

**APPLICATION FOR PRIOR ENVIRONMENTAL CLEARANCE**

**PRE-FEASIBILITY REPORT**

**FOR**

**WEST BOKARO COKING COAL WASHERY  
OF CAPACITY 10.00 MTPA  
IN WEST BOKARO DIVISION OF TATA STEEL LTD.  
(PROJECT AREA - 61.54 HA)**

**at**

**VILLAGE – DUNI, SARUBERA, ATNA, BHADWA & SONDIHA  
TEHSIL – MANDU, DISTRICT - RAMGARH, JHARKHAND – 825314**

***Project Proponent:***



**West Bokaro Division  
M/s. Tata Steel Ltd.**

General Manager Office, Ghatotand,  
Mandu, Ramgarh (Jharkhand) – 825314

***Submitted to***

**Ministry of Environment, Forests & Climate Change (MOEF&CC),  
New Delhi**

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**Contents:**

1. Executive Summary.....	7
2. Introduction of the Project/ Background Information.....	8
2.1. Identification of Project and Project Proponent. In case of mining project, a copy of mining lease/letter of intent should be given. ....	8
2.1.1. Identification of the project .....	8
2.1.2. Identification of Project Proponent.....	8
2.2. Brief Description on the nature of the project .....	9
2.3. Need of the Project and its Importance to the country and or region .....	9
2.3.1. Need of the project .....	9
2.3.2. Importance of project to the country and region- .....	10
2.4. Demand-Supply Gap .....	10
2.5. Imports vs Indigenous production .....	11
2.6. Export Possibility .....	11
2.7. Domestic / Export Markets .....	11
2.8. Employment Generation (Direct and Indirect) due to the project .....	11
3. Project Description .....	12
3.1. Type of the project including interlinked and interdependent project, if any	12
3.2. Location (Map showing general location, specific location, and project boundary & project site layout) with coordinates.....	12
3.3. Details of alternate site considered and the basis of selecting the proposed site, particularly the environmental considerations gone into should be highlighted .....	15
3.4. Size and Magnitude of Operation .....	18
3.5. Project Description with process details (a schematic diagram/ flow chart showing the project layout, components of the project etc. should be given)	18
3.5.1. Crushed Raw Coal transportation .....	19
3.5.2. Tertiary crushing and screening circuit and coal feeding arrangement from Plant Feed bin to Wash Plant:.....	19
3.5.3. Wash Plant: .....	20
3.6. Raw material required along with estimated quantity, likely source and mode	

of transportation of finished Product .....	21
3.6.1. The Product & By product storage & dispatch system.....	21
3.7. Resource Optimization/ Recycling and Reuse envisaged in the project, if any, should be briefly outlined. ....	22
3.8. Availability of Water & its source, Energy/ Power requirement and source should be given .....	23
3.8.1. Water availability and its source.....	23
3.8.2. Power Requirement & its source.....	23
3.9. Quantity of waste to be generated (liquid and solid) and scheme for Management/ disposal.....	23
3.10. Schematic representation of the feasibility drawing which give information for EIA purpose. ....	24
4. Site Analysis .....	25
4.1. Connectivity.....	25
4.2. Land Form, Land Use & Land Ownership .....	25
4.3. Topography (along with map) .....	25
4.4. Existing land use pattern (agriculture, non-agriculture, forest, water bodies (including area under CRZ)), shortest distance from the periphery of the project to periphery of the forest, national park, wild life sanctuary, eco sensitive areas, water bodies (distance from HFL of the river), CRZ. In case of notified industrial area, a copy of the Gazette notification should be given.	26
4.5. Existing Infrastructure .....	26
4.6. Soil Classification .....	27
4.7. Climate data from secondary sources .....	27
4.8. Social Infrastructure available.....	27
5. Planning Brief.....	27
5.1. Planning Concept (type of industry, facility, transportation) Town/Country Planning/ development authority classification.....	27
5.2. Population Projection .....	28
5.3. Land Use planning (Breakup along with Green belt etc.).....	28
5.4. Assessment of Infrastructure Demand (physical & social) .....	29
5.5. Amenities/ Facilities .....	29

