

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

PROPOSED 2.5 MTPA COAL WASHERY

(Area: 10.1171 Ha)

Located at

**Village- Gataura, Tehsil- Masturi,
District- Bilaspur, State - Chhattisgarh**

Project Proponent:

M/s. Hind Multi Services Pvt. Ltd.

1st Floor, Shree Sai Parisar Commercial Complex,
Shri Shrikant Verma Marg, Bilaspur,
Chhattisgarh - 495001

Environmental Consultant

Anacon Laboratories Pvt. Ltd., Nagpur

Recognized by MoEF (GOI) as per EPA and valid upto Jan'2019
Accredited by NABL for Chemical & Biological), valid up to 03.10.2016
Accredited under the QCI-NABET Scheme for EIA Consultant
Certified by ISO 9001:2008, ISO 14001:2004, ISO 18001:2007
Head Office: 60, Bajiprabhu Nagar, Nagpur-440 033, MS
Lab. : FP-34, 35, Food Park, MIDC, Butibori, Nagpur – 441122
Ph. : (0712) 2242077, 9373287475 Fax: (0712) 2242077
Email: dattatraya.garway@anacon.in, ngp@anacon.in
website: www.anaconlaboratories.com

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EXECUTIVE SUMMARY

1.0 INTRODUCTION

Hind Multi Services Private Limited [hereinafter referred as HMSPL] is incorporated with Registrar of Companies, Gwalior as Private Limited Company. The company is promoted by Shri Pawan Agrawal, engaged in various businesses and having good reputation in the market, which was gained with good business experience. HMSPL is Flagship Company of Hind Energy group of Chhattisgarh having wide interest in coal handling, washing & trading, thermal power generation, logistics and real estate development.

Looking forward in prospects of utilization of washed coal; HMSPL propose to install a 2.5 MTPA Coal Washery, near village Gataura, Tehsil. Masturi, District Bilaspur in Chhattisgarh.

1.1 Identification of Project

M/s Hind Multi Services Pvt. Ltd. has proposed to set up a 2.5 MTPA coal washery at village Gataura, Teh. Masturi, Dist Bilaspur in Chhattisgarh. The company has identified an area of 25 acres (10.1171 Ha) for the project. The project falls under sector 2 (a) in Category A as per the EIA Notification 2006, based on the capacity of the project. TOR has been recommended by the EAC (Thermal & Coal Mining), MoEF vide letter no. J-11015/410/2013-IA.II(M) dated 30.12.2014. The capital cost of the proposed coal washery project is estimated to be Approx. Rs. 35 Crore.

1.2 Location of the Project

The proposed coal washery area is located at village Gataura, Teh. Masturi, Dist Bilaspur in Chhattisgarh. The project area and 10 km radius study area falls in Toposheet no. 64-J/4, 64-J/8, 64-K/1 & 64-K/5 on R.F. 1:50000. The project falls within Latitude: 22°03' 24.8" N to 22° 03' 42.0" N and Longitudes 82°14' 00.4" E to 82°14' 26.12" E.

1.3 Draft EIA/EMP Report

Proposed coal washery project of M/s Hind Multi Services 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 winter 2014-15 i.e. **December 2014 to February 2015** 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: Salient Features of the Project Site

Sr. No.	Particulars	Details
1.	Location	Village Gataura, Teh. Masturi, Dist Bilaspur, State Chhattisgarh
2.	Khasra No.	461, 462, 465, 466, 477, 481 & etc
3.	Total area & present land use	25 Acre (10.1171 Ha) Own land Major uncultivated with few patches of single crop
4.	Site elevation	266 m MSL
5.	Sol Toposheet No.	64-J/4, 64-J/8, 64-K/1 & 64-K/5
6.	Nearest highway	Bilaspur - Champa NH 200 (3.8 km/SW)
7.	Nearest railway station	Gataura Railway Station ~1.0 Km, SW Gataura Railway Siding ~ 1.0 km SW
8.	Nearest airport	Raipur Airport ~115 Km, SSW
9.	Nearest rivers	Kharang River ~ 2.1 Km (W) Arpa River ~ 2.5 Km (SW)
10.	District headquarters	Bilaspur, 10 km WNW
11.	Nearest village	Gataura, 1.25 km NE
12.	Archaeological sites	Mahadeo temple, Gataura village, 2.0 km NE
13.	Reserved / Protected Forests, Protected areas as per wildlife protection act 1972 (tiger reserves, elephant reserve, biospheres, national parks wildlife sanctuaries, community reserves & conservation reserves)	None within 10 km radius area
14.	Seismicity	Seismic Zone II (Low damage risk)
15.	Other industries in 10 km radius	0.96 MTPA coal washery, Adjacent, E NTPC Sipat TPP: 7.8 km NE Silpahari Industrial Area: 6.2 km SW Agio Paper Industry: 3.2 km SW Minor Mineral (stone) & Limestone quarries within 10 km radius

