EXECUTIVE SUMMARY
of
Draft Environmental Impact Assessment & Environmental Management Plan Report

(Submitted for Public Hearing as per the provisions of
EIA Notification 2006 & amendments thereof)

For

EXPANSION OF COAL WASHERY
from 1.2 MTPA (Dry Process) to 3.6 MTPA
(By adding 2.4 MTPA through wet process)

(Project Area: 25.5 Ha)

Located at:
Near Sirgitti Railway Crossing, Sirgitti Industrial Area, Village Parsada, Tehsil Bilapur, District Bilaspur, State Chhattisgarh

Project Proponent:
Maheshwari Coal Benefication & Infrastructure Pvt. Ltd.
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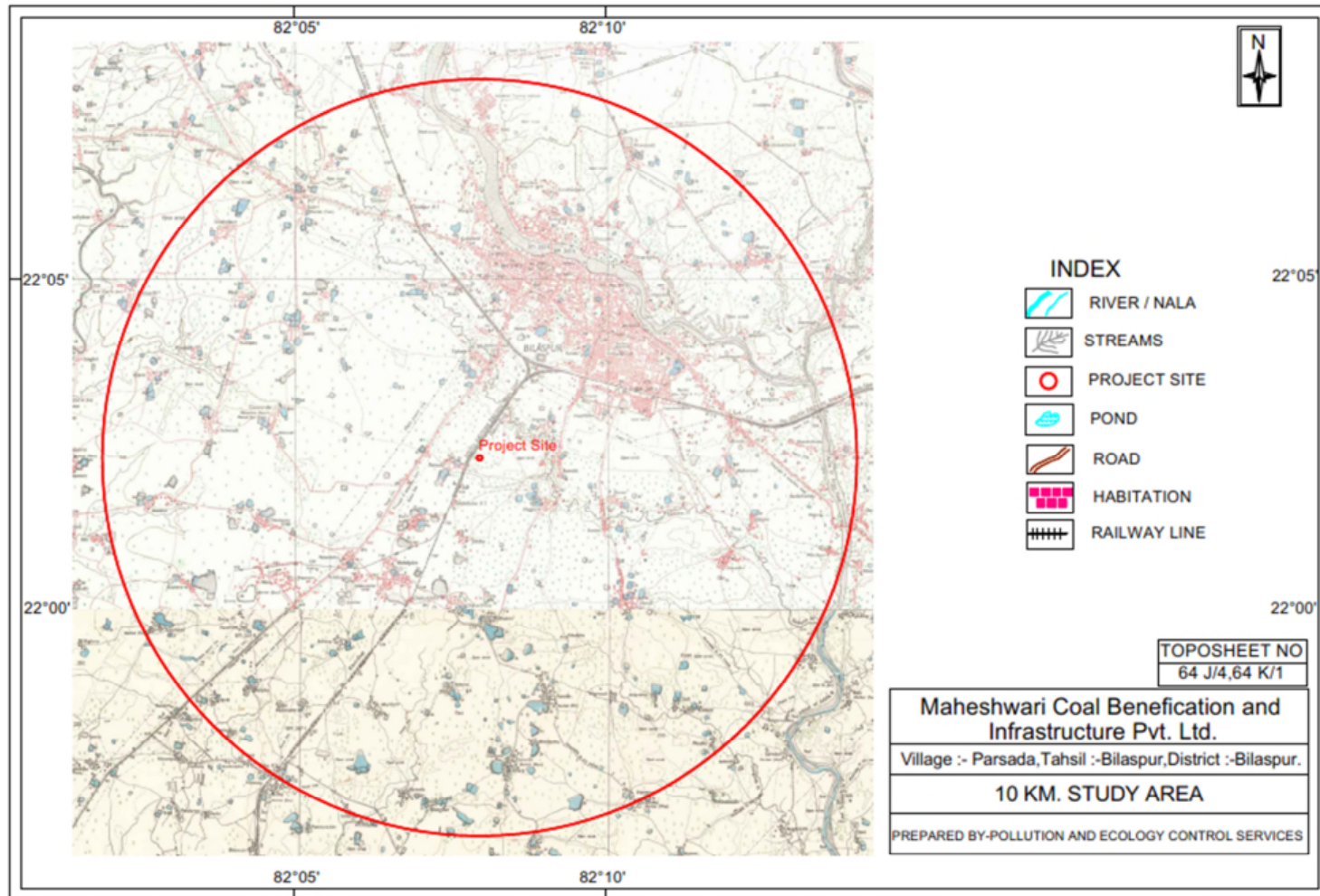## March 2018

EXECUTIVE SUMMARY

1.1   INTRODUCTION

M/s Maheshwari Coal Benefication & Infrastructure Pvt. Ltd. [hereinafter referred as MCBIPL] is a pioneer company in the field of Coal Washery Business. Maheshwari Coal Benefication & Infrastructure Pvt. Ltd keeping the company's philosophy of maintaining a healthy and clean environment in and around the industry, it has made environment management system an integral and fundamental part of the business. The company, promoted by Shri Anil Mundra, is engaged in various businesses. Maheshwari Coal Benefication & Infrastructure Pvt. Ltd. is operating a 1.2 MTPA dry coal washery at village Parsada, Near Sirgitti Railway Crossing, Sirgitti Industrial area, Bilaspur, CG. Looking forward in prospects of utilization of washed coal Maheshwari Coal Benefication & Infrastructure Pvt. Ltd. proposed to expand the existing 1.2 MTPA dry Coal Benefication capacity by installing a 2.4 MTPA wet Coal washery. Thus after installation of new coal washery, the total Coal Benefication capacity will be 3.6 MTPA.