6. Proposed Infrastructure .....	29
6.1. Industrial Area (Processing Area) .....	29
6.2. Residential Area (Non-Processing Area) .....	30
6.3. Green Belt .....	30
6.4. Social Infrastructure.....	30
6.5. Connectivity (traffic and transportation road/ rail/ metro/ waterways) .....	30
6.6. Drinking Water Management (source & supply of water) .....	31
6.7. Sewerage System .....	31
6.8. Industrial Waste Management.....	31
6.9. Solid Waste Management .....	31
6.10. Power Requirement & Supply / Source .....	31
7. Rehabilitation and Resettlement (R&R) Plan .....	32
7.1. Policy to be adopted (Central/State) in respect of project affected person including home outsees, land outsees and landless labour (a brief outline to be given).....	32
8. Project Schedule & Cost Estimate .....	32
8.1. Likely date of start of construction and likely date of completion (Time schedule for the project to be given).....	32
8.2. Estimated project cost along with analysis in terms of economic viability of the project.....	32
9. Analysis of Proposal (Final Recommendations) .....	33

**List of Tables**

Table 1 - Brief Details of the Project .....	7
Table 2 - Annual Import of Coking Coal (India) for last 10 Years .....	10
Table 3 - Observations for alternative site examined for new washery.....	16
Table 4 - Quantity of By- Product Generation .....	23
Table 5 - Detail of connectivity .....	25
Table 6 - Existing land use pattern .....	26
Table 7 - Shortest distance from the periphery of the project .....	26
Table 8 - Present land usage .....	28
Table 9 - Proposed land usage for 10.00 MTPA Coal Expansion Project .....	28
Table 10 - Rail & Road connectivity of the proposed project.....	30
Table 11 - Project Implementation Schedule .....	32

**List of Figures**

Figure 1 - Location of the project site (Index Map)..... 13  
Figure 2 - Topo Sheet of the project site ..... 14  
Figure 3 - Study area 10km of project site..... 15  
Figure 4 - Map showing alternatives examined for washery ..... 18  
Figure 5 - Process Flow Diagram of the Project..... 19

## 1. Executive Summary

**Table 1 - Brief Details of the Project**

Sl. No.	Particulars	Description
1.	Name of the Project	West Bokaro Coking Coal Washery of capacity 10.00 MTPA of West Bokaro Division Tata Steel Ltd. in village - Duni, Sarubera, Atna, Bhadwa & Sondiha, Tehsil - Mandu, Dist. - Ramgarh, Jharkhand
2.	Location of the Plant	Village – Duni, Sarubera, Atna, Bhadwa & Sondiha Tehsil – Mandu, District - Ramgarh, Jharkhand – 825314
3.	Proposed Capacity	10.00 MTPA Coking Coal Washery
4.	Category of the Project	“Category A”, Schedule 2 (a) – Coal Washery
5.	Total Land	Total project area is 61.54 ha with 46.83 ha forest land, for which Forest Diversion Proposal has been applied. Rest land has been acquired by Tata Steel Limited.
6.	Washing Technology	Washing Technology – Dense Media Cyclone with froth flotation process
7.	Working hours	6800 hours/ Annum
8.	Total Power requirement & Source	46.64 MW Source: DVC Ramgarh & DG Set of 20 MW (backup)
9.	Manpower	Direct employment of 360 Heads (to be re-deployed from existing projects) Indirect employment 350 Heads (to be re-deployed from existing projects) and Additional employment approx. 350 Heads (Employed through contract during construction phase)
10.	Source of Coal	<ul style="list-style-type: none"> <li>Captive coal mine of Tata Steel Ltd.</li> <li>E-auctions from CIL &amp; its subsidiary mines</li> </ul>
11.	Cost of project for the present proposal	Rs. 1917 Crore
12.	Implementation Period	22 Months
13.	Life of the project	Around 20 Years from the date of Commissioning

## **2. Introduction of the Project/ Background Information**

The proposed project West Bokaro Coking Coal Washery of capacity 10.00 MTPA of Tata Steel Ltd. comprising 61.54 ha area in West Bokaro Division of Tata Steel Ltd. will be located at villages Duni, Sarubera, Atna, Bhadwa & Sondiha, Tehsil – Mandu, District - Ramgarh, Jharkhand – 825314 has been planned with coal linkage from captive coal mine of Tata Steel Ltd. and e-auction from Coal India & its subsidiaries.