2.0 PROJECT DESCRIPTION

2.1 Process Description

- Transport of raw coal from mines to the adjoining railway siding of the company by railway wagons and from there upto the washing plant by Rear Dump Trucks.
- From the ground hopper, the raw coal shall be fed to a Rotary Breaker for primary sizing and then to close circuit crushing and screening and finally sized to minus 50 mm. The sized coal shall be taken to a series of storage bunker.
- Sized raw coal, (-) 50 mm, from bunker shall be transported to the washing plant building through belt conveyors.
- Coal water slurry then shall flow through launder to a set of De-sliming Sieve Bend and Screen to remove (-) 1 mm coal fines from the coal.
- De-slimed coal shall go from screen discharge chute to the launder. Magnetite media of required specific gravity shall be added at the back of the launder to get mixed with the coal.
- Coal & magnetite mixture shall be pumped to feed to Heavy Media Cyclones. Clean coal along with magnetite media shall be received as over flow from the cyclone.

- Magnetite media shall be drained through Sieve Bend and first part of the Screen and be collected in the screen's dense catch pan and re-circulated back to the washing system.
- Underflow of cyclone along with magnetite shall also be fed to a sieve bend & Reject screen.
- Clean coal collected from discharge end of clean coal screen shall be dried in centrifuge and transported to clean coal storage shed or directly to clean coal storage bunker.
- Reject collected from the overflow of Reject Screen shall be transported to a reject bunker and from there to reject disposal area.
- Fine coal slurry collected in the fine coal tank shall be pumped into a set of classifying cyclone. The underflow of classifying cyclone shall be dewatered in Hi Frequency screen while the overflow from cyclone shall be fed to a Hi-rate Thickener. Thickened slurry from thickener shall be dewatered in a Multi Roll Belt Press filter.
- The discharge from Hi Frequency screen shall be mixed with washed coal. The discharge of belt press shall be mixed with washed coal after weather drying.
- Effluent from the magnetic separator goes to fine coal tank through wetting launder.
- Plant control shall be achieved by a centralised PLC based control system designed to enable one operator to start-up, monitor, and control and shut down all main equipment, and process functions.

2.2 Raw Coal Requirement, Source & Mode of Transport

The annual requirement of raw coal will be 2.5 Million Tonnes. M/s Hind Multi Services Pvt. Ltd. has made an MoU with M/s KSK Mahanadi Power Company Ltd. located at Akaltara, District Janjgir Champa, Chhattisgarh for supply of 2.4 MTPA raw coal for washing. Remaining 0.1 MTPA coal will be obtained through E-auction from SECL mines or on job work basis from the nearby operating industries. Coal will be procured from SECL coal mines in Bilaspur & Korba Area.

Hind Energy Group has established a railway siding adjacent to the proposed 2.5 MTPA coal washery area in Gataura village. Raw coal will be transported from SECL coal mines upto the Gataura railway siding by railway wagons. From the railway siding, the coal will be transported upto the raw coal hopper located at about 0.2 km by trucks. The washery operation will be maintained in a closed system with a wagon loading arrangement at the site. Only in the event of non-availability of railway wagons, coal transportation will be carried out by road.

2.3 Solid waste generation & Management

It is proposed to process 2.5 MTPA raw coal in the proposed coal washery. About 30% of raw coal i.e. 7,50,000 TPA washery reject coal will be generated from the proposed coal washery. M/s Hind Multi Services Pvt. Ltd. has made MoUs with three industries for utilisation of washery reject coal in their power plants.

2.4 Water Requirement & Source

About 1000 m³/day make up water will be required in the proposed coal washery. Make up water will be sourced from Kharang river (2.1 KM W) or Arpa river anicut (2.5 KM SW). An application for permission for drawal of 1000 m³/day water from Kharang / Arpa river has been submitted to Jal Sansadhan Vibhag, Chhattisgarh.