1.1.1   Identification of Project

M/s Maheshwari Coal Benefication & Infrastructure Pvt. Ltd. is operating a 1.2MTPA capacity dry coal washery at Parsada Village, Near Sirgitti Railway Crossing, Sirgitti Industrial Areas, Tehsil & District- Bilaspur (Chhattisgarh). Environmental Clearance is granted to existing 1.2 MTPA dry coal washery vide letter no. J-11015/950/2007-IA.II(M) Dated 18th March 2009**.** Now, M/s MCBIPL has proposed expansion of its existing 1.2 MTPA Dry Coal Washery to 3.6 MTPA Coal Washery by installing a new 2.4 MTPA Wet Coal Washery. The company has identified an additional area of 6.48 Ha adjacent to the existing washery for the proposed expansion of project. Thus total area of the project now comes to 25.5 Ha. The capital cost of the proposed expansion of coal washery project is estimated to be Approx. **Rs. 19 Crore.**

1.1.2   Location of the Project

The proposed coal washery area will be located in Khasra Nos.: 699, 699/1, 706/1,2; 707/1,2,3,5; 709/1,2,3,4,5,6,7,8,9,10,11; 729/1,2,3; 743/1,2,4; 745 in Village – Parsada, Near Sirgitti Railway Crossing, Sirgitti Industrial Areas, Tehsil & Dist.- Bilaspur (Chhattisgarh). The project area and 10 km radius study area falls in Toposheet no. 64-J/4 & 64-K/1 on R.F. 1:50,000. The project falls within Latitude: 22°02' 17.6" N to 22° 02' 33.3" N and Longitudes 82°07' 40.0" E to 82°08' 14.0" E. Topographical map of the 10 km radius study area of the project is given in **Figure 1.1.**

Executive summary of Draft EIA/EMP for Proposed Coal Washery expansion (1.2 MTPA to 3.6 MTPA) at Parsada Village, Sirgitti Industrial Areas, Tehsil & District- Bilaspur, Chhattisgarh

M/s. Maheshwari Coal Benefication & Infrastructure Pvt. Ltd.

FIGURE 1.1: TOPO MAP OF STUDY AREA (10 KM RADIUS)

1.2   Draft EIA/EMP Report

Proposed coal washery expansion project of M/s Maheshwari Coal Benefication & Infrastructure Pvt. Ltd. is classified as "Category A" as per the EIA notification dated on 14th September, 2006. Baseline environmental monitoring was conducted in line with the ToR during Summer 2017 i.e. March 2017 to May 2017 for determining the status of ambient air quality, ambient noise levels, surface and groundwater quality, soil quality, status of flora, fauna and eco-sensitive areas and socio-economic status of the villages within 10 km radius study area. The observations of the studies are incorporated in the draft EIA/EMP report. Impacts of the proposed project activities during construction and operation stages were identified and duly addressed in the draft EIA/EMP report alongwith the proposed management plan to control / mitigate the impacts. Environmental Management Plan is suggested to implement the pollution control measures in the project.

Table 1.1: Salient Features of the Project Site

Sr. No.	Particulars	Details
1	Location	Parsada Village, Near Sirgitti Railway Crossing, Sirgitti Industrial Areas, Tehsil & District- Bilaspur (Chhattisgarh)
2	Khasra No.	699, 699/1; 706/1,2; 707/1,2,3,5; 709/1,2,3,4,5,6,7,8,9,10,11; 729/1,2,3;743/1,2,4;745
3	Total area & present landuse	Additional area of 6.48 Ha (Total area of the project now comes to 25.5 Ha) Land use: Industrial area
4	Site elevation	270 to 271 m MSL
5	SoI Toposheet No.	64-J/4 &64-K/1
6	Nearest IMD station	Bilaspur
7	Site topography	Flat
8	Nearest highway	Bilaspur - Raipur NH 130 (1.2 Km, NW) Bilaspur - Champa NH 200 (5.0 Km, NE)
9	Nearest railway station	Dadhapara Railway Station 1.2 Km, S Bilaspur Railway Station 3.60 Km, NE
10	Nearest airport	Bilaspur Airport : 5.3 Km, S Raipur Airport ~105 Km, S
11	Nearest rivers	Arpa River~ 5.0 Km NE Kharang River: 8.5 km NE
12	Nearest port	None within 10 km radius
13	Nearest town	Bilaspur, 2.5 Km N
14	District headquarters	Bilaspur, 2.5 Km N
15	Nearest state/national	None within 10 km radius

Sr. No.	Particulars	Details
	boundaries	
16	Nearest major city with 2,00,000 population	Bilaspur, 2.5 Km N
17	Nearest village	Parsada, 0.2 km SW
18	Nearest tourist place	None within 10 km radius
19	Archaeological sites	None within 10 km radius
20	Protected areas as per wildlife protection act 1972 (tiger reverses, elephant reserve, biospheres, national parks wildlife sanctuaries, community reserves & conservation reserves)	None within 10 km radius area
21	Reserved/protected forests	None within 10 km radius
22	Seismicity	Seismic Zone II (Low Damage Risk Zone: MSK VI or Less)
23	Defence Installations	None within 10 km radius area
24	Other industries in 10 km radius	Chhattisgarh Power & Beneficiation Ltd (1 Km, N), Maa Mahamaya Steel Pvt. Ltd (1 Km, SE), Jai Durga Oil Extraction (2 Km, NE), Black Diamond Motors (1.5 Km, N), Pawan Industries (3 Km, NW), Vandana Vidyut Ltd. (4 Km, SE), Golden Prince Wine Pvt. Ltd. (1 Km, N), NDPL Steel (1.5 Km, E), Salasar Air Product (4 Km, SE)

