunct and is not in working condition and these should be expedited judiciously.	& STP is under construction. Work order has been issued on 21.10.2017.	implementation.
lix.	A detailed Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment, Forest & Climate Change within 6 months of grant of Environmental	Being Complied with.	After careful verification of the mine closure plan, it is suggested that the detailed mine closure plan is to be prepared by the PP.	Mine closure plan is under revision at CMPDIL.	The condition is being complied.

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	Clearance.				

B. General Conditions

S. No.	General conditions stipulated by MoEF & CC, Govt. of India	Project proponent Compliance	Observations/ Recommendations by ICFRE	Comment by Project Proponent	Clarification over comments of PP by ICFRE
iii.	Four ambient air quality monitoring stations shall be established in the core s\zone as well as in the buffer zone for PM_{10}, $PM_{2.5}$, SO_2 and NO_x monitoring. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc carried out at	Ambient air quality monitoring is being done at cluster level. 14 (fourteen) ambient air quality monitoring stations have been established within cluster 12, after detailed study of the project area and local meteorology. Quarterly monitoring is carried out on the above stations regularly through CMPDIL.	The monitoring of air quality is being done at locations/stations in consultation with State Pollution Control Board (SPCB). Reports of these monitoring is submitted to the SPCB as specified. The reports are also submitted on six monthly bases to the Ministry of Environment, Forests & Climate Change and this is also uploaded on the site of the company. These reports were examined by the audit team. The parameters monitored are SPM, RPM, SO_2 and	Air quality monitoring is being carried out as per NAAQS through CMPDIL. CMPDIL has been made aware of this and accordingly the measurement will be done.	The PP has agreed to the observations of the ICFRE.

S. No.	General conditions stipulated by MoEF & CC, Govt. of India	Project proponent Compliance	Observations/ Recommendations by ICFRE	Comment by Project Proponent	Clarification over comments of PP by ICFRE
	least once in six months.		NO_X as prescribed by Gazette Notification (GSR 742/E) dated - 25th September 2000. The said notification prescribes these parameters for monitoring stations laid within 500 m of the dust generating sources. However, CMPDI has carried out monitoring as per the parameters irrespective of their location *vis-a-vis* dust generating sources. The report specifies the location of the monitoring stations but do not specify the distances and the dust generating sources. The provisions of GSR 742/E dated - 25th September 2000 states that if any residential, commercial or industrial place falls within 500 m of any dust generating sources, National Ambient Air Quality Standard (NAAQS) standards will be applicable for monitoring.		

S. No.	General conditions stipulated by MoEF & CC, Govt. of India	Project proponent Compliance	Observations/ Recommendations by ICFRE	Comment by Project Proponent	Clarification over comments of PP by ICFRE
			The monitoring at these stations should be carried out as per NAAQS. The standard prescribed by GSR 724/E have two values for each parameter, *viz.,* 24 hourly average and annual average. The reports give only 24 hourly values in periodical report. The annual report and annual averages values are provided. The values of parameters monitored vary over a narrow range. Even seasonal variations, due to change of wind directions are not reflected in the measured values. The analyses of 12 parameters prescribed *vide* gazette notification No.GSR 826(E) dated 16.11.2009 has been carried out. The EC prescribes that once in a year certain heavy		

S. No.	General conditions stipulated by MoEF & CC, Govt. of India	Project proponent Compliance	Observations/ Recommendations by ICFRE	Comment by Project Proponent	Clarification over comments of PP by ICFRE
			metals like Hg, As, Ni, Cr, etc., are to be monitored. The same are also being monitored. The general guideline of MoEF & CC is that at least one station should be monitored on the upwind side of the wind direction and two stations on the downwind side. This is being followed by covering all the mines falling in cluster-12, and stations have remained constant throughout the year.		
vi.	Industrial waste water (workshop and wastewater from the mine) shall be properly collected, treated so as to conform to the standards prescribed under GSR 422(E) dated 19th May 1993 and 31st December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed	Sedimentation of mine water takes place in the mine sump where sufficient retention time for siltation process is given to set down properly. Construction of an ETP for treatment of waste water from workshop and CHP is under process. Oil and grease trap has	Mine water is effectively used for industrial purposes after due sedimentation through siltation ponds but waste water from HEMM washing are not treated properly. Oil and grease traps are defunct. Immediate attention should be paid to this facility.	Maintenance of Oil & grease trap is going on. Construction of ETP is also under construction.	The compliance is in progress.