2.5 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. It is estimated to employ direct / indirect employment of 100 people of various skills.

2.6 Site Infrastructure

The coal washery is proposed in Gataura village, Masturi Tehsil, Bilaspur District, 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 provided within the plant premises. Internal black topped roads will be developed. An ambulance facility will be kept ready to attend medical emergency.

3.0 EXISTING ENVIRONMENTAL SCENARIO

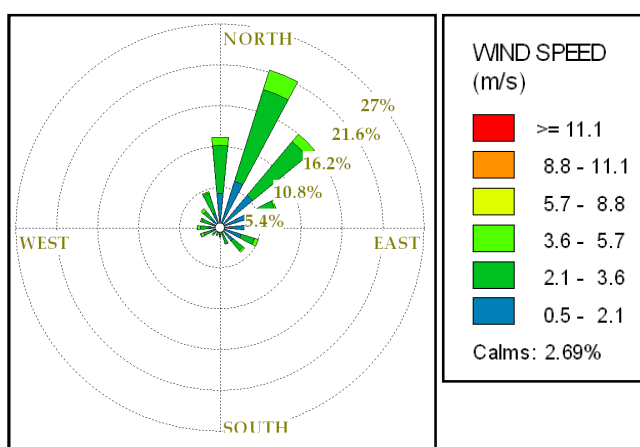
3.1 Baseline Environmental Studies

Baseline environmental studies were conducted in the proposed coal washery area and in the area within 10 km radius from the proposed coal washery area to assess the existing environmental scenario in the area. For the purpose of EIA studies, applied coal washery area was considered as the core zone and area outside the applied coal washery area upto 10 km radius from the applied area boundary was considered as buffer zone. Core zone and buffer zone together formed study area for the project. The baseline environmental quality data for various components of environment, viz. Air, Noise, Water, Land were monitored during winter season i.e. December 2014 to February 2015 in the study area covering 10 km around the proposed coal washery area.

3.2 Meteorology & Ambient Air Quality

Summary of the Meteorological Data Generated At Site (December 2014 to February 2015)

Temperature (°C)	10°C to 30°C
Relative Humidity (%)	10% to 96%
Wind Direction	NNE (21.86%)
Average wind speed	2.25 m/s
Calm wind %	2.69%



Ambient Air Quality Status

The status of ambient air quality within the study area was monitored for winter season during Dec 2014 - Feb 2015 at 12 locations including the proposed coal washery area and in nearby villages. Total 12 sampling locations were selected based on the meteorological conditions considering upwind and downwind directions. The levels of Respirable Particulate Matter (PM₁₀), Fine Particulates (PM_{2.5}), Sulphur Dioxide (SO₂), Oxides of Nitrogen (NO_x) and carbon monoxide (CO) were monitored. The minimum and maximum values of monitoring results are summarized in **Table 2**.

Table 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)	CO (mg/m³)
AAQ1	Core Zone	Minimum	41.8	10.6	9.0	10.9	0.43
		Maximum	70.4	25.8	16.0	27.5	0.94
AAQ2	Gataura	Minimum	37.3	10.8	9.1	12.3	0.42
		Maximum	64.5	23.3	15.1	21.5	0.74
AAQ 3	Nimtara	Minimum	40.7	9.4	8.9	11.3	0.32
		Maximum	56.2	19.5	13.2	20.3	0.80
AAQ 4	Karra	Minimum	44.5	10.7	12.2	15.8	0.51
		Maximum	61.2	20.2	17.6	24.2	0.94
AAQ 5	Dhuma	Minimum	38.9	9.9	7.5	11.0	0.30
		Maximum	64.8	20.5	14.2	22.2	0.80
AAQ 6	Mahramad	Minimum	44.2	14.0	9.7	13.2	0.34
		Maximum	63.7	23.5	14.0	20.1	0.72
AAQ 7	Bhutapara	Minimum	42.8	11.9	8.5	11.9	0.41
		Maximum	65.2	24.0	13.6	19.4	0.78
AAQ 8	Mopka	Minimum	52.4	14.9	11.3	14.2	0.42
		Maximum	75.4	28.3	16.4	22.4	1.04
AAQ 9	Khaira	Minimum	44.3	12.2	11.4	14.4	0.33
		Maximum	70.5	26.2	17.1	26.6	0.80
AAQ 10	Bhilain	Minimum	48.0	12.2	9.1	12.0	0.33
		Maximum	63.9	24.9	13.3	18.6	0.78
AAQ 11	Darrighat	Minimum	36.6	10.1	8.3	11.2	0.32
		Maximum	55.5	22.1	12.0	18.9	0.57
AAQ 12	Masturi	Minimum	40.5	11.4	11.7	16.2	0.33
		Maximum	70.9	25.3	17.7	24.9	0.73
CPCB Standard			100 (24 hrs)	60 (24 hrs)	80 (24 hrs)	80 (24 hrs)	2.0 (8hrs)