1.3   PROJECT DESCRIPTION

1.3.1 Process Description

The proposed coal washery will be a Heavy Media Bath based coal beneficiation unit. The proposed coal washery has been divided into three sections:
   a. **Pre-washing Unit:** A dry crusher circuit which can be called as the pre-washing circuit.
   b. **Coarse Coal Circuit:** A Heavy Media Coarse Coal circuit which Consists of Heavy Media Cyclone and a Bank of Clean Coal Screens and Reject Coal Screen.
   c. **Fine coal Circuit:** A Fine Coal Circuit which consists of Sets of classifying cyclones and Hi- Frequency Fines De-Watering Screens.
   d. The Washery will provide Hi-Rate Thickener and Filter Press.

In the first section of the screen (drain section) the magnetic slurry will be drained to the heavy media sump. In the second section of the screen (rinse

section) water jets will be used to wash the coal with magnetite sticking to its body. The rinse water from both the screens will be collected in the Dilute Media Sump from where it will be pumped into the wet drum magnetic separators. The effluent from magnetic separator will be taken to the effluent treatment plant and will be used for complete recycle of washery process water.

The coal reject from the reject screens will be discharged over the reject coal belt for suitable stockpiling. The washed coal will be discharged over the washed coal conveyor where the washed coal will be blended with raw bypass coal (optional) in a predetermined ratio to give final ash content as required by the end user. The product on conveyor will be carried to a washed coal bunker. Coal dust will be collected from belt press as well as pulse jet bag filters which will be utilized in small capacity captive TPP based on CFBC Boilers and brick kiln of the area along with coal rejects.

An online belt weigher and automatic ash analyzer are also proposed in both raw coal feed belt and washed coal belt. The plant will be operated through PLC and as and when required will be put on auto control.

1.3.2 Raw Coal Requirement, Source & Mode of Transport

This is a case of proposed Expansion of 1.2 MTPA Dry Coal Washery to 3.6 MTPA Coal Washery by installing new 2.4 MTPA Wet Coal Washery at Parsada Village, Near Sirgitti Railway Crossing, Sirgitti Industrial Areas, Tehsil & District- Bilaspur. Coal will be the only raw material required for proposed washery. Annual requirement of Coal after expansion is envisages to the tune of 3.6 MTPA. Desired quantum of coal Raw Coal shall be transported by rail from nearby SECL area preferably from Dipka/ Gevra/Kusumunda/Chal/Korba/Raigarh etc.

The washed coal will be transported through rail route from existing own siding and tarpaulin covered trucks, to industries where rail facilities does not exists. Rejected coal will be transported trough truck or rail to the power and cement plant.

1.3.3 Solid waste generation & Management

It is proposed to process 2.4 MTPA raw coal in the proposed coal washery. About 20% of raw coal i.e. 4,80,000 TPA washery reject coal will be generated from the proposed coal washery. M/s Maheshwari Coal Benefication & Infrastructure Pvt. Ltd. will utilise the reject for coal blending and remaing if any will be supplied CBFC power plants or brick kilns.

1.3.4 Water Requirement & Source
Total water requirement for the proposed 2.4 MTPA wet coal washery is estimated to be 8,230 m^3/d. Out of this, 7,787 m^3/d water will be recycled and reused in the process and only

443 m³/d water will be supplied from outside. Permission for drawal of ground water will be obtained from CGWB.

1.3.5 Manpower Requirement

During the construction phase work will be generated for skilled, semiskilled and unskilled labors. Technical persons will be recruited during the operation phase. The project creates employment to about 150 person once the plan comes to the operational stage and for 70 people during construction stage.

1.3.6 Site Infrastructure

The coal washery is Parsada Village, Near Sirgitti Railway Crossing, Sirgitti Industrial Areas, Tehsil & District- Bilaspur (Chhattisgarh). Preference in employment will be given to local people. Hence, there is no need for provision of township. For efficient plant operation, infrastructure facilities like office, store, rest area, drinking water facilities, urinals, latrines, canteen, first aid centre, etc will be made available within the plant premises. Internal black topped (tarry) roads will be developed. An ambulance facility will be kept ready to attend any medical emergency occurred during construction and plant operation phase.

1.4   EXISTING ENVIRONMENTAL SCENARIO

1.4.1 Baseline Environmental Studies

Baseline environmental studies were carried out within 10 km radius of the proposed coal washery expansion project area to assess the existing environmental scenario in the area. For the purpose of EIA studies, project area (existing and proposed coal washery area) was considered as the core zone and area outside the coal washery upto 10 km radius was considered as buffer zone. The baseline environmental monitoring for various components of environment, viz. Air, Noise, Water, Land, soil, ecology was carried out during summer season i.e. **March to May 2017** in the study area covering 10 km radial distance from the coal washery area. Other environmental data on flora and fauna, land-use pattern, forests, socio-economic status, etc. were also generated through field surveys and secondary information collected from different state Govt. departments.