S. No.	General conditions stipulated by MoEF & CC, Govt. of India	Project proponent Compliance	Observations/ Recommendations by ICFRE	Comment by Project Proponent	Clarification over comments of PP by ICFRE
	before discharge of workshop effluents.	been provided at workshop.			
6	The proponent shall abide by all the commitments and recommendations made in the EIA/EMP report so also during their presentation to the EAC.	The PP has not made any comment on the condition.	The PP should agree to this point and report accordingly.	Agreed	The condition is being complied.
7.	The commitment made by the proponent to the issue raised during Public Hearing shall be implemented by the proponent.	The PP has not made any comment on the condition.	The PP should demonstrate the implementation of the commitments for Public hearing on ground and report accordingly.	Being implemented	The condition is being implemented by the PP.
8	The proponent is required to obtain all necessary approvals that may be required before the start of the project.	The PP has not made any comment on the condition.	The PP should list out all the statutory approvals for reporting to the MoEF & CC.	All required approvals are being obtained.	This is being complied by the PP.
9	The ministry or any other competent authority may stipulate any further condition for environmental protection.	The PP has not made any comment on the condition.	The PP should agree to this point.	Agreed.	The PP has agreed to this point.
11	Concealing factual data or submission of falls/fabricated data and failure to compile with	The PP has not made any comment on the condition.	The PP should agree to this condition.	Agreed.	The PP has agreed to this point.

S. No.	General conditions stipulated by MoEF & CC, Govt. of India	Project proponent Compliance	Observations/ Recommendations by ICFRE	Comment by Project Proponent	Clarification over comments of PP by ICFRE
	any of the conditions maintained above may result in withdrawal of this clearances and attract action under the provision of environment (Protection) Act 1986.				
13	Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under sec. 16 of National Green Tribunal, 2010.	The PP has not made any comment on the condition.	The PP should agree to this point.	Agreed.	The PP has agreed to this point.
14	The EC supersedes the earlier EC's obtained for the existing mines in the cluster.	The PP has not made any comment on the condition.	The PP should agree to this point.	Agreed.	The PP has agreed to this point.
Additional Specific Conditions stipulated by MoEF & CC, Govt. of India					
14 (ii)	In view of the high levels of PM_{10} around the Basabdanga and some other villages, immediate steps should be taken to make water sprinkling	The PP has not responded to this stipulation and not submitted the compliance to the MoEF & CC.	Basabdanga area falls in the Buffer of Cluster-11. The main cause of high fugitive emission is due to high quantum of coal transport.	Basabdanga village has been rehabilitated I the dust free zone.	The PP has not understood the recommendations of the ICFRE. Hence, it is advised that PP should take corrective actions for compliance of the EC condition.

	arrangements and to provide an adequate and effective green belt around these villages so that the PM 10 levels are reduced		The monitoring data from CMPDI was audited and it was found that during monsoon period there is reduction in PM_{10} concentration and post monsoon. The concentration of PM_{10} during summer is ranging between 105 and 110. It is recommended that proponent should increase the frequency of sprinkling all along the transport road. It is also advised that the PP has to raise thick greenbelt around this area.		

Table 5.2 Final Clarification from ICFRE on Audit report for audit for Mine lease and Land

SN.	Reference from ICFRE EA report and EC condition	Observations from WCL on EA report	Clarification/View of ICFRE over WCL observations	Feedback on clarification from the ICFRE	Final Comments from ICFRE
1.	ICFRE report Audit findings chapter 4, 4.1 Mining Lease and Mining	The issue raised by ICFRE Regarding the Status of land vis-à-vis mining lease needs to be deliberated at priority at appropriate level. CIL is requested	In the light of observation from WCL, CIL is requested to see the position of grant of mine lease for this mine whether mine lease grant accorded as per CBA Act or MMDR act and communicate back accordingly to the ICFRE.	Regarding grant of mine lease of Ukni Deep OC mine, as per MoC's letter No.43015/28/2017-LAIR (Vol.II) dated 13.07.2018 (enclosed), "By virtue of the provisions of section 10 and 11of the coal Bearing Areas (Acquisition and Development) Act, 1957, the land or the rights in or over the land acquired under the	The clarifications from PP in the light of the letter from MoC and judgement of Hon'ble Supreme court in the matter is agreed. Accordingly the