From the above results, it is observed that the ambient air quality with respect to PM₁₀, PM_{2.5}, SO₂, NO_x and CO at all the monitoring locations was within the permissible limits specified by CPCB.

3.3 Ambient Noise Levels

Ambient noise level monitoring was carried out at the 12 monitoring locations; those were selected for ambient air quality monitoring. The monitoring results are summarized in **Table 3**.

Table 3: Summary of Ambient Noise Level Monitoring Results

	Core Zone	Gataura Village	Nimtara Village	Karra Village	Bhuta para Village	Mahra mad Village	Khaira Village	Masturi Village	Mopka Village	Bhilain Village	Dhuma Village	Darri ghat Village
Min	43.1	39.2	41.3	39.4	40.1	39.3	40.7	42.5	40.7	39.8	40.6	43.6
Max	58.1	54.4	53.6	53.9	54.8	54.7	55.9	57.8	56.4	54.6	56.9	57.5
Ld	54.2	49.9	51.2	50.3	51.1	51.5	51.9	54.7	52.1	50.0	52.6	54.4
Ln	45.0	40.3	41.8	39.8	41.7	40.8	41.7	44.9	42.3	40.8	41.3	44.0

3.4 Surface and Ground Water Resources & Quality

3.4.1 Water Resources

The 10 km radius study area around the project site is almost flat with elevation varying from 244 m to 290 m MSL. The general slope of the area is towards south. A seasonal nallah flows along the western boundary of the applied project area. Kurung and Arpa rivers form the major drainage of the study area. Kurung river flows from North to south and bisects the study area in two parts. Arpa river (2.5 km W) flows from west to east and joins Kurung river after Bilaspur at about 2.1 km W of the project area. After confluence, the river is known as Arna or Arpa river. Apart from these, Gokena Nala (6.0 km SW) is a perennial surface water body in the study area. There are some irrigation canals passing through the study area. These includes Kurung Left Bank canal (3.5 km E), Minor irrigation canal (0.35 km W), minor irrigation canal (1.3 km SE), and some other minor canals.

The applied coal washery area is located in upper part (NE region) of Masturi Taluka, Bilaspur District. The formation exposed in site location comprises of sequence of alluvium, limestone, dolomite and shale which comes under Kalahandi Formation. The elevation observed at location is from 264 to 271m. The depth to water level observed in the area range from 6m to 7m bgl during Pre-monsoon while in Post-monsoon depth to water level varies from 3m -5m bgl. Ground aquifer yield in the area is around 100 to 300 Liters/min. The entire Masturi Block fall in safe category as stage of ground water development is 18.01% less than 70%.

3.4.2 Water Quality

The existing status of groundwater and surface water quality was assessed by identifying 8 ground water (Bore wells) locations in different villages and 5 surface water samples.

A. Groundwater Quality

The pH of the water samples collected ranged from 7.46 to 8.09 and within the acceptable limit of 6.5 to 8.5. The total dissolved solids were found in the range of 264 - 764 mg/l in all samples. The total hardness varied between 120.5 - 355.3 mg/l for all samples collected at 8 locations.

In all samples, iron content varied in between <0.01 - 0.22 mg/l, Nitrate in between 2.6 - 7.6 mg/l, fluoride varied between 0.1 - 0.31 mg/l, chloride 85.4 - 248.8 mg/l, Sulphate 10.8 - 42.6 mg/l, alkalinity 89 - 260 mg/l, calcium 28.5 - 83 mg/l and magnesium in between 12 - 34.8 mg/l. The overall ground water quality was found to be mineralized with respect to TDS, hardness, chloride, sulphate with moderate buffering capacity. The levels of heavy metals content were found to be within permissible limits.