1.4.2   Meteorology & Ambient Air Quality

Summary of Site Specific Meteorological data

Temperature (°C)	18.6°C to 42.5°C
Relative Humidity (%)	20% to 55%
Predominant Wind Direction	SW (16.53%)
Average wind speed	1.56 m/s
Calm wind %	48.05%

Ambient Air Quality Status

The status of ambient air quality within the study area was monitored for Summer season during March to May 2017 at 8 locations including the proposed coal washery area and in nearby villages. The sampling locations were selected based on the meteorological conditions considering upwind and downwind directions. The levels of Respirable Particulate Matter (PM_{10}), Fine Particulates ($PM_{2.5}$), Sulphur Dioxide (SO_2,) and Oxides of Nitrogen (NO_X) were monitored. The minimum and maximum values of monitoring results are summarized in **Table 1.2**.

Table 1.2: Summary of Ambient Air Quality Monitoring Results

Station code	Location	Description	PM10, (µg/m³)	PM2.5, (µg/m³)	SO2 (µg/m³)	NOx (µg/m³)
AAQ1	Project Site	Minimum	54.9	30.5	14.0	23.8
		Maximum	64.5	35.8	21.4	36.4
AAQ2	Parsada	Minimum	42.3	26.9	9.3	15.5
		Maximum	53.7	32.3	14.4	24.2
AAQ 3	Chichirda	Minimum	42.7	22.2	7.4	12.1
		Maximum	55.4	28.3	15.0	22.7
AAQ 4	Chakarbhata	Minimum	51.1	27.7	14.9	21.8
		Maximum	61.4	33.2	21.6	34.5
AAQ 5	Bilaspur	Minimum	60.4	36.2	19.1	29.8
		Maximum	70.7	45.8	24.1	38.4
AAQ 6	Lalkhadan	Minimum	43.9	24.4	11.1	21.1
		Maximum	54.2	30.1	16.2	30.8
AAQ 7	Ameri	Minimum	42.3	28.7	13.0	19.5
		Maximum	51.9	33.5	15.2	26.3
AAQ 8	Mopka	Minimum	41.2	23.1	9.6	14.3
		Maximum	53.7	32.8	16.5	28.4
NAAQ Standard			**100 (24 hrs)**	**60 (24 hrs)**	**80 (24 hrs)**	**80 (24 hrs)**

From the above results, it is observed that the ambient air quality with respect to PM_{10}, $PM_{2.5}$, SO_2 and NOx at all the monitoring locations was within the permissible limits.

1.4.3 Ambient Noise Levels

Ambient noise level monitoring was carried out at the 8 monitoring locations, those were selected for ambient air quality monitoring. The monitoring results are given in **Table 1.3.**

Table 1.3: Summary of Ambient Noise Level Monitoring Results

Station Code	Location	Range		Ld	Ln	Ldn
		Minimum	Maximum			
N1	Project site	38.5	48.8	44.73	39.71	47.30
N 2	Parsada village	37.6	47.9	44.19	39.36	46.90
N 3	Chichirda village	38.4	44.0	42.31	39.37	46.30
N 4	Chakarbhata village	38.7	47.0	44.41	39.92	47.30
N 5	Bilaspur city	36.9	52.3	49.12	42.64	50.80
N 6	Lalkhadan village	38.8	47.6	43.92	40.29	47.40
N 7	Ameri village	39.7	45.6	43.03	41.46	48.10
N 8	Mopka village	39.1	48.8	45.68	40.85	48.40

1.4.4 Surface and Ground Water Resources & Quality

Water Resources

The project is located in Sirgitti Industrial area. The area falls in 'Industrial' category. The area is flat with general elevation of 270m to 271m above MSL. The study area around the project site is almost flat with elevation varying from 254 m to 275 m MSL. The general slope of the area is towards east. There is no hillock in the study area. Bilaspur city is located in northern part of the study area. Arpa river and Gokena nala forms the major drainage of the study area. Arpa river (4.9 km NE) flows from north to south- east and joins Kurung river after Bilaspur at about 8.4 km NE of the project area. After confluence, the river is known as Arna or Arpa river. Gokena nala (0.3 km N) is a perennial surface water body in the study area. Apart from these, there are some seasonal streams flowing in the study area. Also, there are a number of village ponds in the study area of the project.

The project site is located in Bilaspur tehsil of Bilaspur District. The formation exposed in site location comprises of sequence of Cherty shale and dolomite which comes under Tarenga Formation. The elevation observed at location is about 270m to 271m. The depth to water level observed in the area ranged from 2m to 5m bgl during Pre-monsoon as well as in Post-monsoon season. Most of the wells have a rise in water level in the range of more than 4 m. The entire Belha Block falls in 'Semi-critical' category of ground water development as stage of ground water development is 89.19% , which is more than specified limit of 70%.

Water Quality

The existing status of groundwater and surface water quality was assessed by identifying 5 ground water (Bore wells) locations in different villages and 3 surface water samples.

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M/s. Maheshwari Coal Benefication & Infrastructure Pvt. Ltd.

A. Groundwater Quality

The pH of the water samples collected ranged from 7.9 to 8.1 and within the acceptable limit of 6.5 to 8.5. The total dissolved solids were found in the range of 393 - 2037 mg/l and is exceeding the acceptable limit at 3 locations and exceeding permissible limit at 1 location. The total hardness varied between 212 - 868 mg/l and is observed to exceed acceptable limit at 2 locations and exceeding permissible limits at 2 locations.

