

PRE-FEASIBILITY REPORT

For

PRIOR ENVIRONMENTAL CLEARANCE

Of

**KENTE EXTENSION OPENCAST COAL MINE &
INTEGRATED WASHERY PROJECT**

9 MTPA (NORMATIVE) / 11 MTPA (PEAK)

HASDEO-ARAND Coal Field, Tehsil Udaypur,
District Surguja, Chhattisgarh

Project Proponent
M/s Rajasthan Rajya Vidyut Utpadan Nigam Limited
(RRVUNL)

R.C. Dave Marg, Vidyut Bhawan, Jyoti Nagar,
Jaipur, Rajasthan 302005.

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Pre-Feasibility Report

1. Executive Summary

S.No	Description	Details
1	Name of the Project	Kente Opencast Coal Mine & Integrated Washery Project
2	Name and Address of the Applicant (present & permanent address)	Rajasthan Rajya Vidhut Utpadan Nigam Limited Vidyut Bhawan, Janpath, Jyoti Nagar, Jaipur, Rajasthan – 302 005
3	Location of the Mine	Mine is located in Hasdeo-Arand Coalfield area, Tehsil Udaypur, District Surguja, Chhattisgarh. The Mine lease area is 17.6 Sq. Km Coordinates of the Mine Lease area are Latitude 22°47'00.802"N to 22°49'58.536" N Longitude 82°49'21.991"E to 82°52'48.833" E
4	Production/Estimated Reserves	Capacity: 9 MTPA (Normative)/ 11 MTPA (Peak) Net Geological Reserve : Total: 369.22 Million Tonnes
5	Total area reserved for Mining	Block Area – 1760 Ha. Excavation area:1647.537 Ha
6	Total Water requirement & Source	Total water requirement for the project is 4213 m ³ /day including mining activities, washery & potable water. Water required for the mining activities will be sourced from tube wells in the first year and & afterwards water will be sourced from mine reservoir after treatment in water treatment plant.
7	Working hours	Three shifts operation with 8 hour shift has been planned.
8	Manpower (Operation)	919 (approx.)
9	Estimated Cost of the Project	2344 Crore
10	Nearest Railway station, Sea Port, Airport	Railway siding upto adjacent PEKB mine. Nearest Airport Raipur (290 km, SW).
11	Existence of Public Road, Railway Track nearby	The Block is connected to the NH 30 and passing at a distance of about 11 Km from its N-W corner.

2. Introduction of the project

2.1. Identification of Project and Project proponent

The Kente Extension coal block in the state of Chhattisgarh has been allotted to M/s. Rajasthan Raja Vidyut Utpadan Nigam Limited (RRVUNL) vide vesting order No - 13016/26/2004-CA-I/CA-III(Pt) (Vol. II), dated 31st March, 2015 to meet the coal requirement of their two thermal power project.

2.2. Brief Description of nature of the project

The proposed project involves the mining of coal in an extent of 17.6 Sq. Km. and falls in schedule 1(a) (i) Mining of Minerals of Category 'A'.

2.3. Need for the project and its importance to the Country and or Region

The coal produced in the Knete Coal mine will be transported to the following Power plants of RRVUNL in Rajasthan-

- i. Chhabra Supercritical TPP, District- Baran, Rajasthan
- ii. Suratgarh Supercritical TPP, District-Shriganganagar, Rajasthan

2.4. Domestic and Export Market

Coal produced from this coal block shall be utilised in the power plants existing at two locations in Rajasthan and details are given in Table 2.1

Table-2.1

Sl. No.	Name of specified end	Address	Configuration	Capacity
1.	Chhabra Supercritical TPP Unit -5 to 6	Motipura Choki, Chhabra, District- Baran, Rajasthan	2 x 250 MW 2 x 660 MW	1820 MW
2.	Suratgarh Supercritical TPP, Unit- 7 & 8	Thukrana, Tehsil – Suratgarh, District-Shriganganagar, Rajasthan	2 x 660 MW	1320 MW

2.5. Employment Generation due to the Project

The mining project will generate direct & indirect employment. Detail of employment shall be envisaged in DPR.

3. Project Description

3.1. Interlinked Projects

Proposed project is for mining of coal for Chhabra Supercritical TPP & Suratgarh Supercritical TPP of RRVUNL. Lease area is 17.6 Sq. Km. and it is proposed to produce of 9 MTPA (normative)/ 11 MTPA (peak).

3.2. Details of alternative sites

Mineral is natural occurring substance which is site specific. Hence, no alternative site has been examined.

3.3. Location of Project

Mine is located in Hasdeo-Arand Coalfield, Kente Village, Tehsil Udaypur, District Surguja, Chhattisgarh.