		for advice and the needful.		Act vest absolutely with the Central Government or the nominee, that is, a Government Company. The land gets vested in the Central Government on the publication of notification under section 9 and thereafter in the Govt. Company on the publication of declaration under section 11(1) of the ibid Act. Accordingly, since the land acquired under the Act vests absolutely in the Government Company, there is no necessity for execution of Mining Lease with the State Government. The issue of requirement of Mining Lease in case of lands acquired under CBA Act, has been settled by Hon'ble Supreme Court in Bharat Coking Coal Ltd. Vs. State of Bihar [1987 (suppl) SCC 394], wherein the Court observed that "once the acquisition is made under the Coal Bearing Areas (Acquisition and Development) Act, 1957, requisite declaration was issued by the Central Government to grant Lease as the land vests in the Central Government." The said findings of the Hon'ble Supreme Court has also been followed by the Division bench of High Court of MP in Western Coalfields Limited and Ors vs State of MP and Anr (AIR 2007 MP 75)." Similarly, MoC issued another letter *vide* No. 43024/1/2004/PRIW-1 dated 28.11.2007 on the subject Renewal of All Rights/ Mining Rights acquired under CBA (A&D) Act, 1957.(Enclosed). Hence granting of lease by State Government is not required.	observations of ICFRE in the audit report Chapter-4 at Para 4.1 stands deleted from the report.

Plate-1: Diverted Tumni nallah bunds not protected with bio-engineering measures

Plate-2: Black topped road in Hansdiha Village, Sonepur- Bazari Area

Plate-3: Garland drain around the mine pit of Sonepur- Bazari OCP

Plate -4: Well laid catch drain but filled with silt and sediments along the office approach road

Plates Showing Different Components under Sonepur-Bazari OCP

Plate -5: Unmaintained silt settling pond covered with aquatic weeds

Plate -6: Settled mine sump water pumping into settling tank

Plate -7: Thick plantation made on waste land in the ML area

Plate -8: Transport of coal without covering tarpaulin

Plates Showing Different Components under Sonepur-Bazari OCP

Plate -9: Severely eroded external OB dump- G

Plate -10: Severely breached external OB dump-D

Plate -11: Biologically stabilized External OB dump (A-5)

Plate -12: Poorly maintained Sitalpur railway siding

Plates Showing Different Components under Sonepur-Bazari OCP

Annexure – I

03/08 2015 13:06 91 33 22435542 CIL-PROJECT MONITORING #5255 P.001

Telefax No : 033-23244044
e-mail : gmpm@coalindia.in

कोल इण्डिया लिमिटेड
COAL INDIA LIMITED
परियोजना प्रबोधन विभाग
PROJECT MONITORING DIVISION
एक्शन एरिया - १ए न्यु टाउन ,कोलकता -700156
Action Area- 1A, New Town, Kolkata- 700156

पत्रांक: CIL/PMD/ 36/241 दिनांक: 31.07.2015

Environment Management Division Dy.No. 378 Dated 5/8/15 ICFRE

Indian Council of Forestry Research & Education Director General Office 03 AUG 2015 001437 P.O.New Forest, Dehradun

सेवा में,
The Director General
Indian Council Forestry Research and Education
Ministry of Environment, Forests and Climate Change
Govt of India
Dehradun

विषय: ***Environmental Audit of 20 OC Mines of CIL***

महोदय,

The Indian Council Forestry Research and Education (ICFRE) is hereby entrusted to carry out an environmental audit of 20 OC Mines (list enclosed) as per following terms & conditions :-

Scope of Work :