In all samples, iron content varied in between <0.02 - 0.1 mg/l, Nitrate in between 1.6 – 13.1 mg/l, fluoride varied between 0.2 - 0.3 mg/l, chloride 53.6 – 311.7 mg/l, Sulphate 94.4 – 458.0 mg/l, alkalinity 166 - 288 mg/l, calcium 49.6 – 206.4 mg/l and magnesium in between 21.1 – 164.2 mg/l. The overall ground water quality was found to be mineralized with respect to TDS, hardness, calcium, magnesium, chloride, sulphate with moderate buffering capacity. The levels of heavy metals content were found to be within permissible limits. Coliform organisms are observed to be less than 3 MPN/100 ml. Thus, the ground water is required can be used for drinking and domestic use after necessary primary treatment, softening and disinfection.

B. Surface Water Quality

The pH of the surface water samples collected was 7.9 to 8.7 and within the acceptable limit of 6.5 to 8.5. The total dissolved solids were found in the range of 356 - 982 mg/l and are exceeding the acceptable limit at 2 locations. The total hardness varied between 60 - 504 mg/l and is observed to exceed acceptable limit at 2 locations. In all samples, iron content varied in between 0.09 - 0.22 mg/l, Nitrate in between 0.1 – 1.0 mg/l, fluoride varied between 0.2 - 0.3 mg/l, chloride 31.8 – 357.3 mg/l, Sulphate 88.8 – 237.2 mg/l, alkalinity 100 - 340 mg/l, calcium 12.8 – 92.8 mg/l and magnesium in between 6.7 – 65.3 mg/l in all samples. It was observed from the analysis that, the physico-chemical characteristics of the surface water samples are exceeding the acceptable limits for many parameters for samples collected from Pond near Kormi village and Arpa River but most of the parameters are within the permissible limits of drinking water standards. Coliform organisms are observed in all the samples. Thus, the water from all these can be used for drinking & domestic use after proper primary treatment and disinfection.

1.4.5   Land use Land Cover classification

Satellite imagery for the 10 km radius study area of the project was obtained and studied for identifying the different land use land cover patterns. Survey of India toposheets were also used to corelate with the satellite imagery. Based on the standard land use land cover classification, area covered in different categories was calculated. The Land Cover classes and their coverage are summarized in **Table 1.4.**

Table 1.4: LU/LC classes and their coverage within 10 km radius

Sr. No.	LU/LC Class	Area (Sq. Km)	Percentage (%)
1	**Built up Land Rural/Urban)**		
	– Settlement	57.56	16.83
	– Industry/other industries	7.58	2.22

Sr. No.	LU/LC Class	Area (Sq. Km)	Percentage (%)
	– Road Infrastructure	6.57	1.92
	– Railway Line/Railway Siding	2.26	0.66
2	**Agriculture Land**		
	– Cropland/Current Fallow Land	210.13	61.44
3	**Water bodies**		
	– River/Nala/Stream	6.48	1.89
	– Pond/Tank	2.26	0.66
4	**Scrub/Waste Land**		0.00
	– Land with scrub/Open Scrub	37.56	10.98
5	**Forest**		
	– Open Mixed Jungle	5.2	1.52
	– Forest Plantation	6.4	1.87
	Total	**342**	**100.00**

1.4.6 Soil Quality

For studying soil profile of the region, sampling locations were selected to assess the existing soil conditions in and around the proposed project site representing various land use conditions. The physical, chemical properties and heavy metals concentrations were determined. The samples were collected by ramming a core-cutter into the soil up to a depth of 15-20 cm. Total 3 samples within the study area were collected and analyzed.

From the analysis results of the soil samples, it was observed that the soil was low to medium fertile and having low productivity. The soil in the study area needs additional fertilizers for improving the fertility status and increase in crop productivity. Overall the soil quality in the area was found to poor to medium fertile with moderate productivity.

1.4.7 Biological Environment

Flora in the core & Buffer Zone

The project site comprise of existing coal washery and coal stack yard along with some patches of single crop agriculture land. There are existing greenbelt plantation along the boundary of the project. The project site is surrounded by agriculture land and other industries. There is no major vegetation located around the project. Few trees are observed in the agriculture lands dominated, by *Acacia nilotica, Butia monosperma, Azadirachta indica* and *Pongamia pinnata*.

On the basis of distribution of flora and fauna, the study area is demarcated into crop land, terrestrial vegetation, forest land, and aquatic vegetation. There is no thick vegetation cover in core zone. Dry and deciduous type of vegetation was seen in the buffer zone. Growth of gasses in the study area is more in rainy season; apart from rainy season study area looks like

dry and shady. Study area contains barren patches and scrub vegetation. The predominant tree species in the core zone are *Azadirachta indica, Mangifera indica, Pongamia pinnata, Acacia auriculiformis, Butea monosperma, Cassia simea etc*.

In village surroundings, *Albizzia marginata*, *Acacia catechu, A.odoratissima, Dalbergia sissoo, Acacia araculiformis, Tamirindus indica* (Emli), and *Azadirictha indica*(Neem) were common tree species. *Acacia catechu, Acacia nilotica, Dalbergia sissoo, Tectona grandis, Pongamia pinnata and Lucena leucocephala* are dominant species among the road side flora. In rural areas *Mangifera indica* (Mango), *Ziziphus jujuba*(Ber), *Tamirindus indica* (Emli), *Azadirictha indica*(Neem) and *Albizzia odoratissima* (Chichuva) are economic important trees of the study area.

Dominant species of herbs are *Datura alba, Ipomoea fistulosa* and *Parthenium histerophorus. Vitex nigundo, Lantena camera, Ficus hispida* and *Calotropis procera* have been observed as highly dense shrubs rather than others. Many of the herbs were seen as weeds in cultivated lands. Some of herbs and shrubs have been growing in wet lands and village grazing lands. The plant species *Lantana camera* and *Calotropis procera* are the dominant species of Railway track species.