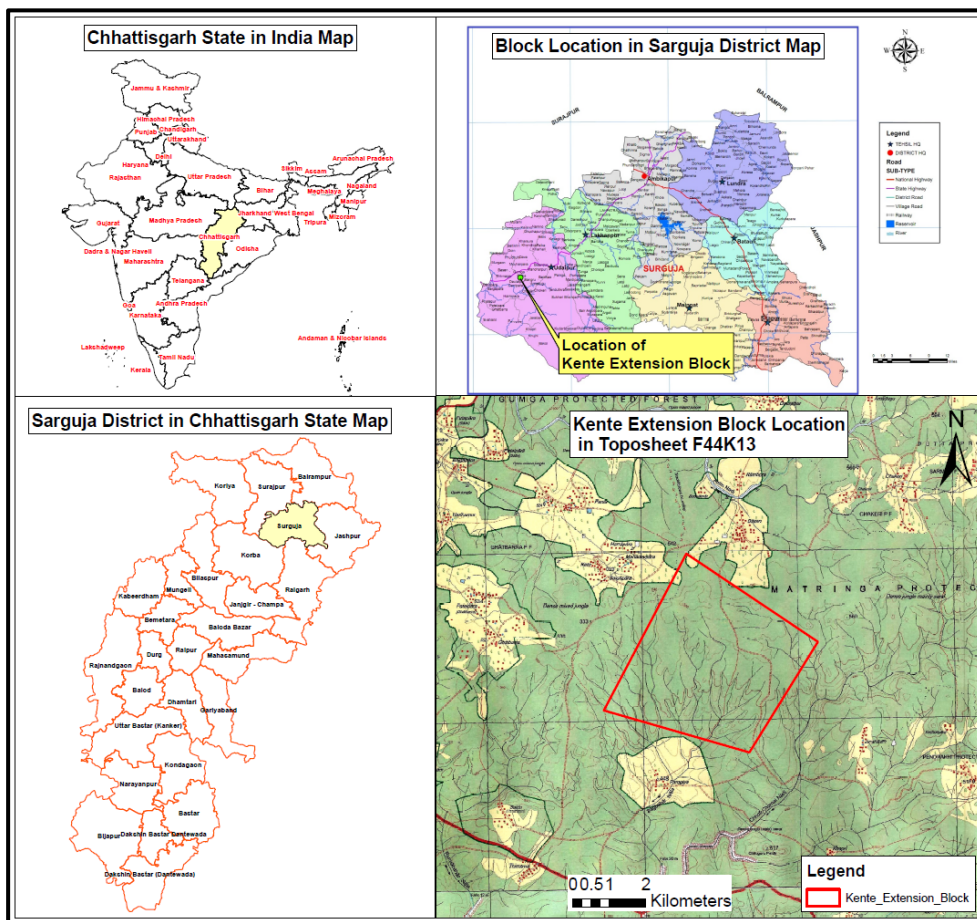


Figure 1 Index map of the site

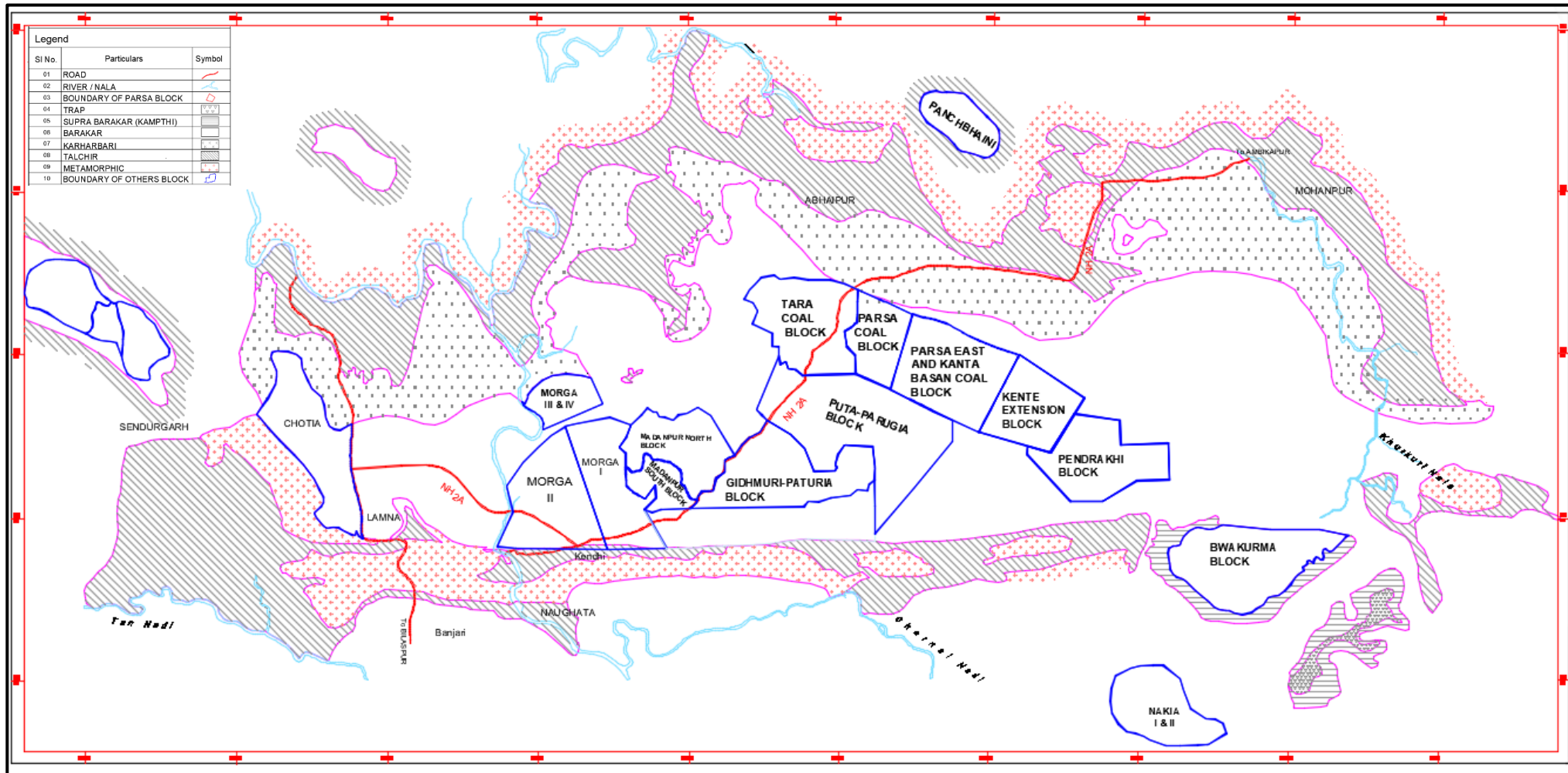


Figure 2 Geological Map

3.4. Project Description and Project Details

Net geological reserves of coal as per Geological Report (GR) are 369.223 MT break-up of these reserve as envisaged, is tabulated below-

Table 3.1 Summary of Coal Reserves

1	Gross Geological reserves	410.248
2	Net Geological Reserve (Mt)	369.223
3	Reserves blocked in barrier (7.5m and 25m) and not considered for mining (Mt)	2.709
4	Reserves blocked in batter and not considered for mining (Mt)	32.805
5	Total Reserve Blocked in Barrier and Batter and not considered for Mining (Mt)	35.514
6	Mineable Reserves with in the proposed pit (Mt)	333.709
7	Mining loss (considering dirt band of shale and high carb. shale of >30 cm)	62.11
8	Extractable Reserves (Mt)	271.60

For the rated output of 9.0 Mty, the life of the mine has been estimated as 33 years, built up period & reducing trend of coal production in start and finishing years of the mine.

The Kente Extension coal block is spread over an area of 17.6 sq. km. As per vesting order it is bounded by Latitude 22°47'00.802"N to 22°49'58.536" N and Longitude 82°49'21.991"E to 82°52'48.833" E . The block is covered under Survey of India topo sheet no. 64J/13 (OSM: F44K13) on RF 1: 50000.

The block is quadrilateral in shape and extends about 4.2 km along strike direction (NW-SE) and about 4.8-3.8 km along dip direction (SW). The Tehsil headquarter at Udaipur is located 26 km northeast of the block on National Highway NH-30 connecting Bilaspur and Ambikapur.

Total 1760.00 Ha of land is proposed to be acquired for the Kente Extension Opencast Coal Mine & Integrated Washery Project, which would be utilized for different purposes to carry out the operations as stated in Table below.

Table 3.2 Land Requirement

SL. NO.	PARTICULAR	LAND (ha)		
		Forest	Non Forest	Total
A	MINING			
1	EXCAVATION AREA	1632.722	14.815	1647.537
