Executive Summary

of

EIA & EMP

prepared for obtaining
Environmental Clearances
for
Cluster No. 5
(Group of Mines in Sodepur Area, ECL)

Eastern Coalfields Limited,

PO: Sanctoria, Dist: Burdwan (WB)

1.0   Need for Environmental Clearances for taken over Coal Mines

A large number of taken over mines from pre – nationalization period, mostly underground mines, in the old coalfields of Raniganj (including Mugma) are operating on the basis of "Consents' received from the State Pollution Control Boards and do not have environmental clearance from the Ministry of Environment & Forests. EC for such mines will be required at the time of lease renewal or at the time of expansion, if any. However, if these mines are brought under the ambit of EC, several measures for environmental protection and pollution control can be put in place. This assumes significant importance in the wake of Asansol being placed in the list of critically polluted areas of the country. Mining in this region has been going on for two centuries and a number of environmental problems related to mining and to the consequent industrialization of the area need to be addressed. Also, several proposals as envisaged for the cluster can be implemented only after obtaining the Environmental Clearance.

2.0   Concept of Clusters

There are a total number of 111 existing mines in ECL. The work of obtaining EC for each mine, individually, would take a lot of time. Since the environmental problems being faced are of regional nature and not confined to individual mines alone, it was proposed that cluster/groups of such mines may be identified for preparing cluster-wise integrated EIA & EMPs, addressing environmental concerns comprehensively and ensuring effective co-ordination of environmental control measures within each cluster. The matter was originally discussed between Secretary (Coal) and Secretary, MoEF on 28th February, 2008 and it was agreed to prepare EIA & EMPs for clusters of mines instead of individual mines to speed up the process. Accordingly, the mines were distributed into 13 clusters on the suggestions and directions given by MoEF during several rounds of discussions and was approved by MoEF in the EC meeting held in August, 2009. The EIA & EMP for Cluster No. 5 has been prepared on the basis of 'Terms of Reference' issued by MoEF vide letter nos. . J–11015/288/2010-IA.II (M) dated 03.12.2010 and J-11015/288/2010 -IA.II (M) dated 29.02.2012 (revised TOR).

3.0   Cluster No. 5 in brief

a.   <u>Location</u>

The mines of Cluster-5 are located in the south-western part of Raniganj Coalfields and south or right bank of the Damodar River in the Purulia District of West Bengal and are having lease boundaries adjacent to each other, The Cluster is located within Latitudes 23^0 38' N & 23^0 41' N and Longitudes 86^0 46' E & 86^0 51' E lying 100m to 140m above MSL.

The cluster includes the following villages–

<u>Purulia District</u>
1. Pochhyara
2. Nadiha
3. Gopalpur
4. Benipur
5. Ranipur Colliery
6. Sarbari
7. Pathardiha
8. Saltor
9. Deilya
10. Hirakhun
11. Bhamaria
12. Asanbani
13. Alkusha
14. Par Beliya (CT)
15. Parbelia
16. Kumradanga
17. Nawada
18. Hijuli (CT)
19. baghabatidh
20. Parsiodh
21. Gosaidanga
22. Khedadanga
23. Pothiara
24. Dubaswari
25. Harayanapur

26. Nimdanga

b.   Mines within the Cluster, Mine Leaseholds, Capacity and Life

The cluster consists of 2 (two) underground mines. Also, 2 (two) opencast patches have been proposed to be operated within the cluster. The mines are administratively under Sodepur Area of ECL.

The list of mines after incorporating the patches is tabulated as under –

Sl. No.	Name of Mine	Production Capacity (MTY)		Lease Hold Area (Ha)	Life of the mine
		Normative	Peak		
1.	Parbelia UG	0.15	0.19	2730	>25 years
2.	Parbelia OC Patch (Proposed)	0.1	0.13		1.5 years
3.	Dubeshwari UG	0.135	0.18	240	> 50 years
4.	Dubeshwari OC Patch (Proposed)	0.1	0.13		2.5 years
	Total	**0.485**	**0.63**	**2970**	

Note: Environmental Clearances for the mines is sought at their peak production capacities.