Fauna in the core & Buffer zone
Since the core zone comprise of existing 1.2 MTPA coal washery project and the project site is located within Sirgitti Industrial area comprising of a number of industries located surrounding the coal washery project, there is no wild animals observed within or in the vicinity of the project site. Fauna observed in the project site comprise of common small animals such as Five striped squirrel (*),* Field rat (*Bandicota bengalensis),* Common house rat (*Rattus rattus),* common grey mongoose (*Herpestes edwardsi*), and birds like Blue rock piegeon, House crow, Pariah kite, Myna, Red vented bulbul, Koel, etc.

The mammals observed in the study area includes Large bandicoot Rat, Three striped squirrel, Five striped squirrel, Indian bush rat, Indian grey mongoose, Indian hare, Indian field mouse, Mouse, Hanuman Langur, Common Indian rat, House shrew. The reptiles observed in the study area include Garden Lizard, Lizard, Krait and Viper. Birds observed in the study area includes Common Kite, Grey quail, Jungle crow, House crow, White browed Bulbul, Indian robin, Rock Pigeon, Magpie Robin , Common wood shrike, Black Drongo, Grey Drongo, Indian Oriole, Brahmny Myna, Common Myna , Weaver bird, House Sparrow, Hirundo daurica, Grey wagtail, Loten's sunbird, Purple Sunbird, Indian Cuckoo , Common Hawk, Koel, Crow Pheasant, Rose ringed parakeet, Common kingfisher, House swift , Palm swift, Barm Owl, Marsh harrier, Shikra , Emerald Dove , Darter, Little Egret, Cattle Egret, Common Teal, White eyed Pochard, Moore hen, Indian River Tern, etc. There is no schedule I fauna observed in the study area of the project.

1.4.8 Socio-economic Environment

Information on socio-demographic status and the trends of the communities in the 10 km radius, was collected through primary social survey and secondary data from census 2011. Summary of the socio-economic status of the study area is given in **Table 1.5.**

Table 1.5: Summary of Socio-economic Environment of villages within 10 km radius area

Particulars	Numbers	%
No. of villages	44	
No. of Household	1,06,567	
Total Population	5,08,669	
Total Male	2,61,484	51.4%
Total Female	2,47,185	48.6%
Population SC	85,165	16.7%
Population ST	31,382	6.2%
Total Literate	3,75,059	73.7%
Male Literate	2,06,852	40.7%
Female Literate	1,68,207	33.0%
Total workers	1,82,536	35.89%
Total main workers	1,60,697	88.03%
Cultivators	8,823	5.49%
Agriculture Labors	13,025	8.11%
Household Industries	3,530	2.20%
Other workers	1,35,319	84.21%
Total Marginal Workers	21,839	11.96%
Total Non workers	3,26,133	64.11%

1.5 Anticipated Environmental Impacts and Mitigation Measures

1.5.1 Identified Impacts during construction phase and proposed mitigation measures

Ambient Air Quality

During construction phase, dust will be the main pollutant, which will be generated from the site development activities and vehicular movement on the road. Further, concentration of NOx and CO may also slightly increase due to increased vehicular traffic. Sprinkling of water at regular intervals preferably using truck-mounted sprinklers along the roads and work zone areas will be carried out to control fugitive dust emissions.

Water resources and Quality

There is no surface water stream within the proposed project site. There will not be any process wastewater generation during the construction phase. The surface run-off during rainy season from the broken up areas containing silt wash off may be carried to the seasonal

steams flowing outside the project area. Wastewater generation during the construction period will be from domestic effluent from the sanitation facilities provided for the workers. The earth work (cutting and filling) will be avoided during rainy season. In-plant roads will be concreted/blacktopped. Soil binding and fast growing vegetation will be grown within the plant premises to arrest the soil erosion. Septic tanks and soak pits will be constructed during for disposal of domestic effluent.

Ambient Noise Levels

The major sources of noise during the construction phase are vehicular traffic, construction equipment like dozers, scrapers, concrete mixers, cranes, pumps, compressors, pneumatic tools, saws, vibrators etc. Equipment will be maintained appropriately to keep the noise level within 85 dB(A). Wherever possible, equipment will be provided with silencers and mufflers. Acoustic enclosures will be provided to stationary machines like DG Sets, wherever possible. High noise generating construction activities will be restricted to day time only. Greenbelt will be developed from construction stage. Further, workers working in high noise areas will be provided with necessary protective devices e.g. ear plug, ear-muffs etc.

Ecology & Land environment

Proposed site of the 2.4 MTPA coal washery is located at uncultivated land surrounded by some agriculture fields. The majority of local vegetation in project site is of seasonal shrubs, herbs and grasses and naturally grown predominant plant species along the hedges of agriculture land like *Acacia nilotica (Babool), Butia monosperma (Palash), Azadirachta indica (Neem), Ailanthus excelsa(Maharukh)* and *Tamarindus indica (Imli),* etc. No tree cutting is planned. Plant design will be made such that the existing trees will be protected as it is. Development of green belt around the periphery of the project site and along the approach road will be taken up during construction phase.

1.5.2 Identified Impacts during Operation phase and proposed mitigation measures

1.5.2.1 Ambient Air Quality

Impacts on Air Quality

Ambient air quality modeling was carried out to assess the impacts on air quality due to expansion of coal washery project of M/s MCBIPL. FDM Model was used for assessing air pollution load from washery operations.