B	INFRASTRUCTURE & OB DUMP AREA			
1	EXTERNAL DUMP	46.621	1.445	48.066
2	ELECTRIC LINE & INFRASTRUCTURE AREA	5.241	-	5.241
3	COAL EVACUATION ROUTE & APPROACH ROAD	6.757	-	6.757
4	SETTLING POND	2.262	-	2.262
5	CHP & WASHERY	8.508	0.810	9.318
6	DIVERSION OF ROAD	4.925	0.005	4.930
7	SAFETY ZONE	12.350	0.310	12.660
8	RATIONALISATION AREA	23.214	0.015	23.229
TOTAL (B)		109.878	2.585	112.463
GRAND TOTAL (A + B)		1742.600	17.400	1760.000

** Top Soil is proposed to be placed within the excavation area and re-handled*

➤ Mining Parameters

Table 3.3 Mine parameters

Sl. no.	Parameters	Unit	Value
1	Maximum depth	m	195
2	Maximum strike length: along the Mine Floor along the Mine Surface	Km	4.1
		Km	4.2
3	Minimum strike length: along the Mine Floor along the Mine Surface	Km	3.7
		Km	4.0
4	Maximum dip rise length: on the Mine Floor on the Mine Surface	Km	4.0
		Km	4.1
5	Minimum dip rise length: on the Mine Floor on the Mine Surface	Km	2.8
		Km	2.9
6	Area: On the Mine Floor	ha	1499.0

	On the Mine Surface	ha	1647.5
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Kente Extension Opencast Coal Mine & Integrated Washery Project is proposed to be developed in the 1st year of mine operation by grading properly the access trench of 40 m width with the help of Hyd. Backhoe and 35 T dumpers and other auxiliary HEMM. The access trench is to be graded from 530 m R.L. at 1 in 16 to the mine floor of about 510 m R.L. The box cut is developed in such a manner so as to facilitate the proper drainage of water towards the sump. This would also facilitate extension of coal and OB bench for full development of mine. The mine will advance towards dip direction exposing the floor of Seam-IV. After creation of sufficient de-coaled area, internal backfilling of OB will be started. The coal production will start from the 1st year of mine operation and the target coal production of 9.00 MTY will be achieved in the 3rd year of mine operation.