The registered addresses of the mines are given as under –

Sl #.	Name of Mine	Address
1	Parbelia UG + OC Patch (proposed)	
2	Dubeswari UG + OC Patch (proposed)	

c.   Production Scenarios for Environmental Impact Assessment (EIA)

The Environmental Impact assessment has been carried out for peak production levels under 3 scenarios as shown below –

Present Scenario (Only UG mines operating at present production levels, ie actual for 2011 - 12)	Future Scenario – 1 (after adding production from OC patches to A)		Future Scenario – 2 (OC patches are exhausted and UG mines producing at envisaged capacity	
A	B		C	
Actual 2012 – 13	Normative	Peak	Normative	Peak
0.147 MT	0.363 MTY	0.423 MTY	0.285 MTY	0.37 MTY
447 TPD	1160 TPD	1361 TPD	864 TPD	1121 TPD

d.   Area

Total area of Cluster No. 5 is 2970.0 Ha. Breakup of the various land-uses is tabulated as under –

Sl. No.	LAND USE	Area (Ha)	%
1	Infrastructure including Railway Siding	320.0	10.78
2	Tanks	117.0	3.94
3	Agriculture	1550.0	52.18
4	Danga	814.0	27.40
5	Village/Basti	120.0	4.05
6	Road	49.0	1.65
	TOTAL	2970.0	100

4.0 Present Environmental Scenario

Baseline data and other studies were carried out to assess the present environment conditions prevailing in the cluster. These included the following studies –

a.   <u>Landscape</u>

The landscape is rich in greenery and natural growth of trees and plants of several species. Settlements are few and located at significant distances apart. The area is largely one – crop agricultural area and the chief crop is Paddy. Water holding capacity of this soil increases with depth as well as with the increase of clay portions. Although the soil is generally not fit for cultivation, paddy can be grown in the areas which become waterlogged during the monsoons. The soil generally supports plantation with necessary additives and care.

b.   <u>Topography and Drainage</u>

The topography of the area is characterized by undulation and gently sloping surface towards river Damodar. The drainage is controlled by Damodar River which is the main drainage channel. Although there is no prominent stream or nallah within the leasehold, the area is drained by a number of ephemeral streams ultimately discharging into the Damodar River.

c.   <u>Climate</u>

The climate is tropical with hot dry summer, a good rainy season and cool winter. The area is characterized by humid to sub-humid conditions. During summer the hot spell prevails from March to middle of June. The area experiences great heat from April to June, when the maximum temperature crosses 45^0C. Thunder storms accompanied with severe squalls occur in pre-monsoon months. Dust storms also occur occasionally in April and May. Rainy season starts from middle of June to end to September. The area receives rainfall by South-West monsoon. Rainy season sets in the middle of June and lasts till September. The normal average rainfall is 1400 mm. Winter starts from the middle of November and continues till the end of February. December is the coldest month when the minimum temperatures fall down to as low as 1^0 C. Morning fog occurs in the winter months.

d.   <u>Flora & Fauna</u>

<u>Flora</u>

The general vegetation is essentially tropophilous but with a tendency towards xerophytes. The flora of the area is characterized by the arborescent species such as *Simul* (Salmalia malabarica Schott. & Endl.)*, Neem* (Azadirachta indica)*, Amlaki* (Phyllanthus embica)*, Lannea coromandelica* Merr., *Narikel* (cocos nucifera)*, Khejur* (Phoenix dactylifera L.)*, Tal* (Borassus flabellifer L.)*, Bat* (Ficus bengalensis L.)*, Asvattha* (Ficus religiosa L.)*, Palas* (Butea frondosa) *, Krishnachuda* (Caesalpinia Pulcherrima)*, Am* (Mangifera indica L.) and shrubby species such as *ashsheoda* (Glycosmis pentaphylla Corr.)*, Pianj, Rasun, Rajanigandha* (Polyanthes tuberosa Willd.)*, Ghentu* or *Bhat* (Clerodendron infortunatum Gaertn.)*, Kurabaka* (Barleria Cristata)*, Gulancha* (Tinospora cordifolia)*, Tulsi* (Ocimum sanctum)*, Solanum torvum SW., S. Verbascifolium L., Trema orientalis Bl., Shiora* (Streblus asper Lour.) and *Dumur* (Ficus hispida L.)*.