B. Surface Water Quality

The pH of the surface water samples collected was 7.94 to 8.19 and within the acceptable limit of 6.5-8.5. The total dissolved solids were found to be 156 - 203 mg/l. Total hardness was observed between 64.2 - 85.3 mg/l. Iron content in all samples was found in the range of 0.04-0.05 mg/l, concentration of nitrate was 1.4 - 1.8 mg/l. The fluoride concentration was found to be 0.05 to 0.07 mg/l and chloride concentration was varied between 45.5 - 60.5 mg/l. The sulphate content in all samples was in the range of <2 - 4.4 mg/l. The variation in alkalinity recorded was in the range of 78.7 - 89.9 mg/l, magnesium was found to be in the range of 6.4 to 8.5 mg/l in all samples. It was observed from the analysis that, the physico-chemical characteristics of the surface water samples are within the permissible limits of drinking water standards.

C. Bacteriological Characteristics

Coliform group of organisms are indicators of faecal contamination in water. Water samples were analysed for total and faecal coliform by membrane filtration technique. In groundwater samples, total coliform & faecal coliform were absent in all the samples. Whereas surface water was found to be contaminated by coliform bacteria.

From the results, it was observed that, groundwater is suitable for drinking and domestic uses in absence of alternate drinking water source whereas surface water was not suitable for drinking uses without treatment.

3.5 Land use Land Cover classification

The Land Cover classes for the study area were extracted following a Visual interpretation method or on screen digitization of the Resource Sat-1 Imagery, sensor LISS-4 having 5.6 m spatial resolution image. These were later verified by using SOI toposheet and Google Earth imagery. Polygon layers for each class were digitized and the respective areas were calculated. The Land Cover classes and their coverage are summarized in **Table 4**.

Table 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	58.94	18.77
	Industry/other industries	7.58	2.41
	Road Infrastructure	1.89	0.60
	Railway Line/Railway Siding	0.62	0.20
2	Agriculture Land		
	Cropland/Current Fallow Land	228.98	72.92
3	Water bodies		
	River/Nala/Stream	3.69	1.18
	Pond/Tank	1.39	0.44
4	Scrub/Waste Land		
	Land with scrub/Open Scrub	8.52	2.71
5	Dense Forest	0.57	0.18
	Open Mixed Jungle	0.29	0.09
	Forest Plantation	0.33	0.11
6	Mining/Stone Quarry	0.89	0.28
	Coal Depot Area	0.31	0.10
	Total	314	100.00

3.6 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 8 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. The concentration of heavy metals in the water extract of soil was found to be low with a negligible concentration level of cadmium, chromium, lead, cobalt and selenium. This also indicates the poor level of micro-nutrient. The organic matter and organic carbon was found in the range of 0.68 to 1.10 gm/100 gm and 0.39 to 0.64 gm/100 gm respectively indicating moderate organic content in the soil. Overall the soil quality in the area was found to poor to medium fertile with moderate productivity.

3.7 Biological Environment

Flora in the core & Buffer Zone

Proposed site of the 2.5 MTPA coal washery comprise of major uncultivated with few patches of single crop land surrounded by few agriculture land. There were few trees observed in the project site dominated, by *Acacia nilotica*, *Butia monosperma*, *Azadirachta indica* and Karai. No eco-sensitive area like forest, large water bodies and wetlands exist within close proximity of the project site.

The land use pattern of this region was predominated by agricultural land/fallow land followed by settlements / Habitation area. River Kharang (2.1 Km W) and River Arpa (2.5 Km SW) are the major rivers passing through the study area. No forest observed within study area, natural habitats has confined to very limited area. Trees in the study area are restricted to homestead/ farmland/ canal side / pond side /village side road side plantation. This sort of tree cover is termed by Forest Survey of India (FSI) as 'Trees Outside Forests" (TOF), in the form of small woodlots and block plantations as trees along linear features, such as roads, canals bunds, etc. and scattered trees on farmlands, homesteads, community lands and urban areas.