The alignment of the face has been so planned as to facilitate the drainage of water. The quarry has been divided centrally into two parts i.e. east and west for optimum mine operation and transportation of coal and OB. Both Eastern and Western part will be worked simultaneously. During working of the quarry, haul road will be developed at 1 in 16 gradients along center of the quarry.

As gradient of coal seam is flat, haul road in quarry is designed along center of the quarry. This central haul road will serve both eastern as well as western quarry. 40 m haul road has been proposed.

➤ Washery Process Details:

A Coal Washery with a Raw Coal throughput capacity of 9 MTPA has been proposed at the mines pit head of the Kente Extension Coal block to wash coal in order to meet the coal requirement of thermal power projects of RRVUNL. The technology adapted for achieving the committed quality requirement of customer, for 9 MTPA production stage, number of washing circuits have been proposed for washing the (-) 50 mm coal. The raw coal produced from Mines being conveyed to CHP through feeding conveyor and after crushing & screening stage of CHP, (-)50 mm or Coarse raw coal being conveyed to Washery Building through feeding conveyor. At first instance from the raw coal approx. 8-13mm shall be screened out and separated and the oversize of coal shall be fed to these washing circuit which shall deliver two products i.e. washed

coal with average 30% ash and the rejects. The washed product from the washing plant shall be mixed with already screened out fines coal and it shall be fed to the dispatch system of the coal handling plant. The quality of the dispatch coal shall meet the requirement of the RRVUNL i.e. 30% ash, 10% moisture and overall GCV shall not be less than 4500 Kcal. /kg. (ADB) Sufficient water will be available from mine seepage to cater water requirement of various mining & washery activities. Hence no ground water is required. Subject to detailed washability analysis the washery will produce approximate 5.8 to 6.8 MTPA of clean coal with an ash content of 30% and 3.2 to 2.2 MTPA of rejects.

The washery is planned with the state of the art technology with due consideration to environment in and around washery. The washery plant will be operating with a carefully designed closed loop water circuit with zero discharge outside and also deploys suitable required measures to keep noise and air under control as per statutory norms. Also afforestation surrounding the plant has been considered to work as barrier for dust and noise.

9 MTPA state of art CHP & washery will be constructed in Kente Extension coal block taking socio- environmental aspect into consideration.

➤ Coal Transportation

Conveyors are provided to transport coal from coal handling Dump Hopper to wagon loading silo station with Rapid Load out System. Belt conveyor has been envisaged for less fleet of dumper, negligible air pollution and negligible noise pollution.

Wagon loading station will be used for loading coal into a rake of open type Wagons while in motion hauled by loco. Normally the rake shall consist of identical type of wagons.

Exchange yard will be the handing over point of the rakes between the railway and the Colliery. After clearance of the rakes in the exchange yard, Colliery's shunting loco will haul the empty rakes of wagons to the wagon loading station via in-motion Weigh Bridge. Rake will leave exchange yard to the loading station/waiting line on the

advice from the Central Control room. Details of rake to be loaded will be available with the operator at the in motion weigh bridge prior to its arrival and the same will be entered by the operator and transmitted electronically to the rake loading operator/control cabin of Wagon Loading Station.

The in motion wagon loading system shall be weigh batch type (having pre-weigh bin) system. The rake will be hauled at a uniform speed below the wagon loading point and will be loaded with required quantity of coal by using the pre-weigh bin system.

The nearest railhead Bisrampur on the Bijuri-Ambikapur section of the South East Central Railway (SECR) is located about 72 km from the northwestern corner of the block. A Common Rail Corridor (CRC) of 70 Km is operational from Surajpur Railway Station a part of South East Central Railway to adjacent Parsa East Kanta Basan (PEKB) opencast coal project for transportation of coal.

Loaded Coal wagon will move to Surajpur Railway Station which is situated on Anuppur- Ambikapur branch line on Bilaspur Division of South East Central Railway. From Surajpur Railway Station, coal wagon will move to power plant by rail.

3.5. Availability of water its source, Energy/ Power Requirement and Source

3.5.1. Water Source

Total water requirement for the project is 4213 m³/day including mining activities, washery & potable water. Water required for the mining activities will be sourced from tube wells in the first year and afterwards water will be sourced from mine reservoir after treatment in water treatment plant.

3.5.2. Energy/Power Source

The proposed mining block is virgin. Based on rated capacity of 9.0 MTY ROM Coal for Kente coal Block and assuming certain parameters for coal transportation and loading, washery & pumping etc the tentative requirement of power shall be in the range of 7.5 to 12 MVA at 33 kV.

The power supply for Kente Coal Block shall be taken from existing 132/33 KV substation to Kente Coal Block (allotted to M/s. RRVUNL), which is about 3-4 KM from Kente Coal Block.

Restricted earthing has been envisaged for Electrical System. All electrical system will have protection from lightning and high voltage surge. Switching station and substation shall be equipped with all safety features firefighting system.