The coal throughput of the washery will be 10.00 MTPA on arb (as received basis). The washery will be designed to produce Clean Coal with Middling, Tailing & Reject as by-products.

### **2.1. Identification of Project and Project Proponent. In case of mining project, a copy of mining lease/letter of intent should be given.**

#### **2.1.1. Identification of the project**

In FY21, the total production of crude steel and finished steel in India stood at 102.49 MT and 94.66 MT, respectively. In FY22, crude steel production in India is estimated to increase by 18%, to reach 120 million tonnes, driven by rising demand from customers. The world scenario coupled with strong domestic demand has benefited the Indian steel Industry.

In line with the above, Tata Steel Ltd. has also planned to double its capacity to 35-40 Million tonne by 2030 from the existing 19.6 MT (as on FY 21). To meet the increasing demand of Steel, Tata Steel Ltd. is planning to expand its capacity at Tata Steel Jamshedpur, Tata Steel Kalinganagar, Tata Steel Meramandli & other associated plants.

To meet increasing steel production, domestic coking coal requirement will further increase, for which Coking Coal production from West Bokaro Division need to be increased substantially.

Hence, Tata Steel Ltd. proposes to install West Bokaro Coking Coal Washery of capacity 10.00 MTPA in 61.54 ha area in West Bokaro Division of Tata Steel Ltd. at village – Duni, Sarubera, Atna, Bhadwa & Sondiha, Tehsil – Mandu, District - Ramgarh, Jharkhand – 825314.

#### **2.1.2. Identification of Project Proponent**

Tata Steel Ltd., West Bokaro Division will be the project proponent for the project.



## **2.2. Brief Description on the nature of the project**

Tata Steel Ltd. proposes to construct West Bokaro Coking Coal Washery of capacity 10.00 MTPA at Village – Duni, Sarubera, Atna, Bhadwa & Sondiha, Tehsil – Mandu, District - Ramgarh, State - Jharkhand – 825314. Total land envisaged in the project is 61.54 Ha. The project comprises of the following:

- i. Conveying of Crushed Raw Coal (-75mm) from West Bokaro Mining Lease hold area
- ii. Tertiary Crushing
- iii. Processing of coal in the Main Plant (washery)
- iv. Conveying facility for products viz Clean Coal, Middling, Tailing & Reject.
- v. Storage facility
- vi. Upgradation of existing railway siding for onward dispatch to various consumers.

The coal throughput of the washery will be 10.00 MTPA on arb (as received basis). The washery will be designed to produce Clean Coal with Middling, Tailing & Reject as by-products.

As per Environmental Impact Assessment Notification dated 14<sup>th</sup> September, 2006, and amendments thereafter, the proposed project falls under "Category A", Schedule 2(a), requires Environmental Clearance (EC) to be obtained from MoEF&CC, Government of India, New Delhi.

## **2.3. Need of the Project and its Importance to the country and or region**

### **2.3.1. Need of the project**

The Honorable Prime Minister has proclaimed the global commitment to fight Climate Change; hence the importance of creating the facilities to achieve highest energy efficiency in core sector industries is very essential.

Gap between availability & supply of coking coal of the country has widened during last couple of years, as detailed in section 2.4, resulting in substantial increase in price of good quality coking coal. To meet the increased demand and to bridge the gap between supply and demand, there is a need to enhance production of domestic coking coal. Therefore, it is imperative to expand the mining and beneficiation facilities to bridge the gap as far as possible, thus reducing the coal imports in line with the government's vision of Aatmnirbhar Bharat.

### **2.3.2. Importance of project to the country and region-**

#### **Benefits at national level:**

- i) The washery will produce approx. 4.0 - 5.0 MTPA of steel grade coking coal thus resulting in savings to the national exchequer.
- ii) Middling production for power sector.
- iii) Tailings production for brick kilns & power generation.
- iv) Rejects production for power generation.
- v) Energy conservation by use of latest technology.

#### **Benefits at local level:**

- i) The project will create indirect employment opportunities in the area.
- ii) Enhanced socio-economic benefits to local population due to expenditure on CSR activities.
- iii) Development of tertiary sector industries in and around the proposed project area.