- **Farm forestry:** Dominant trees observed along the *Acacia nilotica*, *Butia monosperma*, *Azadirachta indica* and *Ailanthus excelsa*.
- **Roadside plantation:** Predominant tree observed along road side is *Acacia nilotica*, *Butia monosperma*, *Peltophorum pterocarpum*, etc.
- **Village woodlot:** *Tactona grandis*, *Syzizium cumini*, *Mangifera indica* (Aam), *Bauhinia racemosa* (Asta), *Embllica officinalis* (Aawla), *Ailanthus excelsa* (Maharukh), *Anona squamosa* (Sitafal), *Tamarindus indica* (Emali) and *Delbergia sissoo* (Sisam).
- **Pond side plantation:** similar trend of growing trees like *Acacia nilotica*, *Butia monosperma*, *Azadirachta indica* and *Zizyphus xylopyra* (Ghont) were observed.
- **Railway side plantation:** *Acacia nilotica*, *Pongamia pinnata*, *Butia monosperma*, *Delbergia sissoo* (Sisam), *Zizyphus mauritiana* (Ber), *Ailanthus excelsa* (Maharukh) and *Acacia leucophloea* (Hivar), etc.
- **Canal side plantation:** *Acacia nilotica*, *Ailanthus excelsa* (Maharukh), *Azadirachta indica* (Neem) and *Cassia fistula* (Cassia), *Pithecellobium dulce* (Vilayti imli), *Prosopis juliflora* (Babool), etc.

Majority of the villages comprise in study area are cultivating rice as dominant crop, while few villagers are cultivating wheat crops. The study area is also remarkable due to the very less *Prosopis juliflora* intrusion and was observed only few patches along the river Arpa and river Kharang side and majority of area comprises of open scrub lands of the study area. No endemic or endangered flora specie observed within the study area.

Fauna in the core & Buffer zone

The wild mammals observed in the core zone are Five striped squirrel, Field rat and Common house rat. The mammals observed in the study area includes Hanuman Langoor, Common Mongoose, Palm squirrel, Field rat, Common house rat and Black-naped hare. The reptiles observed in the study

area include Common garden lizard, Common rat snake, House Gecko, Indian Cobra, Russell's Viper and Common Indian Krait. Birds observed in the study area includes Common Swift, Cattle Egret, Indian Pond-Heron, Small Indian/pariah kite, Red-wattled Lapwing, Indian Cormorant, Red-naped Ibis, Rock Pigeon, Common Kingfisher, Indian Roller, Little Green Bee-eater, Asian Koel, Grey Francolin, Common moorhen, Black Drongo, House Crow, Indian Robin, Purple Sunbird, House Sparrow, Red-whiskered Bulbul, Bank Myna, Brahminy starling, Common Babbler, Common Tailorbird, Rose-ringed Parakeet, Spotted Owlet and Eurasian Hoopoe, etc. There is no schedule I fauna observed in the study area of the project.

3.8 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 & village directory 2001. Summary of the socio-economic status of the study area is given in **Table 5**.

Table 5: Summary of Socio-economic Environment of villages within 10 km radius area

No. of villages	52
Total households	1,05,328
Total population	4,96,751
Male Population	2,55,255
Female population	2,41,496
SC Population	84,920
ST Population	27,736
Total literates	3,64,376
Total workers	1,80,115
Total main workers	1,50,473
Total marginal workers	29,642
Total non-workers	3,16,636

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 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 NO_x 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 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 streams 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. 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.

Ecology & Land environment

Approximately 35 full grown trees will be removed during site preparation. Efforts will be made in order to minimize the tree cutting during development stage of the project. Tree cutting will be compensated by the development of green belt around the periphery of the project site and along the approach road. Trees will be cut only when necessary. Local and fast growing plant species will be planted under greenbelt development programme to enhance green cover in the area.

4.2 Identified Impacts during Operation phase and proposed mitigation measures

4.2.1 Ambient Air Quality

Impacts on Air Quality

Emissions from the coal washery project includes emissions from unloading of raw coal at railway siding, coal transport from railway siding to ground hopper, coal crushing and screening, stacking of raw coal, washed coal and rejects, loading of washed coal in railway wagons/trucks, transportation of raw coal, washed coal and rejects by 20 tonne capacity trucks (occasional), use of DG sets, in case of failure of electricity grid, etc. Ambient air quality modeling was carried out to assess the cumulative impacts on air quality due to existing 0.96 MTPA coal washery of M/s HECBIL & proposed 2.5 MTPA coal washery of M/s HMSPL. ISCST3 Dispersion Model was used for assessing air pollution load from washery operations and CALINE-4 model was used for assessing air pollution load from coal transportation through road.

The predicted worst-case incremental GLC (24-hour average) of PM₁₀ due to operations at coal washery, as predicted by ISCST3 model, was 9.415 µg/m³. The predicted worst-case incremental GLC (24-hour average) due to transportation was found to be 2.30 µg/m³ (1-hour average) or 1.334 µg/m³ (24-hour average).