3.6. Coal Production Target

Kente Extension Coal Block Proposed Calendar Plan is tabulated below-

years	Coal		years	Coal	
	Progressive (Mt)	Cumulative (Mt)		Progressive (Mt)	Cumulative (Mt)
1	2.00	2.00	14	9.00	115.00
2	5.00	7.00	15	9.00	124.00
3	9.00	16.00	16	9.00	133.00
4	9.00	25.00	17	9.00	142.00
5	9.00	34.00	18	9.00	151.00
6	9.00	43.00	19	9.00	160.00
7	9.00	52.00	20	9.00	169.00
8	9.00	61.00	21	9.00	178.00
9	9.00	70.00	22	9.00	187.00
10	9.00	79.00	23	9.00	196.00
11	9.00	88.00	24	9.00	205.00
12	9.00	97.00	25	9.00	214.00
13	9.00	106.00	26-33	57.60	271.60
Total			271.60		

3.7. Productivity Enhancement

The mine has been designed to produce at the rate of 9.0 MTY on consistent basis through out life of the mine. The design of the mine is mainly based on lay and deposition of coal seams and intervening partings of the block as estimated in the geological report and the HEMM productivity norms adopted.

Keeping into account the current state of development in technology and attainment of improved skills of operators and maintenance crew, it will be possible for coal producing company to achieve higher coal production from the targeted by achieving higher availability and utilization of HEMM.

It is therefore, Kente extension OCP may produce coal higher to 11 MTY in any one or all the year of the life of the mine against normative mine capacity of 9 MTY.

3.8. Quantity of Wastes Generated and Scheme for their Management /Disposal

The opencast mine is proposed up to 195 m depth with overall average stripping ratio of 4.44.

The total volume of Over Burden (OB) has been estimated as 1206.82 Mcum. The OB removed during initial years will be placed beyond the incrop of the seam- IV. The total volume of external dump has been estimated as 27.67 Mcum. Rest of the OB will be placed in internal dumps. The total volume of internal OB, i.e. the volume which will be accommodated internally by backfilling has been estimated as 1179.15 Mcum..

The internal dumping will start when about 100 m space is available on quarry floor. By adopting the proposed sequence of mining, as the quarry advances, the amount of internal dump will increase as more space for the internal dumping is created. For external dumps no additional land will be required outside the block boundary. External dump will be accommodated inside the block boundary. One external dump, has been proposed on the north eastern side of the block boundary. Two internal dump i.e. internal dump west and east has also been proposed.

Overburden will be dumped in external as well as internal dump. Height of external dump will be 60m above ground level at the end of mine operation.

The top soil is to be used with minimum time lag for spreading over the external & internal dumps.

It is proposed to reclaim dump with plantation etc. after dumping / spreading

top soil over the external and internal dumps.

➤ Top soil management

Efforts will be made to excavate and segregate top soil separately. Top soil will be scrapped by dozer before the ground preparation for drilling and blasting. Scrapped top soil will be transported to the top soil storage area. During initial period of mining the top soil shall be directly utilized for plantation of saplings along the proposed roads and barren land. As and when the external waste dump gets stabilized the stored top soil will be spread over the area of dump to facilitate plantation.

Top soil is proposed to be removed separately and dumped inside the quarry in a manner so as not to lose its fertility. The top soil would be spread over the reclaimed land, afterward.

Top soil will be removed and dumped on the excavation area. Top soil will be stored for initial four years and during subsequent years it will be directly spread over the reclaimed area.

4. Site Analysis

4.1. Topography

The block is characterized by highly undulating topography with mounds as well as elevated and flat land. The elevation of the area above mean sea level (MSL) ranges from 445m in the southern part to 585m in the northwest eastern part. The general slope of the land is towards SSE in the northern, part of the block while the slope is towards South in the southern part

The ground is deeply incised by a prominent Bagbahar nala and its tributaries flowing from almost North to South in the eastern part. The drainage within the block is controlled by several small streamlets which have deeply incised the ground where these cut through softer and friable litho units of Barakar Formation and ultimately join up and merge into perennial Bagbahar Nala and its tributaries flowing southerly. Small ponds and dug wells are common in the area. These are utilized for irrigation and drinking water purpose.

Artem river flowing from northeast to northwest taking a “U” turn to the north of Kente Extension block is the main drainage with all the lower order streams discharging into it. Another set of moderate drainage flowing north to south (Bagbahar, Choti and Chorwahi nala) to the south of the block show dendritic and rectilinear drainage pattern. Dissected and rocky grounds exhibit characteristic undulating topography dotted at places with boulders and rock outcrops. The land in the southern part of the block exhibits rills and gully erosion which have formed landforms bad land.