The uplands and the laterite area are in places covered with *Sal* (Shorea robusta Gaertn.)*, Mohua* (Madhnea latifolia),*Palas* (Butea monosperma)*, Bans* (Bambusa arundinacea)*, Shireesha* (Albizzia lebbek)*, Arka* (Calotropis gigantea)*, Kend* Diospyros melanoxylon)*, Arjun* (Terminalia Arjuna) *and Ashan* (T. tomentosa)*.* The common plants in hedges and wastelands are *lal-bharenda*(Jatropha gossypifolia L.)*, Ban-okra* (Urena lobata L.)*, Heliotropium strigosum Willd., Hati-soond* (H. indicum L.)*, Ulu*(Imperata arundinecea)*, Sida veronicifolia* Lam., *S.cordifolia* L., etc. (Source : District Website).

Trees of economic importance are to be found in abundance all around and these could be classified in three groups – fruit-bearing trees, trees for timber and fuel and flowering trees. Among fruit-bearing trees, Mango, Jacktree, date-palm, imli, plum (ber), Wood Apple (Angle mamelos), custard apple; Avla, Black plum and papaya are commonly found and jack fruit and mango are relatively in greater number. The timber trees are mostly Mahua (basis latifolia) Gamhar (genelina arborea), Asan (Terminalia tomentosa) Murga (Ptercarpus marsupium) , Shisham (Dahbergia sissso), Sal (Shorearobusta) , Bamboos (Dendrocalamus strictus) and the Margosa tree etc. Besides trees like Siris, Semar (Silk Cotton) and Sahjan (Morniga aneiphera) etc. are also available.

Low lands of the area are cultivated by Paddy, Maize, Arhar and Kulthi. Vegetables like Brinjal, Tomato, Potato, Chili, Bean (Sem), Jhinga, Parol are cultivated.

Fauna

The carnivora of the area comprise jackal and other smaller species. Monkeys abound including the variety known as Hanuman. Poisonous snakes include several kinds of cobra, karait and Russell's viper. Other most frequently seen varieties are the 'Dhamin' and various species of harmless grass snakes.

The avifauna are pea-fowl, jungle-fowl, jungle crow, house crow, treepie, common babbler, common jora, gold-fronted chloropsis, red-vented babul, red-whiskered bulbul, red spotted bluethroat, brown-backed robin, Shama, Tickell's blue flycatcher, paradise flycatcher, wood shrike, black drongo, tailor bird, streaked fantail warbler, golden oriole, common mayna, pied mayna, white-backed munia, white-throated munia, spitted munia, red munia, yellow-throated sparrow, house sparrow, woodpecker, India cuckoo, pied crested cuckoo, koel, parakeet, nilkantha, bee-eater, kingfisher, hornbill, hoopoe, horned owl, spotted owlet, jungle owlet, griffon vulture, long-billed vulture, scavenger vulture, lagger falcon, small spotted eagle, brahminy kite, pariah kite, sparrow hawk, various types of pigeon and dove, goose, duck, teal, lapwing, white necked stork and some varieties of egret and heron.

e.   Population profile within the Cluster

Demography

The cluster covers parts of the Purulia district. The demographic profile of the population within the cluster is tabulated as under –

Total Population (Person)	Total Population (Male)	Total Population (Female)	Child Population (0-6 years)	Schedule Caste	Schedule Tribe	Literates
33370	17386	15984	9660	9613	4752	10093
		934 per 1000 males	28.94	42.43 %	17.63 %	30.24 % Male: 37.44 % Female: 22.41 %