1. *To review conditions laid down in the EC approval for mitigation of environmental pollution.*
2. *To assess the compliance with the project approval conditions and other approval of the mines vis-à-vis progress of development of the mine.*
3. *To conduct site inspection, verify the existing levels of pollution vis-à-vis the laid down standards; review on-site documentation, monitoring data, mechanism in place for sampling and analysis that are relevant to the audit.*
4. *Discussion/consultation with the concerned project staff on the development consent, other approval condition, infrastructure and operation to comply the EC.*
5. *To assess environmental performance based on the development with the requirements of the approval of the EC and mining lease conditions (including any assessment , plans or programs required under these consents /approvals).*
6. *To assess the progressive mine closure vis-à-vis technical, green belt development, biological reclamation of over burden (OB) , top soil management and review the adequacy of the strategies , plans or programs prepared for its effectiveness.*
7. *To assess the status of final mine closure for the mines that have exhausted the reserves.*
8. *To assess the change detection of Open/ UG mining activities and reclamation based on a machine learning approach through imagery, advancement in assessment and monitoring.*
9. *Provisions of recommendations , if considered necessary for implementation of measures or actions to improve environmental performance of the development and /or any assessment , plan or program required under the mine approvals.*

कार्यालय उप महानिदेशक (विस्तार) डाक सं 563 दिनांक 3/8/2015 फाईल सं ... आई.सी.एफ.आर.ई. देहरादून

For kind perusal
3/8

DG, ICFRE

DDG. Extn.
3/8
DG.

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10. *Preparation of individual Environmental Audit Report providing assessment of compliance against each approval condition and provision of recommendations or actions considered appropriate to improve the environmental performance of the development, and/or the environmental management and monitoring systems.*
11. *After completion of environment audit of each subsidiary, ICFRE shall present an interim report at CIL or any other place as advised and*
12. *ICFRE shall submit final report after incorporating the comments of CIL and/or its subsidiaries on the draft report.*

Financial involvement :

Rs 259.35 Lakhs (Rs Two Hundred Fifty Nine Lakhs and Thirty Five Thousands only) plus taxes as per rules.

Terms of payments are :

On acceptance of work order	:	*50%*
On completion of field work & submission of Final Environmental Audit Report of 15 mines	:	*25%*
On completion of field work & submission of Final Environmental Audit Report of balance 5 mines	:	*25%*

At the time of final payment , a self certification would be submitted by ICFRE that due norms of the Institute had been followed for deployment of manpower and TA/DA expenses.

Duration :

The time schedule for completion of the task would be 20 months from the date of issue of the work order. However, the time frame is subject to the field condition and requirement of data from the individual mines.

The earlier Work Order No. CIL/PMD/36/138 dt 01.06.2015 & subsequent Corrigendum No. CIL/PMD/36/184 dt 26.06.2015 on the subject matter may be treated cancelled. Acceptance of the job may kindly be communicated at the earliest.

This issues with the approval of the competent authority.

भवदीय,

1.7.2015

(तापस कुमार सिंहा)
महा प्रबंधक,
परियोजना प्रबोधन विभाग

संलग्न : यथोपरि

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Share of individual subsidiaries to be paid to Indian Council of Forestry Research and Education (ICFRE), Dehradun for Environmental Audit of the mines of different subsidiaries of Coal India Limited.

O/SL	SL	SUB	Name of Mines	Subs. Share
1	1	MCL	Lakhanpur	Rs 39.00lakhs plus taxes as per Rules
2	2	MCL	Samleswari	
3	3	MCL	Bhubaneswari	
4	1	NCL	Nigahi	Rs 39.00lakhs plus taxes as per Rules
5	2	NCL	Jayant	
6	3	NCL	Amlohri	
7	1	CCL	Piparwar	Rs 39.00lakhs plus taxes as per Rules
8	2	CCL	Ashok	
9	3	CCL	Rohini	
10	1	SECL	Gevra	Rs 52.00lakhs plus taxes as per Rules
11	2	SECL	Dipka	
12	3	SECL	Kusmunda	
13	4	SECL	Manikpur	
14	1	ECL	Rajmahal	Rs 26.00 lakhs plus taxes as per Rules
15	2	ECL	Sonepur Bazari	
16	1	WCL	Kamptee	Rs 26.00 lakhs plus taxes as per Rules
17	2	WCL	Ukni Deep	
18	1	BCCL	Tetulmari	Rs 38.35 lakhs plus taxes as per Rules
19	2	BCCL	Dahibari Basantimata	
20	3	BCCL	Damoda	

Annexure- II

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No.516/1-81/2015-ADG(EM)/EA-CIL/ICFRE
Indian Council of Forestry Research & Education,
(An Autonomous Body of Ministry of Environment, Forests & Climate Change, Govt. of India)
Environment Management Division,
P.O. New Forest, Dehradun-248006 (Uttarakhand)

Dated: 30.01.2015

To,

Shri N. Kumar,
Director, Technical,
M/s Coal India Limited,
Project Monitoring Division,
Kolkatta (West Bengal)

Sub: Environmental Audit of Coal Mines operated by Coal India Limited and Subsidiary Coal Companies – reg.