4.2. Land Use Pattern

Table No 4.1: Existing Land Use

Land Use Category	Area (Ha)
Forest Land	1742.60
Tenancy Land (Agriculture etc.)	4.233
Government Land (Non Agriculture)	13.167
Total	1760.00

(A) SCHEDULE OF LAND

Details of Tenancy, Govt. and Chhote-Bade Jhar ka Jungle (Revenue Forest)

Sl. No.	Mouza	Patwari Halka no.	Tahsil	District	Proposed Area (Hectare)					
					Tenancy land			Govt. Rev.	CJJ+BJJ	Total
					Adivasi	Non-Adivasi	Total			
1	KETE	16	Udaipur	Surguja	2.966	0.000	2.966	1.246	0.000	4.212
2	BASEN	16	Udaipur	Surguja	0.809	0.000	0.809	0.250	0.000	1.059
3	CHAKERI	18	Udaipur	Surguja	0.000	0.458	0.458	0.951	0.000	1.409
4	PAROGIA	17	Udaipur	Surguja	0.000	0.000	0.000	10.720	0.445	11.165
Total					3.775	0.458	4.233	13.167	0.4450	17.845

(B) SCHEDULE OF LAND

Details of Protected Forest Land (Hactares)

Sl. No.	Forest Circle	Forest Division	Range	Name of Bit	Compartment no.	Total Area (Hactare)	Required area (Ha)	Remarks
1	Surguja	Surguja	Udaipur	Ghatbarra	P-2003	225.261	19.706	Part
2	Surguja	Surguja	Udaipur	Basen	P-2099	418.131	42.784	Part

3	Surguja	Surguja	Udaipur	Basen	P-2104	306.654	234.960	Part	
4	Surguja	Surguja	Udaipur	Basen	P-2105	225.251	203.194	Part	
5	Surguja	Surguja	Udaipur	Basen	P-2106	207.337	154.543	Part	
6	Surguja	Surguja	Udaipur	Parogiya	P-2107	177.936	176.481	Part	
7	Surguja	Surguja	Udaipur	Parogiya	P-2108	150.391	92.484	Part	
8	Surguja	Surguja	Udaipur	Parogiya	P-2109	210.223	122.478	Part	
9	Surguja	Surguja	Udaipur	Parogiya	P-2110	183.034	43.827	Part	
10	Surguja	Surguja	Udaipur	Saidu	P-2111	106.763	5.491	Part	
11	Surguja	Surguja	Udaipur	Parogiya	P-2124	203.856	70.959	Part	
12	Surguja	Surguja	Udaipur	Parogiya	P-2125	269.982	78.426	Part	
13	Surguja	Surguja	Udaipur	Parogiya	P-2126	342.321	342.321	Full	
14	Surguja	Surguja	Udaipur	Parogiya	P-2127	287.769	139.621	Part	
15	Surguja	Surguja	Udaipur	Chakeri	P-2128	206.380	1.122	Part	
16	Surguja	Surguja	Udaipur	Chakeri	P-2130	232.276	4.946	Part	
17	Surguja	Surguja	Udaipur	Basen	P-2069	50.461	0.152	Part	
18	Surguja	Surguja	Udaipur	Parogiya	P-2112	194.774	8.660	Part	
TOTAL AREA						3998.800	1742.155		Total area(Ha)
Total forest area(Ha) = Revenue forest area + Protected forest area =						0.4450	+	1742.155	1742.600
Total non forest area(Ha) = Pvt land area + Govt Revenue land area =						4.233	+	13.167	17.400
Total Kente Extension Coal Block area (Hactares)(forest area + non forest area) =						1742.600	+	17.400	1760.00

Table No 4.3: land use plan (During Mining)

SL. NO.	PARTICULAR	LAND (ha)		
		Forest	Non Forest	Total
A	MINING			
1	EXCAVATION AREA	1632.722	14.815	1647.537
B	INFRASTRUCTURE & OB DUMP AREA			
1	EXTERNAL DUMP	46.621	1.445	48.066
2	ELECTRIC LINE & INFRASTRUCTURE AREA	5.241	-	5.241
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6	DIVERSION OF ROAD	4.925	0.005	4.930
7	SAFETY ZONE	12.350	0.310	12.660
8	RATIONALSATION AREA	23.214	0.015	23.229

TOTAL (B)	109.878	2.585	112.463
GRAND TOTAL (A + B)	1742.600	17.400	1760.000

** Top Soil is proposed to be placed within the excavation area and to be rehandled*

4.3. Meteorological Data

Table No 4.4: Meteorological Data

Sr. No.	Parameters	Unit	Oct-2008	Nov-2008	Dec-2008	
1	Wind Speed	Max	m/s	11.8	6.2	6.2
		Avg	m/s	1.62	1.35	1.28
2	Predominant Wind Direction	----	ENE	NEN	ENE	
3	Temperature	Max	°C	34.6	27.5	35.7
		Min	°C	10.1	7.7	5.3
		Avg	°C	22.38	17.62	16.19
4	Relative Humidity	Max	%	96.2	99.7	99.3
		Min	%	22	18.5	19.4
		Avg	%	72.64	76.17	77.12
5	Atmospheric Pressure	Max	mb	960	959	951
		Min	mb	943	936	940
		Avg	mb	954	952	943
6	Rainfall	Max	mm	32.6	3.9	0.0
		Min	mm	2.5	0.3	0.0
		Total	mm	25.9	2.0	0.0
7	Solar Radiation	Max	millivolt	926.0	922.4	919.9
		Min	millivolt	10.9	11.2	10.7
		Avg.	millivolt	188.2	186.8	184.1

5. Infrastructure facilities

Following infrastructure facilities shall be planned for operation of Kente open cast project.