The predicted worst-case incremental GLC (24-hour average) of PM10 due to operations at coal washery, as predicted by FDM model, was **0.20 μg/m^3** and that for PM2.5 was predicted as **0.12 μg/m^3** .

From the observations of modeling results, it is observed that the predicted concentrations of PM10 & PM2.5 in the study area will remain within the permissible limits after establishment of the coal washery expansion project.

Air Pollution Control Measures
- Minimise transport of coal through trucks by maximum use of dedicated railway siding.
- Coal transport by trucks covered with tarpaulin sheets, where rail network does not exist.
- Concreting/blacktopping of internal roads to avoid generation of dust.
- Plantation of tall trees with thick folliage ;
- Continuous water sprinkling will be applied to cover railway wagons width during unloading.
- Provision of fixed water sprinklers at loading / unloading site within the plant.
- Provision of bag filters of adequate capacity for coal crushers.
- Provision of dust extraction / water sprinkling arrangement at all transfer points.
- Use of existing 100 KW solar power generating unit to reduce dependence on grid power and usage of DG Sets during grid power outages.
- Periodic monitoring of ambient air quality in plant premises and in nearby villages.

1.5.2.2 Ambient Noise Levels

For predicting the impacts on ambient noise levels, 'DHWANI' Noise model, developed by NEERI was used. From the modeling results, it was observed that the resultant noise levels at the plant boundary will be about 55 dB(A), which will further reduce over short distance. The resultant noise levels due to plant operations at the nearest habitation i.e. Parasada village was about 45 dB(A). Similarly, the resultant ambient noise levels at Sirgitti village was observed to be about 40 dB(A). Thus, it can be seen that no significant impact will take place on the ambient noise levels due to the coal washery expansion project operations.

Proposed Noise Control Measures

- Provision of noise attenuation measures during Design and layout of building;
- Use of lagging with attenuation properties on plant components / installation of sound attenuation panels around the equipment;
- Provision of acoustic enclosures to stationary equipment like crushers & screens, DG sets, etc.;
- Periodic maintenance of equipment and machinery;
- Provision of ear muffs/ear plugs to workers exposed to high noise generating areas;
- Job rotation for workers working in high noise generating areas;
- Development of thick green belt around plant boundary and within plant premises;
- Regulating speed of transportation vehicles to below 40 KMPH;
- Periodical monitoring of noise in the plant premises and in nearby villages;

1.5.2.3   Water Resources & Quality

Impact on Water Resources & Quality

There is no surface water stream flowing within the applied project site or adjacent to the project site. A seasonal nallah flows at 0.3 km S of the plant site. At present, the surface run-off from the applied project area flows along the natural slope of the area and joins seasonal streams flowing outside the project site. About 443 m^3/day make up water is required for industrial and domestic purposes during the operation phase of the proposed coal washery project. The source of water will be from ground water. NOC from CGWA is obtained for existing washery vide letter no. 21-4(71)/SEC/CGWA/2008-1033. Water permission will be obtained for additional water requirement. Applied project area falls in semi-critical zone for ground water drawal.

The potential sources of wastewater / effluent generation in the proposed coal washery project are Storm water run-off carrying coal particles & silt, Coal washery effluent and domestic effluent from plant premises. These effluents / wastewater, if discharged to environment (surface streams / land), will not only increase the plant water requirement, but will also cause significant pollution of the receiving water bodies / land surfaces.

Proposed Water Conservation & Water Pollution Control Measures

M/s Maheshwari Coal Benefication & Infrastructure Pvt. Ltd. will implement 'Zero Effluent Discharge' system. Entire waste water after treatment will be re circulated in process by close circuit system. For domestic waste water treatment, package type of STP is proposed. This will drastically reduce the fresh water requirement in the plant and will also protect the water quality of surface water resources flowing outside the plant area.

M/s Maheshwari Coal Benefication & Infrastructure Pvt. Ltd. will also implement rainwater harvesting measures in the plant premises. This will involve collection of the storm water

run-off from the plant premises to a settling tank and use of the properly settled water in coal washing process, dust suppression and plantation in the plant premises.

1.5.2.4 Land Use Pattern

Proposed Expansion will be taken up in an additional area of 6.48 Ha of the total 25.5 Ha area which comprise of existing coal washery of 1.2 MTPA. The land is already acquired by M/s MCBIPL and comprise of mainly industrial land and some uncultivated land. Out of total 6.48 area, plant will be established in 3.5 Ha area, green belt and plantation will cover 2.14 Ha area, coal storage and reject disposal will be carried out in 0.6 Ha area and raw water reservoir will be provided in 0.14 Ha area. Thus, entire land use pattern of the core zone will be changed.

Measures to avoid impact on land use pattern
- Green belt development will be taken up during construction stage;
- Entire plant area will be aesthetically landscaped;
- Stacking of raw coal, washed coal and coal rejects will be carried out at designated areas within the plant premises..
- Internal roads will be cemented / black topped and maintained periodically.
- Plantation will be developed along the PWD roads used for coal transport.
- Suitable air pollution control measures will be adopted, to control dust emission and deposition on the agriculture crops / land surrounding the plant premises.
- No effluent will be discharged outside the plant premises.