Sir,

Please refer to your letter No.CIL/PMD/14/367 dated 22.09.2014 on the above mentioned subject.

In this connection, please find enclosed a copy of the proceedings of the meeting held on 16.01.2015 with officials of Coal India Limited at Indian Council of Forestry Research & Education (ICFRE), Dehradun for finalization of proposed Environmental Audit of Coal Mines for information and necessary action.

As discussed in the said meeting, if agreed, ICFRE would submit the technical and financial proposal to start with for 20 open cast mines and would subsequent submit for rest of the 5 underground mines. It is, requested that necessary consent for the same may be conveyed at an early date for further necessary action in the matter.

Yours faithfully,

30/01/2015

Encl: As above

(Sudhir Kumar)
Asstt. Director General (EM)
Telefax-0135-2753882

Copy with a copy of above enclosure to:-

1. DDG (Extn.), ICFRE
2. Shri K. Chakraborty, General Manager (Env.), Western Coalfields Limited (HQ.)
3. Shri JI.N. Biswal, General Manager (Env.), Eastern Coalfields Limited (HQ.)
4. Shri S.R. Tripathi, Sr. Manager (Env/Mining), South Eastern Coalfields Limited (HQ.)

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Proceedings of the meeting held on 16.01.2015 with Coal India limited officials at Indian Council of Forestry Research and Education (ICFRE), Dehra Dun for finalization of proposed Environmental Audit of Coal Mines

Meeting with officials from Coal India Limited was held on 16.01.2015 in the committee room of ICFRE, Dehra Dun. The overall objective of the meeting was to discuss and workout the modalities and plan for undertaking the proposed Environmental Audit study in the coal mines operated by Coal India and Subsidiary coal companies.

Following officer and scientists attended the meeting:

Sh. Sudhir Kumar Asstt. Director General (EM)- ICFRE
Sh K. Chakraborty, General Manager, (Env) Western Coalfields Limited (HQ)
Sh J.N Biswal General Manager, (Env) Eastern Coalfields Limited, (HQ)
Sh S.R Tripathi , Sr Manager (Env/ Mining),South Eastern Coalfields Limited(HQ)
Dr. V. Jeeva, Scientist-E- ICFRE
Dr. A.N. Singh Scientist –E- ICFRE
Dr . Vishavjit Kumar Scientist-C- ICFRE
Dr. Om Kumar Scientist –C- ICFRE
Sh. Alok Yadav - Scientist C- ICFRE

The meeting started with warm welcome and an introductory remark on the purpose of the meeting by, ADG (EM), ICFRE.

The Terms of Reference (ToR) provided by the Coal India limited and the scope proposed by ICFRE were discussed in details. Deliberation was held on selection of sample mines to be identified by Coal India. The study should adequately address the environmental and community security, keeping in view the year, size of mine area, and area of the cluster that has composition of various other parameters that contributes to risk. Deliberation on corporate social responsibility and other issues related to social environment were also discussed to address the environmental risk. After the detailed discussion on the proposed objectives, following issues were discussed and agreed upon:

1. Awaited mines details (name, location, lease period, total area, and copies of EC & FC etc) related information from the following four subsidiaries of CIL will be provided by end of this month.
   (i) Central Coalfield Limited (CCL)
   (ii) South Eastern Coalfield Ltd (SECL)
   (iii) Eastern Coalfield Ltd (ECL)
   (iv) North Eastern Coalfield Ltd (NECL)

(90)