From the observations of modeling results, it is observed that the cumulative concentrations of PM₁₀ in the study area will remain within the permissible limits after establishment of the proposed coal washery.

Air Pollution Control Measures

- Fixed water sprinklers have been installed at the railway siding. Continuous water sprinkling will be carried out during wagon unloading and truck loading activities.
- Pucca roads will be developed from railway siding to ground hopper.
- Plantation will be developed around coal stock yard to act as dust control measure.
- Provision of bag filters of adequate capacity for coal crushers.
- Use of covered conveyors for internal transport of coal.
- Provision of dust extraction / water sprinkling arrangement at all transfer points.

- Thick green belt will be developed around the plant boundary as a wind screen and dust arrestor.
- Plantation in the plant premises will cover more than 33% of the plant area.

4.2.2 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 50 dB(A), which will further reduce over short distance. The resultant noise levels due to plant operations at the nearest habitation i.e. Gataura village will be about 30 dB(A). Thus, it can be seen that no significant impact will take place on the ambient noise levels due to the proposed coal washery plant operations.

Proposed Noise Control Measures

- Design and layout of building to minimize transmission of noise, segregation of particular items of plant and to avoid reverberant areas;
- Use of lagging with attenuation properties on plant components / installation of sound attenuation panels around the equipment;
- Periodic maintenance of equipments and machinery;
- Provision of acoustic enclosures to stationary equipments;
- Provision of sound proof cabins to wheel loaders & other HEMMs;
- Provision of ear muffs/ear plugs to workers exposed to high noise generating areas;
- Development of thick green belt around plant boundary and within plant premises;
- Periodical monitoring of noise in the plant premises and in nearby villages;

4.2.3 Water Resources & Quality

Impact on Water Resources & Quality

There is no surface water stream flowing within the proposed project site. A seasonal nallah flows along the western boundary of the applied project area. A micro-irrigation canal is located at about 350m away from the proposed coal washery. The canal is non-functional and remains dried during non-monsoon period. About 1000 m³/day make up water is required for industrial purposes during the operation phase of the proposed coal washery project. The water is proposed to be obtained from Arpa river / Kharang river anicut located at about 2.5 km West of the project. Application for necessary permission has been submitted to the Jal Sansadhan Vibhag, Chhattisgarh. There will not be any drawal of ground water for the proposed project operation. Hence, there will not cause any impact on the ground water resources of the area.

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 Hind Multi Services Pvt. Ltd. will implement water recovery system involving high speed thickener coupled with belt press for maximum recovery of water and recirculation of the recovered water in process, thereby making the plant a zero discharge unit. 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.

- Apart from this, M/s Hind Multi Services 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.
- Domestic discharge from rest shelters, canteens and toilets will be channeled through proper sewage drains connected to Septic tanks followed by soak pits.
- Storm water run-off from the plant area and parking premises will be collected in a series of settling tanks and will be utilized for coal washing, dust suppression and plantation.
- Wash water from workshop will be treated in oil & grease trap and treated water will be used for sprinkling at coal stack yard.

4.2.4 Land Use Pattern

The proposed coal washery project will be located in 25 Acre (10.1171 Ha) area. The land is already acquired by M/s HMSPL and comprise of major uncultivated land with few patches of single crop. The proposed land utilization pattern of the coal washery project is given in **Table 6**.

Table 6: Proposed Land Use of Coal Washery Area

Sr. No.	Description	Area (in acres)	%
1	Plant Area	9.0	36
2	Reject Disposal Area	2.25	9
3	Coal Storage Yard & Truck Tripling System Yard	2.0	8
4	Raw Water Reservoir	1.5	6
5	Fabrication/Construction Yard	1.5	6
6	Green Belt	8.25	33
7	Others (Office, Store, Rest Area, Canteen, First Aid Centre)	0.5	2
Total		25.0	100

Measures to avoid impact on land use pattern

- Development of thick green belt in 8 Acre area within plant premises;
- Aesthetic landscaping of plant and maintaining natural gradient;
- Stacking of raw coal, washed coal and coal rejects will be carried out at designated areas within the plant premises.
- Regular maintenance of internal roads and public roads used for coal transport.
- Plantation along the village roads used for coal transport.
- Adoption of suitable air pollution control measures to control dust emission.
- Adoption of Zero Effluent Discharge Practice.