1.5.2.5 Solid Waste Generation & Management

The types of solid waste and their estimated quantities are given in **Table 1.6.**

TABLE 1.6: SOLID WASTE GENERATION

Sr. No.	Type of solid waste	Estimated daily Quantity	Estimated annual quantity
1	Reject coal	1360 tonnes per day	0.48 MTPA
2	Sludge from thickener	5 TPD	1650 tonnes per annum
3.	Spent oil & Grease	1.5 kg/day	~ 500 kg per annum
4.	Damaged/worn out machine parts	-	~ 5 TPA
5.	Domestic waste	5 kg per day	1650 kg per annum

Solid waste management:
- Washery reject coal will be sold to nearby CFBC based thermal power plants and cement plants and Brick kiln operators.

- Thickener sludge will be mixed with washery reject coal and will be dispatched to the user industries.
- The oil and grease will be collected and stored in leak proof containers in store rooms with concrete floorings. This will be sold to the CPCB/CECB authorized recycling vendors periodically.
- The organic and inorganic wastes will be segregated at site itself. Organics will be dumped in existing garbage based bio-gas plant located within the plant premises and the compost will be used as manure for plantation in green belt area. The inorganic waste material will be sold to authorised vendors.

1.5.2.6 Biological Environment

There is no Forest land, National Park, Wildlife Sanctuary and Biosphere Reserve within 10 km radius of the project site. No rare, endemic & endangered species are reported in the buffer zone. Agricultural crops may be affected when exposed to high concentrations of various air pollutants especially particulate matter (dust) & SO_2. This may result in crop damage and loss in agriculture produce to the nearby farmers.

Proposed Biological Environment Conservation Measures
1. Maximise coal transportation through rail mode.
2. Periodic maintenance of coal transport road in collaboration with PWD
3. Regular water sprinkling on PWD road used for coal transport.
4. Covered coal Transport system
- Monitoring of dust fall at agriculture land located nearby the coal washery

1.5.2.7 Socio-economic Environment
- There is no rehabilitation and resettlement involved in the project.
- The proposed coal washery will require about 70 workers as direct employees during operation phase while 150 persons will get employment during construction phase. secondary employment is expected to be generated for more than 100 local persons.
- Under the Corporate Social Responsibility of the company, M/s Maheshwari Coal Benefication & Infrastructure Pvt. Ltd. will take up various socio-economic development programmes in the nearby villages, which will improve socio-economic status of the nearby villages.

1.6 Environmental Monitoring Program

An Environmental Management Cell (EMC) has been established for the existing coal washery project under the control of G.M. (Coal washery). The same EMC will look after the environmental management of the proposed expansion project. The EMC is headed by an Environmental Manager having adequate qualification and experience in the field of

environmental management. Environmental monitoring of ambient air quality, surface and ground water quality, ambient noise levels, etc will be carried out through MOEF accredited agencies regularly and reports will be submitted to CECB/MoEF.

1.7   Risk Assessment & Disaster Management Plan

The assessment of risk in the proposed coal washery expansion project has been estimated for fire, explosion and toxicity and corresponding mitigation measures are suggested in the Draft EIA/EMP report.

A detailed Disaster Management Plan for facing disasters due to natural effects and human reasons, is prepared and incorporated in the draft EIA/EMP report for ensuring safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. For effective implementation of Disaster Management Plan, it will be widely circulated and personnel training through rehearsals. Site facilities, procedures, Duties and responsibilities, Communications, etc are considered in detail in the Disaster Management Plan.

1.8   Project Benefits

The proposed expanion project of coal washery at Parsada village would provide development of area and consequent indirect and direct job opportunities which would finally result in improvement in the quality of life of people in the central region and especially in the area around the coal washery site. In line with this CSR policy, M/s Maheshwari Coal Benefication & Infrastructure Pvt. Ltd. will carry community welfare activities in the following areas:

- Health & Sanitation
- Drinking water
- Education for poor
- Economic upliftment
- Village roads & Lighting

A budget of Rs. 17.5 Lakh as Capital cost and Rs. 13.0 Lakh per annum as recurring expenses has been proposed for implementation of Socio-economic welfare activities in the nearby villages.

1.9   Environmental Management Plan

An Environmental Management Plan comprise of following set of mitigation, management, monitoring and institutional measures to be taken during implementation and operation of

the project, to eliminate adverse environmental impacts or reduce them to acceptable levels.

- Overall conservation of environment.
- Minimization of natural resources and water.
- Safety, welfare and good health of the work force and populace.
- Ensure effective operation of all control measures.
- Vigilance against probable disasters and accidents.
- Monitoring of cumulative and longtime impacts.
- Ensure effective operation of all control measures.
- Control of waste generation and pollution.

Judicious use of the environmental management plan addresses the components of environment, which are likely to be affected by the different operations in the project. A budget of Rs. 400.0 Lakh as capital cost and Rs. 114.0 Lakh as recurring expenses has been allocated for implementation of the Environmental Management Plan.

1.10 Conclusion

The proposed expansion of existing 1.2 MTPA coal washery by establishment of 2.4 MTPA wet coal washery project of M/s Maheshwari Coal Benefication & Infrastructure Pvt. Ltd. will be beneficial for the development of the nearby villages. Some environmental aspects like dust emission, noise, wastewater generation, traffic density, etc will have to be controlled within the permissible norms to avoid impacts on the surrounding environment. Existing environmental pollution control measures will be further strengthened by installing equipments like bag house, water sprinklers, enclosures, thickener, etc.. Measures like development of thick green belt and plantation within plant premises and along transport road, adoption of rainwater harvesting in the plant and in nearby villages, etc will be implemented. The CSR measures proposed to be adopted by the company will improve the social, economic and infrastructure availability status of the nearby villages.

The overall impacts of the proposed coal washery will be positive and will result in overall socio-economic growth of nearby villages.