2. Study will be carried out based only on actual field verification, do cuments, spatial& temporal data documented for the environmental parameters and the satellite surveying data available at CMPDI, Ranchi. In addition selective sampling will also be made to assess the environmental performance where ever required.
3. Mining Plan, Mining Scheme, EIA/EMP, EC, FC, PFR, Mine Closure Plan, R&R Plan, CTO, Violations if any and their compliance, Progress Reports, EC and FC Compliance Reports, reclamation monitoring reports, spatial & temporal data (including shape files and satellite imageries) in softcopy and any other study report for the concern mines proposed will be required . The same will be provided by CIL to ICFRE, once the mines are identified and the work order is awarded.
4. During the meeting, it was discussed and suggested to undertake the work in phased ma nner. (To start with ICFRE may submit the technical and financial proposal for the proposed study to undertake 20 open cast mines which have comparatively more environmental ramifications compared to underground.)
5. The study in the proposed five underground mining which may involve Directorate General of Mine Safety (DGMS) in respect of underground environment, shall be carried out in the next phase. For which specific subject expert would be required and ICFRE may identify Central Institute of Mining and Fuel Rese arch (CIMFR) Dhanbad and subject matter experts for underground mine.
6. Further, the Officials from Coal India Limited invited ICFRE team to visit any mine to understand the level of documents, information available to further identify the gaps and to work out the methodology and time line.
7. The Officials from CIL also met the Deputy Director General (Extension), ICFRE and briefed the discussion held during the meetings.

30/01/2015

Assistant Director General (EM)
Environment Management Division
Indian Council of Forestry Research and Education
P.O. New Forest
Dehradun - 248 006 (Uttarakhand)

Annexure – III

(114)

By Speed Post/Fax

No. 1-81/2015-ADG(EM)/EA-CIL/ICFRE
Indian Council of Forestry Research & Education,
(An Autonomous Body of Ministry of Environment, Forests & Climate Change, Govt. of India)
Environment Management Division,
P.O. New Forest, Dehradun-248006 (Uttarakhand)

Dated: 01.04.2015

To,

Shri T.K. Sinha, ,
General Manager (PMD),
M/s Coal India Limited,
Project Monitoring Division,
10, N.S Road,
Kolkata-700001 (West Bengal)

Tele Fax No.033-22435542

Sub: Environmental Audit of Coal Mines operated by Coal India Limited and Subsidiary Coal Companies – Submission of Technical and Financial proposal reg.

Sir,

Please refer to your letter No.CIL/PMD/02/53 dated 27.02.2015 on the above mentioned subject.

In continuation to this office letter No.123/1-81/2015-ADG(EM)/EA-CIL/ICFRE dated 23.03.2015, it is intimated that Shri Saibal Dasgupta, IFS, Dy. Director General (Extn.), ICFRE accompanied by the undersigned reaching Kolkatta on 10.04.2015 and would like to meet and discuss the matter at **4.00 P.M.** on the said date.

You are, therefore, requested to kindly make it convenient to have discussion in your office on the aforesaid date and time for finalization of work modality for environmental auditing of 20 open cast mines.

A line in confirmation by fax shall be highly appreciated.

Yours faithfully

01/04/2015

(Sudhir Kumar)
Asstt. Director General (EM)
Tel. & Fax No.0135-2753882
E-mail ID: sudhir@icfre.org

Copy to DDG (Extn.), ICFRE for information please.

(110)

From: GM CIL PMD - TAPAS KUMAR SINHA <gmpm@coalindia.in>
To: "sudhir@icfre.org" <sudhir@icfre.org>
Cc: DT CIL - Nagendra Kumar <dtcil@coalindia.in>

Date: Thursday, March 26, 2015 03:16PM
Subject: RE: Technical & Financial for Environmental Audit - Meeting at CIL, HQ

History: This message has been replied to and forwarded.

Dear Sir,

Thanks for your response.

This is to inform you that the meeting may be scheduled at 4.00 PM on 9th April 2015 at CIL, HQ, at 10 N S Road, Kolkata-700001.
However, if you have any difficulty with this date, it may be fixed on 10th April 2015 also.

Director (Tech), CIL may also like to participate in the discussion.

Thanking you,

Yours,
TK Sinha, GM (PMD), CIL

From: sudhir@icfre.org [sudhir@icfre.org]
Sent: 26 March 2015 13:26
To: GM CIL PMD - TAPAS KUMAR SINHA
Cc: DT CIL - Nagendra Kumar; saibaldasgupta@hotmail.com
Subject: RE: Technical & Financial for Environmental Audit

Dear Sir,

The Terms and Reference, as mentioned below of the letter dated 22.09.2014 are acceptable to ICFRE and if required may also be mentioned in your work order. As intimated vide my earlier mail, we are likely to visit Kolkata tentatively on 9th or 10th April 2015. During the visit, we may like to have discussion on the proposal submitted for environmental auditing to schedule our action plan. Please confirm your convenience for the above mentioned dates.