4.2.5 Solid Waste Generation & Management

- About 7,50,000 Tonnes per annum washery rejects will be generated, which will be supplied to CFBC based thermal power plants.
- Sludge from thickener will be mixed with washery rejects and will be supplied to user industries.
- Spent oil & grease will be separately collected and stored in leak proof containers and will be sold to the CPCB/CECB authorised recycling vendors.

- Damaged / worn out parts of the machines will be collected and stored in shed on concrete flooring. These parts will be returned to the manufacturing company or will be sold to the authorized recycling vendors.
- The food waste from canteen will be dumped in a composting pit provided in plantation area and the compost will be used as manure for plantation in green belt area.

4.2.6 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. Dust deposition on leaf lamina will take place on nearby local plant species along the transport road which may result in decline the rate of photosynthesis and retards the plant growth. Agricultural crops can be injured when exposed to high concentrations of various air pollutants especially particulate matter (dust) & SO₂. Injury ranges from visible markings on the foliage, to reduced growth and yield, to premature death of the plant.

Proposed Biological Environment Conservation Measures

- Development of thick green belt is 8.25 Acre area within the plant premises.
- Preference for high canopy covers plants with local varieties
- Perennial and evergreen plants will be preferred.

Control Measures to avoid impacts on agriculture crops:

- Periodic maintenance of mineral transport road in collaboration with PWD
- Regular sprinkling of water through mobile tanker on coal transport road.
- Covered Transport system
- Plantation along the transportation route

4.2.7 Socio-economic Environment

- Land for the proposed coal washery is already owned by M/s HMSPL. There is no rehabilitation and resettlement involved in the project.
- The proposed coal washery will require about 100 workers as direct employees. This will provide employment opportunities to the local people as most of the workers will be recruited from nearby villages.
- Due to coal washery activities, vehicle movement will increase in nearby villages.
- The establishment of coal washery will also result in improvement in the existing infrastructure facilities like roads, electricity, communication facilities, etc.
- Under the Corporate Social Responsibility of the company, M/s Hind Multi Services Pvt. Ltd. will take up various socio-economic development programmes in the nearby villages, which will improve socio-economic status of the nearby villages.

5.0 ENVIRONMENTAL MONITORING PROGRAM

An Environmental Management Cell (EMC) will be established for the proposed coal washery project under the control of G.M. (Coal washery). The EMC will be 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.

6.0 RISK ASSESSMENT & DISASTER MANAGEMENT PLAN

The assessment of risk in the proposed coal washery 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.

7.0 PROJECT BENEFITS

The proposed project of coal washery at Gataura 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 HMSPL will carry community welfare activities in the following areas:

- Community development
- Education
- Health & medical care
- Drainage and sanitation
- Roads

A budget of Rs. 33.0 Lakh as Capital cost and Rs. 29.1 Lakh per annum as recurring expenses has been proposed for implementation of Socio-economic welfare activities in the nearby villages.

8.0 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. 391.7 Lakh as capital cost and Rs. 104.0 Lakh as recurring expenses has been allocated for implementation of the Environmental Management Plan.

9.0 CONCLUSION

The proposed 2.5 MTPA coal washery project of M/s Hind Multi Services Pvt. Ltd. will be beneficial for the overall 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. Necessary pollution control equipment like bag house, water sprinklers, enclosures, thickener, etc., will form integral part of the plant infrastructure. Additional pollution control measures and environmental conservation measures will be adopted to control/minimize impacts on the environment and socio-economic environment of the area. 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.

10.0 DISCLOSURE OF CONSULTANTS

The Environmental studies for proposed 2.5 MTPA Coal washery project of M/s HMSPL is conducted by M/s Anacon Laboratories Pvt. Ltd., Nagpur (M/s ALPL). Anacon established in 1993 as an analytical testing laboratory and now a leading Environmental Consultancy firm backed by testing lab for environment and food in Central India region. M/s ALPL is a group of experienced former Scientists from the Government Institutions and recognized by Ministry of Environment & Forests, New Delhi for carrying out environmental Studies & accredited by Quality Council of India (QCI) for conducting Environmental studies vide 44th NABET Accreditation Committee Meeting for Re-Accreditation held on Mar 04, 2015 as category A consultant organization in 14 Sectors including coal washery projects.