- Service buildings (i.e. Mine functional area)
- Industrial buildings (i.e. Mine industrial area)
- CHPP workshop and store
- Roads including diverted roads
- Substation
- Magazine

5.1. Service buildings (i.e. Mine functional area)

As a part of mine functional area only office, canteen, coal lab, rest shelter, security cabin and first aid center shall be provided. Size of the building shall be decided based on manning numbers and as per standard industrial practice. Building shall be RCC frame / steel structure / Porta cabin / container as per functional requirement.

5.2. Industrial buildings (i.e. Mine industrial area)

➤ Workshop

For maintenance and repair of equipment deployed in Kente opencast project, the following maintenance and repair concept has been envisaged:

- a) Daily maintenance, scheduled maintenance, minor repair and medium repair
proposed to be carried out in the project maintenance and repair unit.
- b) Capital repair and major overhauling of equipment at manufacturer's repair unit or, by outside agency at site.

➤ E&M Maintenance and repair unit

Scope of work for E&M maintenance and repair unit will be

- Minor repair, medium repair and replacement of components, assemblies and sub-assemblies of CHP, pumps and electrical equipment.
- Minor and medium repair of switch gears, motors, self-starters and other electrical equipment.

5.3. CHPP workshop and store

Workshop and store shall be provided for repair / maintenance / storage of various equipment of coal handling and coal processing facilities. It shall be steel structure with side sheeting and roofing. Size shall be as per functional requirement.

5.4. Road

➤ Haul Road

Haul roads suitable for plying 100T & 35T class rear dumpers with side drains and dozer path would be provided within the mining area.

➤ Heavy Duty Road

The dumpers deployed in the benches will also go to the workshop for maintenance as well as dump for dumping. Hence a provision for heavy duty road has been made. The type of road suitable for 100T & 35T class rear dumpers would be provided connecting, workshop, dumps etc.

➤ CHPP Infra Road

Bituminous road shall be provided to access various coal handling and coal processing facilities and various service buildings. Road shall be single lane / double lane with shoulders and side drains as per fictional requirement.

➤ Diverted Road

Road connecting to pendrikhi village with Basan village is affected because of mining activity, hence it is proposed to provide diverted road along north and east boundary of Kente block.

Road shall be single lane with shoulders and side drains as per functional requirement.

5.5. Sub-Station

Sub-station has been considered to cater for the requirements of the project. This will be rcc frame structure with brick masonry walls. Necessary doors, window and ventilation shall be provided as per fictional requirements.

5.6. Magazine

Required provision for magazine has been made in the report.