### **2.4. Demand-Supply Gap**

Demand-Supply gap can be understood by total coking coal imported by the country. Annual imports of coking coal for India in the last 10 years is as shown in the table below.

**Table 2 - Annual Import of Coking Coal (India) for last 10 Years**

Year	Coking Coal	
	Quantity (Million tonne)	Value (Million Rupees)
2011-12	31.80	424692.34
2012-13	35.55	378398.09
2013-14	36.87	348318.65
2014-15	43.71	337655.59
2015-16	44.56	282519.09
2016-17	41.64	412300.61
2017-18	47.00	595226.36
2018-19	51.84	720497.64
2019-20	51.83	612668.32
2020-21	51.28	454354.82

Source: <https://coal.gov.in/sites/default/files/2021-01/Import-of-Coal-and-Coke-last-ten-years.pdf>

As indicated in the above table, there is an increasing demand vs supply gap of coking coal in Indian market.

## **2.5. Imports vs Indigenous production**

Currently, Requirement of steel grade coal of Tata Steel Ltd. is being fulfilled by captive coal mines of West Bokaro Division (26%) & Jharia Division (6%). Rest requirement is being fulfilled by imported coal (68%). Further, due to organic and inorganic growth of the company, coking coal requirement of the country as well as of Tata Steel Ltd. will be increased. To meet this requirement, supply of coking coal from West Bokaro Division is planned to increase from existing 2.3 – 2.5 MTPA to 4.0 - 5.0 MTPA.

## **2.6. Export Possibility**

West Bokaro Division's captive coal mine of Tata Steel Ltd. Considering huge demand vs supply gap for domestic coking coal within Tata Steel Ltd., there is no possibility of export from the proposed project.

## **2.7. Domestic / Export Markets**

There is supply vs demand gap of coking coal in the domestic market. This is evident from the import data as mentioned in the section 2.4. Imported coking coal is having lower inherent ash. Indian coal is having inherent high raw coal ash. If the ash is reduced in domestic coal efficiently by beneficiation, the domestic coal will become equivalently good at economic proportion. This will provide support to Aatmnirbhar Bharat Campaign of Government of India.

## **2.8. Employment Generation (Direct and Indirect) due to the project**

- Direct employment of 360 Heads (to be re-deployed from existing projects)
- Indirect employment 350 Heads (to be re-deployed from existing projects) and
- Additional approx. 350 Heads (Employed through contract during construction phase)

This will benefit local population as apart from experts all other workforce is planned to be fulfilled from local population itself.

### **3. Project Description**

#### **3.1. Type of the project including interlinked and interdependent project if any**

As per EIA Notification dated: 14<sup>th</sup> September 2006, the proposed project falls under “*Category A Schedule 2(a) – Coal Washery*”, requires Environmental Clearance (EC) to be obtained from MoEF&CC, Government of India, New Delhi. West Bokaro Coking Coal Washery is dependent on supply of Raw Coal, produced from captive coal mines of Tata Steel Ltd. and subsequently, the washed coal from washery will be supplied to Tata Steel Jamshedpur, Tata Steel Kalinganagar, Tata Steel Meramandli, Tata Steel Long Product and other associated plants.