Data as per Census 2001

Employment & Occupation

The various occupations of the cluster population is summarized as under –

Total Worker	Non Worker
9727	23823

Main Worker	Main and Marginal Worker Cultivator	Main and Marginal Worker Agri-Labour	Main and Marginal Worker H.hold Indus.	Main and Marginal Worker Other Worker
6057	1114	1881	135	540

f.   Ambient Air Quality

Ambient air quality was studied by generating data for various air pollutants from 24 bi – weekly samples at 5 locations (2 in the core zone and 3 in the buffer zone) for the summer season (1st April to 23rd June, 2012). The monitoring stations were identified on the basis of meteorology in the upwind and downwind direction based on the available long term meteorological data on predominant wind direction and wind speed for the Asansol IMD Station with a purpose to represent the cross sectional scenario of the cluster. The predominant wind directions taken for this purpose was from South and South West. The monitoring stations were fixed at 500 m distance from dust generating sources. The methodology of baseline data generation was as per CPCB guidelines.

The concentrations of the following air pollutants were determined –

S.No.	Parameters
1	PM10
2	PM2.5
3	Sulphur di-oxide
4	Oxides of Nitrogen
5	Carbon–monoxide
6	Ammonia
7	Benzene
8	Benzo-pyrene
9	Heavy Metals

Core zone

PM_{10} and $PM_{2.5}$ values were ranging from 50 $\mu g/m^3$ to 69$\mu g/m^3$ and 15 $\mu g/m^3$ to 25$\mu g/m^3$ respectively. SO_2 and NO_x values were varying between 5.6 to 8.2 $\mu g/m^3$ and 18.8 to 23.3 $\mu g/m^3$ respectively. The ammonia was to found to be maximum extent of 25 $\mu g/m^3$. The Lead, Nickel and Chromium values were found to be maximum extent of 0.14$\mu g/m^3$, 0.06 and 0.08ng/m^3 respectively. Ozone (O_3), Carbon monoxide (CO), Benzo(a)Pyrene (BaP) and Benzene (C_6H_6) values were found to be below the detectable Limit, Heavy metals like Arsenic and Mercury values were found to be below the detectable Limit.

<u>Buffer zone</u>

PM_{10} and $PM_{2.5}$ values were ranging from 28 $\mu g/m^3$ to 56 $\mu g/m^3$ and 11 $\mu g/m^3$ to 18$\mu g/m^3$ respectively. SO_2 and NO_x values were varying between 5.0 to 7.9 $\mu g/m^3$ and 10.6 to 14.7 $\mu g/m^3$ respectively. The Lead, Nickel and Chromium values were found to be maximum extent of 0.04$\mu g/m^3$, 0.05 and 0.02ng/m^3 respectively. Ozone (O_3), Carbon monoxide (CO), Benzo(a)Pyrene (BaP) and Benzene (C_6H_6) values were found to be below the detectable Limit, Heavy metals like Arsenic and Mercury values were found to be below the detectable Limit.

Thus, the observed concentrations were mostly found to be within reasonable and permissible limits as per NAAQS (2009) or the standards for coal mines stipulated by MoEF for old coalfields.

g.   <u>Water Quality</u>

Water samples were collected and analyzed as per procedures outlined in IS-2488/ IS-3025 / AWWA / APHA. Sterilized bottles were used for collection of water sample for bacteriological analysis, stored in icebox and transported to the laboratory for the analysis. Parameters like pH, Temperature, Dissolved Oxygen, Residual Chlorine, Conductivity, Free Ammonia, Total Hardness, Calcium Hardness and Magnesium Hardness were analyzed in the field while collecting the samples. MPN index of coliforms are determined in the laboratory as per standard methods.The physico-chemical and bacteriological parameters for drinking/ground water were compared with IS:10500; inland surface water, mine & industrial effluents with GSR-742 (E).The water samples analysed for various parameters were compared with different relevant Indian Standards. The results of surface water samples and mine discharge samples were compared with IS 2296-Part C and GSR 742 (E) respectively. Results of ground water samples were compared with IS: 10500.

h.   <u>Groundwater levels & Hydrogeology</u>

Hydrogeological investigation for the cluster was carried out by the study of long term water level trends in 7 designated wells (hydrograph stations) spread over the core and buffer zone of the cluster. It was observed that the pre-monsoon water levels within the cluster show a rising trend for 2 wells out of 7 while 5 of the wells show a declining trend during post – monsoon.