Figure-5.1 Surface Plan

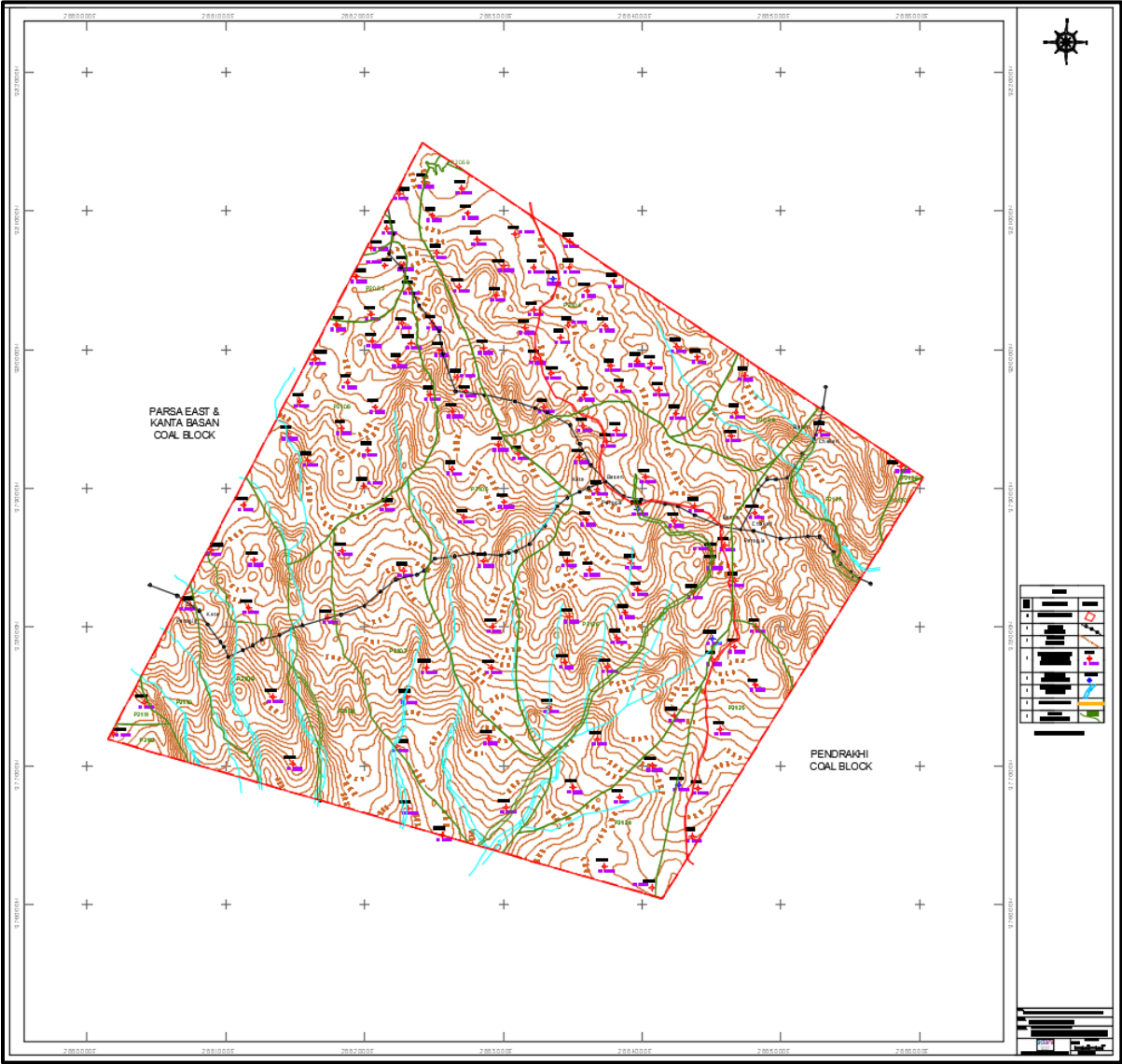


Figure 3 Surface Plan

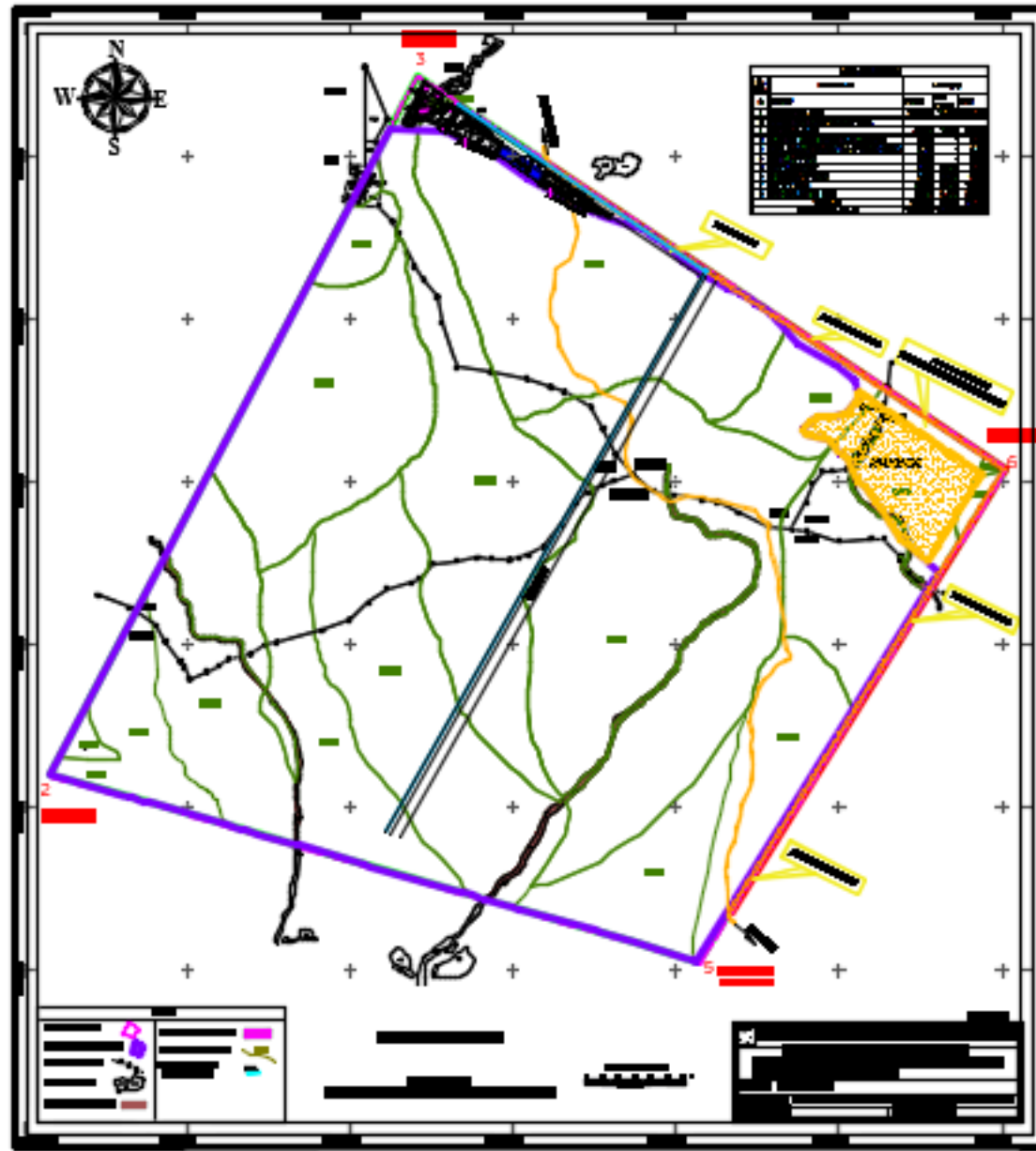


Figure 4 Land Use Plan