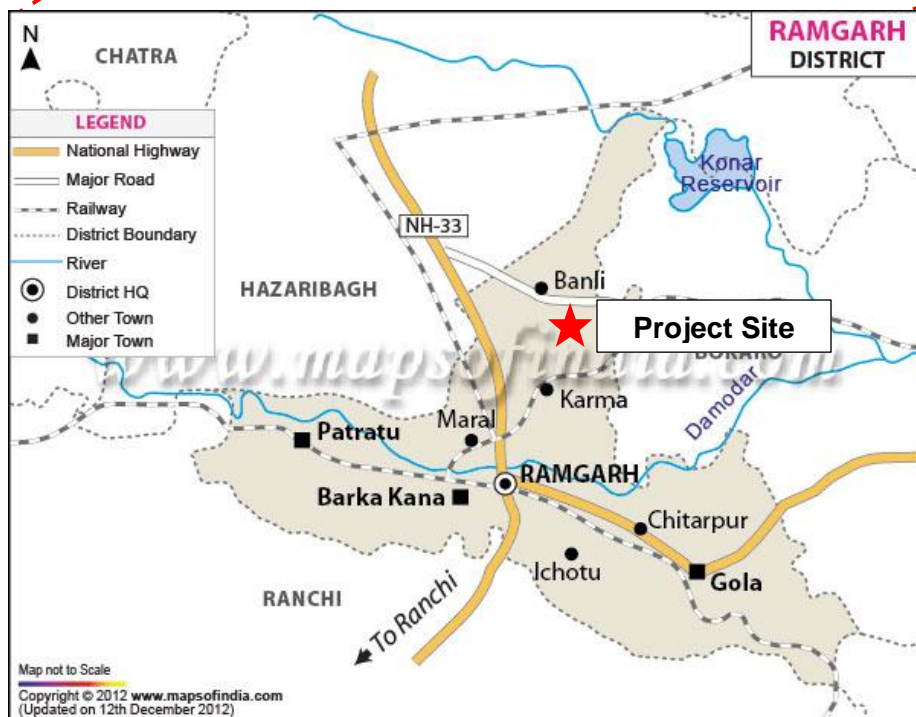
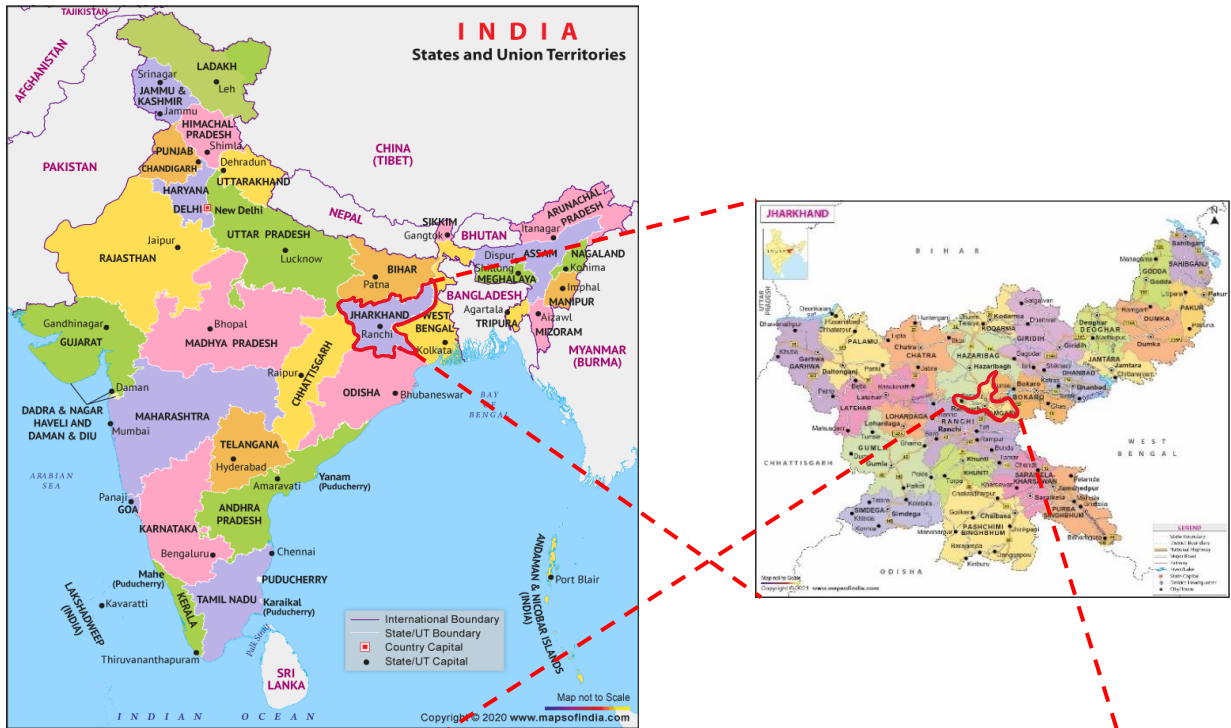
#### **3.2. Location (Map showing general location, specific location, and project boundary & project site layout) with coordinates**

Details of the location are as follows:

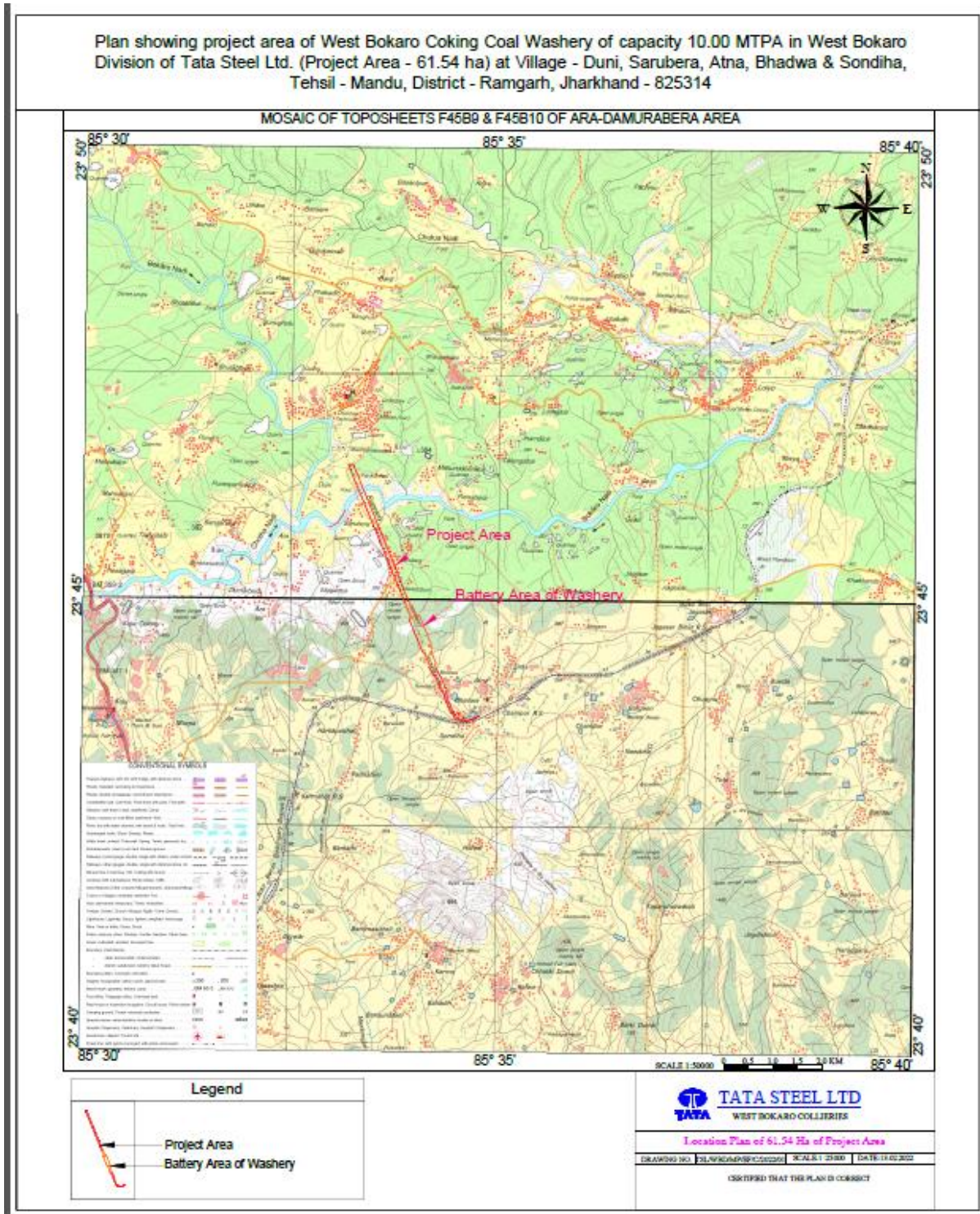
- Village – Duni, Sarubera, Atna, Bhadwa & Sondiha, Tehsil – Mandu, District - Ramgarh, Jharkhand – 825314
- Survey of India Topo sheet no. - F45B9 & F45B10
- Latitude - 23°46'29.85"N to 23°43'39.94"N
- Longitude - 85°33'10.29"E & 85°34'46.41"E

Map showing general location, specific location, and project boundary & project site layout are shown as Figure - 1 (Index Map), Figure - 2 (Toposheet) and Figure - 3 (Study area of the proposed project).