However, all wells show a declining trend in the level of fluctuation between pre and post – monsoon levels which strongly confirms that there is no adverse impact of mining on the ground water levels in the cluster. Since all future mining in the cluster, except the few OC patches to be operated for a brief period, will be at even lower horizons, no adverse impact of mining is anticipated in the cluster.

It was estimated by water balance studies that there is surplus water available per annum from the ground water annual recharge after catering to the future requirement in the core zone and the discharges from the mines. The groundwater development for the cluster was determined to be 12.33 % which falls in the 'safe' category.

5.0 Environmental Impact Assessment

The EIA carried out for the cluster covered the aspects of impacts of mining within the cluster on Air Quality & Noise levels, Hydrology and Hydrogeology, Land & Soil Quality, Flora and Fauna and Socio – economic profile of the area.

6.0 Environmental Action Plan

Environmental Management System (EMS) refers to the management of an organization's environmental programmes in a systematic, planned and documented manner. It includes the organizational structure, planning and resources for developing, implementing and maintaining policy for environmental protection. The Environmental Action Plan for mining in this cluster has been prepared accordingly and the measures suggested will go a long way in improving the overall environmental scenario of the cluster especially in light of the area coming under the list of critically polluted industrial clusters of the country. The scope of environmental management includes plantation, surface drainage, industrial waste water treatment plant, subsidence monitoring, air, water and noise pollution check etc.

Objectives of the Environmental Action Plan

The EIA & EMP for the cluster has been prepared with the following objectives –
- ✓ Integrated efforts by mines for pollution control and monitoring.
- ✓ Rationalization of the coal transport system to reduce pollution due to truck movements.
- ✓ Effective solid waste management to achieve backfilling of OC voids

- ✓ Synchronization of rehabilitation measures for unstable locations with the Master plan for Raniganj Coalfield.
- ✓ Co-ordinated reclamation works.
- ✓ Meaningful CSR activity due to pooling of resources.
- ✓ To meet the water requirement of the community from mine water after filtration and treatment.
- ✓ Setting up of special environment management and monitoring cell for meeting the above objectives and to closely interact with the concerned SPCB and Forest Deptt. for achieving the set standards.

The above programme will be in keeping with the goals set out as per the CIL's **Corporate Policy for Environmental Management (2012)** as stated below –

Policy Statement

Coal India Ltd affirms its commitment for environment friendly mining with right mitigation of pollution, reclamation of the degraded land, preservation of biodiversity and proper disposal of waste following the best environmental practices including judicious use of the non-renewable energy on the path of continual improvement.

Objectives:

Coal India Ltd. shall endeavor to:

1. Conduct mining and associated operation in an environmentally responsible manner to comply with applicable laws and other requirements related to environmental aspects. Design projects with due consideration of sustainable development.
2. Prevent pollution of surrounding habitation by continuous monitoring and adopting suitable measures for environment protection.
3. Ensure compliance of all applicable EC conditions, FC conditions and other statutory conditions issued by regulatory agencies.
4. Implement EMP in all our mines effectively to mitigate pollutions on air, water and noise, reclamation of degraded land and proper disposal of wastes.
5. Strive to conserve Bio-Diversity.
6. Conserve natural resources through recycling of waste on the principle of REDUCE, RECYCLE and REUSE. Put special thrust on efficient energy utilization as a measure to reduce carbon foot-print.

7. Strive for continual improvement in environmental performance by setting targets, measuring progress and taking corrective action.

8. Create environmental awareness among employees and local communities through pro-active communication and training.

7.0 Environmental Monitoring & Control

Monitoring of environmental attributes is imperative for an effective environmental management of the cluster. It is proposed to carry out routine environmental monitoring of the cluster by setting up sampling stations for air, water, groundwater level & noise. The routine monitoring will be carried out as per the following guidelines –