Thanking you,

Annexure-IV

LIST OF TEAM MEMBERS

Team Leader: DG, ICFRE

Co-Team Leader: DDG (Extension), ICFRE

Co-ordinator: Dr. Sudhir Kumar, ADG (EM), ICFRE

TEAM MEMBERS AT ICFRE LEVEL

1. Dr. V. Jeeva, Scientist –F, ICFRE
2. Dr. A. N. Singh, Scientist –F, ICFRE
3. Dr. Vishavjit Kumar, Scientist –D, ICFRE
4. Sh. Chandra Sharma, Research Officer, ICFRE

AUDIT TEAM AT MINE LEVEL

1. Dr. V. Mohan, Scientist-G, IFGTB, Coimbatore
2. Sh. Anish V. Pachu, RA- I, IFGTB, Coimbatore
3. Dr. N. Rama Rao, Domain Expert
4. Sh. S. K. Agrawal, Domain Expert
5. Dr. D. K. Roy Chowdhury, Domain Expert

Annexure-V

RECOMMENDED LOCAL PLANT SPECIES

Sonepur-Bazari OCP

The local plant species are recommended for plantation in the mined out backfilled areas, OB dumps, degraded areas, greenbelt and avenue plantation along the approach/transportation roads based on climate, rainfall and natural vegetation found in and around the mine lease areas of Sonepur- Bazari OCP of ECL. These plant species can stabilize the degraded areas very successfully.

Afforestation/Avenue plantation/Greenbelt:

Avenue plantation along the approach/transport roads are made at few places and it is not continuous. The development of greenbelt in the safety zone has not been made all around the mine lease area to prevent the dust and noise pollution by the project authorities.

Following native plant species are suggested/recommended to plant in the project area and proposed township, greenbelt, gap plantation areas and avenue plantation all along the approach/transport roads (**Table 1**).

Table-1: Species suggested for Plantation

S. No.	Plant Species
1.	*Acacia nilotica* (Babul)
2.	*Aegle marmelos* (Bel)
3.	*Ailanthus excelsa* (Maha neem)
4.	*Albizia lebbeck* (Siris)
5.	*Albizia odoratissima (*Kala siris)
6.	*Alstonia scholaris* (Sathpathri)
7.	*Artocarpus heterophyllus* (Jack fruit)
8.	*Azadirachta indica* (Neem)
9.	*Bombax ceiba* (Semal)
10.	*Cassia fistula* (Amaltas)
11.	*Dalbergia sissoo* (Shisham)
12.	*Ficus benghalensis* (Bargat)
13.	*Ficus racemosa* (Gular)
14.	*Ficus religiosa* (Pipal)
15.	*Gmelina arborea* (Ghamar)
16.	*Haldina cordifolia* (Haldu)
17.	*Holoptelea integrifolia* (Papidi)
18.	*Lannea coromandelica* (Moin)

19.	*Mangifera indica* (Aam)
20.	*Neolamarckia cadamba* (Kadamba)
21.	*Phyllanthus emblica* (Amla)
22.	*Pongamia pinnata* (karanj)
23.	*Syzygium cumini* (Jamun)
24.	*Tamarindus indica* (Imli)
25.	*Terminalia arjuna* (Arjun)
26.	*Trema orientalis*

Greenbelt

No greenbelt/safety zone plantation has been made by the PP all along the lease boundary. Hence, the PP to raise the greenbelt around within the lease area with tall, fast growing, fruit bearing native plant species as suggested in **Table-1**.

OB Dumps

As per the physical features of the terrain, dumping should be carried out by adopting retreating method starting from bottom and reaching to the top by creating terraces of 20 m height and 15 m width and the overall slope of the OB dump should not exceed 28 degrees. Berms should be provided at the toe of each terrace to avoid water flow over the dump slopes. Wherever necessary, retaining/toe walls and garland drains should be provided on every terrace and the drains have to be connected to the vertical drains and finally the water has to be drained into the mine sump for proper settlement. After completion of each terrace (bottom to top), plantation has to be carried out immediately using the plant species suggested in **Annexure-V**.

The PP has to undertake massive afforestation activities on the backfilled OB dumps in the de-coaled quarry areas and on the external OB dumps after spreading the top soil by using native plant species immediately as suggested in **Table 2**.