Sl No	Environmental attribute to be monitored	No. of sampling stations	Type of monitoring	Frequency of monitoring	Follow-up Action
1	Ambient Air & Noise	3 to 4 stations in each mine and 1 station at the railway siding at 500m from dust generating sources (CHP, transport route, coal depot, etc) Total = 16 stations within the cluster (including 8 station at OC patches & 1 railway siding)	24 hrly sampling for PM10, PM2.5, SO_2, NO_X, CO & heavy metals dBA (Leq)	2 consecutive days in each quarter year. Heavy metals once every year Once during daytime at each station in each quarter	In case the concentrations are observed to be higher than the standards for RCF on both days, fortnightly monitoring will be carried out until corrective measures take effect.
2	Mine Discharge Water	As many as discharge points on surface Total = 4 samples within the cluster (including 2 samples of mine discharge at OC patches)	All parameters as per MoEF Schedule VI Standards	Once in each quarter year	Monitoring frequency will be increased in case any parameter is found in excess of discharge standards
3	Ground Water Level	5 no. of dugwells in each mine leasehold Total = 10 dugwells within the cluster	Level of water table below ground (unconfined aquifer)	Once in each season (Jan, April/ May, Aug & Nov)	Trends to be established and corrective action taken accordingly & report submitted to WBPCB
4	Ground water / potable water	Water samples from the 10 wells selected as above. Filtered water supplied to mines / colonies – 10 samples	All parameters as per IS 10500 – 1991 Standards	Once in May every year Once in each quarter	Corrective action with the help of experts in the field will be taken if any of the parameters is found exceeding the standards & report submitted to WBPCB
5	Surface water	1 sample from upstream of Damodar river and 1 sample from downstream of Damodar river (river is touching the boundary of the cluster) 2 more samples from the ponds in the cluster Total = 4 samples	All parameters as per IS 2296 Inland Surface Water Body(1982) Class 'C' Standards	Once in each quarter year	Efforts will be made to identify the source of pollutant will be made and corrective action with the help of experts in the field will be taken if any of the parameters is found exceeding the standards & report submitted to WBPCB

8.0   Conservation Measures for Water

The following conservation measures are being / will be adopted –

✓   The mine discharges are being effectively utilized to meet the domestic and industrial needs of the mines. Almost, the entire industrial and domestic water demand of the mines is being met from treated mine water.

✓   After cessation of mining, with plenty rainfall and abundant ground water recharge, the water levels will recoup and attain normalcy. Thus, the impact of mining on groundwater system may be considered as a temporary phenomenon. The abandoned mine workings also behave as water pool and improves the resources availability in the area.

✓   To increase the source availability, hand pumps and in some places piped water supply is being provided to nearby villages.

✓   The discharged mine water is also being gainfully utilized by the local people for irrigation and domestic use. Thus, the mine water from existing mines in the cluster and abandoned OC voids is a resource for local villages.

Future Strategy

✓ To assess the impact on local water levels, in time and space coordinates, a monitoring network of dug wells and/ piezometers in the zone of influence will be established and the water levels will be monitored quarterly (please refer monitoring schedule above).

✓ To create the water resources and to increase groundwater recharge in the nearby villages, under community development, hand pumps and tanks/ponds will be constructed or strengthened.

✓ Utilization of mine water for irrigation use will also enhance the ground water recharge potential through artificial recharge in the area.

✓ Increase in vegetative cover by plantation in the mine area under land amelioration measures will contain the surface run-off and increase the ground water recharge.

✓ The impact on ground water level will be minimized by artificial recharge by spreading of pumped out water, creation and filling of ponds with mine water and construction of rainwater harvesting structures. Creation of awareness among workers and local people about rain water harvesting and artificial recharge will be given priority. This aspect is usually covered during the Environmental Week celebrated every year (5 to 12 June).

- ✓ Rain water along with surplus mine pumping water will be discharged into local streams / nala after passing through the settling tank. Necessary earthen check dams will be made in the nala for recharging ground water aquifer. Rainwater harvesting and artificial recharge will also take place through abandoned dug-wells and final voids of old opencast mines for increasing ground water potential and check water level lowering.
- ✓ Utilization of treated mine water discharge by both industry and local people in the mine influence area.
- ✓ Monitoring of water quality of mine water discharge, local river/nala and domestic water source (dug well/hand pump wells) will be continued under routine monitoring (please refer monitoring schedule above).
- ✓ Suitable control and remedial measures would be adopted by the mine authorities in case of any adverse trends being noticed through regular monitoring.
- ✓ Any other measures recommended by the regulatory agencies from time to time will be implemented.