Table 2: Plant species recommended for stabilization of backfilled OB dumps in the decoaled areas

S. No.	Plant species
1.	*Acacia nilotica* (Babul)
2.	*Aegle marmelos* (Bel)
3.	*Ailanthus excelsa* (Maharuk)
4.	*Albizia lebbeck* (Siris)
5.	*Albizia odoratissima (*Kala siris)
6.	*Albizia procera* (Safed siris)
7.	*Alstonia scholaris* (Sathpathri)
8.	*Anogeissus latifolia* (Dhawda)
9.	*Annona squamosa* (Sitaphal)

10.	*Artocarpus heterophyllus*(Jack fruit)
11.	*Azadirachta indica* (Neem)
12.	*Bambusa arundinacea* (Kata Bans)
13.	*Bombax ceiba* (Semal)
14.	*Butea monosperma* (Palas)
15.	*Cassia fistula* (Amaltas)
16.	*Dalbergia sissoo* (Shisham)
17.	*Dendrocalamus strictus* (Bans)
18.	*Diospyros melanoxylon (*Tendu)
19.	*Ficus benghalensis* (Bargat)
20.	*Ficus racemosa* (Gular)
21.	*Ficus religiosa* (Pipal)
22.	*Gmelina arborea* (Ghamar)
23.	*Haldina cordifolia* (Haldu)
24.	*Holoptelea integrifolia* (Papidi)
25.	*Lannea coromandelica* (Moin)
26.	*Mangifera indica* (Aam)
27.	*Neolamarckia cadamba* (Kadamba)
28.	*Phyllanthus emblica* (Amla)
29.	*Pongamia pinnata* (Karanj)
30.	*Syzygium cumini* (Jamun)
31.	*Tamarindus indica (*Imli)
32.	*Tectona grandis* (Shagun)
33.	*Terminalia arjuna* (Arjun)
34.	*Trema orientalis*
35.	*Vitex negundo* (Nirgindi)
36.	*Ziziphus mauritiana (Ber)*

Grasses and leguminous species recommended for stabilization of OB dumps and backfilled areas

The grasses/legumes help in stabilizing the OB dumps and backfilled areas and play an important role increasing the soil nitrogen status through nitrogen fixation. Also, these plants are associated with beneficial microbes like mycorrhizal fungi (VAM and Ectomycorrhizal fungi) and Plant Growth Promoting Rhizobacteria (PGPR). When these plants die, fixed nitrogen and other essential plant nutrients are released to the soil and helps in increasing fertility of the soil. Following species of local grasses and legumes are suggested for broadcasting the seeds on the slopes of the OB dumps and backfilled areas for further strengthening and stabilizations (**Table 3**).

Table 3: Grasses and leguminous species recommended for stabilization of OB dumps and backfilled areas

S. No.	Species	Propagation method
1.	*Apluda mutica*	Slips/seeds
2.	*Aristida setacea*	Slips
3.	*Cajanus scarabaeoides*	Seeds
4.	*Crotalaria juncea*	Seeds
5.	*Cymbopogon flexuosus*	Slips/seeds
6.	*Cymbopogon martinii*	Slips/seeds
7.	*Cynodon dactylon*	Rhizome
8.	*Dactyloctenium aegyptium*	Seeds/slips
9.	*Eragrostis viscosa*	Slips
10.	*Heteropogon contortus*	Seeds
11.	*Macrotyloma uniflorum*	Seeds
12.	*Saccharum spontaneum*	Slips
13.	*Stylosanthes fruticosa*	Seeds
14.	*Stylosanthes hamata*	Seeds
15.	*Tephrosia purpurea*	Seeds
16.	*Themeda quadrivalvis*	Slips/seeds
17.	*Vetiveria zizanioides*	Slips/ seeds

Annexure-VI

Annual Expenditure Report

Sonepur Bazari Area						
S. No.	FY	Coal Production (in Te.)	Rs. 5 per tonne equivalent (in Rs.)	CSR Expenditure(in Rs.)	Medical Expenditure (CSR)	
1	2014-15	6406000	32030000	4400828	13.74 %	117657
2	2015-16	6202278	31011390	113639	0.37 %	51635
3	2016-17	8925012	44625060	3675583	8.24%	29902

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SB Area