9.0 Conservation Measures for Land

The following conservation / reclamation measures for land will be taken –

Management of Old & proposed OC Voids & Dumps

a. The OC patches to be operated will be completely filled-up after exhaustion of reserves and reclaimed with plantation.

Management of Subsided Land

b. No further areas will be brought under subsidence. After completion of mining activities, the subsided areas will be graded and planted upon.

No further land Acquisition for mining

c. The cultivable land within the cluster will be left undisturbed and not diverted for mining purposes
d. The proposed OC patches fall in barren areas and no further OC mining is proposed than which have already been planned.

10.0 Progressive Landuses

The total area of the cluster is 2970.0 Ha. Present and proposed land use of this area is tabulated below –

Sl. No.	LAND USE	Present Land use (in Ha)	Post Mining Land use (in Ha)
1	Infrastructure area	320	200
2	Water Bodies	117	117
3	OB Dump and Quarry	0	0
4	Agriculture	1550	1550
5	Plantation	0	455.54
6	Barren Land	814	478.46
7	Village/Basti	120	120
8	Road	49	49
	TOTAL	2970	2970

The Post-mining land use of core zone with environment management and requirement of trees in tables prepared by MoEF are given in the following tables –

S No.	Description	Land-use (Ha)				
		Plantation	Water Body	Public use	Undisturbed	Total
1	Top-soil Dump	-				
3	Excavation	20.2	-	-	-	20.2
4	Rail /Road	-		49.0	-	49.0
6	Mine Infrastructure/ Built-up	120.0		200.0		320.0
	Village/Basti				120.0	120.0
7	Barren / Vacant land	315.34		-	478.46	793.8
8	Afforestation (200 ha) / Natural vegetation	-	-	-	-	-
10	Water bodies				117.0	117.0
11	Cultivable				1550.0	1550.0

| | | | Total | 455.54 | | 249.0 | 2265.46 | 2970.0 |

Ecology: Stage Wise Cumulative Plantation

REQUIREMENT OF PLANTS FOR AFFORESTATION/ RECLAMATION

Year	Subsided Area		Old External Dump		Reclaimed Quarry Area		Others		Total	
	Area (Ha)	Trees	Area (Ha)	Trees	Area (Ha)	Trees	Area (Ha)	Trees	Area (Ha)	Trees
Existing							-	-	-	-
Natural Vegetation							-	-	-	-
0 – 5 years					20.2	32320	-	-	20.2	32320
6 – 10 years							60.0	96000	60.0	96000
11 – 15 years							60.0	96000	60.0	96000
16 – 20 years							60.0	96000	60.0	96000
21 – 25 years							60.0	96000	60.0	96000
26 – 30 years							75.34	120544	75.34	120544
After 30 years							120.0	192000	120.0	192000
Total					20.2	32320	435.34	696544	455.54	728864

11.0   Corporate Social Responsibility

As part of its Corporate Social Responsibility (CSR) efforts, Coal India Limited and its subsidiary companies regularly undertake various community development activities in and around the coalfield areas for the benefit of the local people. A detailed cluster specific CSR plan has been made in the EMP and is given below in brief –

Works done under Community Development Programme are normally as under:-

- ✓ Installation/Repairing of Hand Pumps.
- ✓ Digging/renovation of Wells/Ponds/Dam etc.

- ✓ Water Supply through pipelines.
- ✓ Construction/Renovation and repair of Community Centre/building.
- ✓ Construction/repair of Roads/Culverts.
- ✓ Construction/repair of school building.
- ✓ Organising Medical Camps.
- ✓ Organising Sports and cultural activities.
- ✓ Misc works.

Provisions for CSR

Provisions for CSR under Community Development have been made @ Rs. 5.00 per tonne of coal produced. This works out to about Rs. 24.25 lakh per annum at 0.485 MTY of coal production` (present production from the cluster is only 0.162 MTY). The amount to be spent annually will be significant as the life of the mines is more than 25 years.