Figure 1 - Location of the project site (Index Map)



**Figure 2 - Topo Sheet of the project site**



**Figure 3 - Study area 10km of project site**



### 3.3. Details of alternate site considered and the basis of selecting the proposed site, particularly the environmental considerations gone into should be highlighted

Existing coal washeries of Tata Steel Ltd. is located inside mining lease hold area of West Bokaro Colliery. The cumulative throughput capacity of these washeries is 7.00 MTPA which complies to its approved EC capacity. However, both the washeries are blocking approximately 60 million tonne mineable coal beneath it. Further, Tata Steel Ltd. is planning to ramp up coal production from 7.00 MTPA to 10.00 MTPA by 2025, for which the capacity of washery needs to be enhanced. Since, current washeries are quite old and blocking substantial coal beneath it and coking coal demand vs. supply gap of the country and Tata Steel Ltd. is increasing. Tata Steel Ltd. proposes to construct a new State-Of-The-Art washery of capacity 10.00 MTPA, adjacent to the existing loading station, outside the leasehold area, for which Environmental Clearance application is being submitted.

Moreover, we have also taken up 5 km radius area from the proposed washery site to explore alternate site. Actually, the area under 5km radius is surrounded by villages, under CCL lease area, commercial & market activities, small township, forest land etc. Observed point are shown in Table 3.

**Table 3 - Observations for alternative site examined for new washery**

<b>Site</b>	<b>Village</b>	<b>Distance</b>	<b>Pros</b>	<b>Cons</b>
1	Kujju	3.5 km	<ul style="list-style-type: none"> <li>• Near to road</li> <li>• Less vegetation nearby</li> </ul>	<ul style="list-style-type: none"> <li>• No surface rights with TSL</li> <li>• Near to forest land</li> <li>• Forest land &amp; Habitation in transportation path</li> <li>• No water availability nearby</li> <li>• Densely populated and market area</li> </ul>
2	Digwar	6.1 km	<ul style="list-style-type: none"> <li>• Near to road &amp; Rail line</li> <li>• Less vegetation nearby</li> </ul>	<ul style="list-style-type: none"> <li>• No surface rights with TSL</li> <li>• Forest land &amp; Habitation in transportation path</li> <li>• No water availability nearby</li> <li>• Densely populated and market area</li> </ul>
3	Chainpur	1.4 km	<ul style="list-style-type: none"> <li>• Near to road</li> <li>• Less habitation nearby</li> <li>• Less vegetation nearby</li> </ul>	<ul style="list-style-type: none"> <li>• No surface rights with TSL</li> <li>• Forest land &amp; Habitation in transportation path</li> <li>• No water availability nearby</li> <li>• Densely populated and market area</li> </ul>
4	Laiyo	5.0 km	<ul style="list-style-type: none"> <li>• Near to river</li> <li>• Less habitation nearby</li> <li>• Less vegetation nearby</li> </ul>	<ul style="list-style-type: none"> <li>• No surface rights with TSL</li> <li>• Central Coalfield Ltd. area</li> <li>• Forest land &amp; Habitation in transportation path</li> <li>• Rainfed river and very less water</li> <li>• Densely populated and market area</li> </ul>
5	Bongahara	4.85 km	<ul style="list-style-type: none"> <li>• Near to road</li> <li>• Less habitation nearby</li> </ul>	<ul style="list-style-type: none"> <li>• No surface rights with TSL</li> <li>• Central Coalfield Ltd. area</li> <li>• Forest land &amp; Habitation in transportation path</li> <li>• No water availability nearby</li> <li>• Densely populated and market area</li> </ul>



In view of the above, the following facts are observed in case of alternate size consideration:

- a. Excess fossil fuel consumption for road transportation.
- b. Excess emissions associated with road transportation such as gaseous pollutants, dust and particulate matter.
- c. Burden on the transport infrastructure such as road and also accidents
- d. Additional land (Forest & Non-forest) will be required to supply raw coal from existing mine to wash plants followed by transportation of washed coal from wash plant to existing Railway Siding.
- e. Additional land (Forest & Non-forest) will be required to supply water from our existing captive mine to wash plants.
- f. Some sites are situated in mining lease of Central Coalfield Ltd. area so it would not be possible to do any activity in those areas.

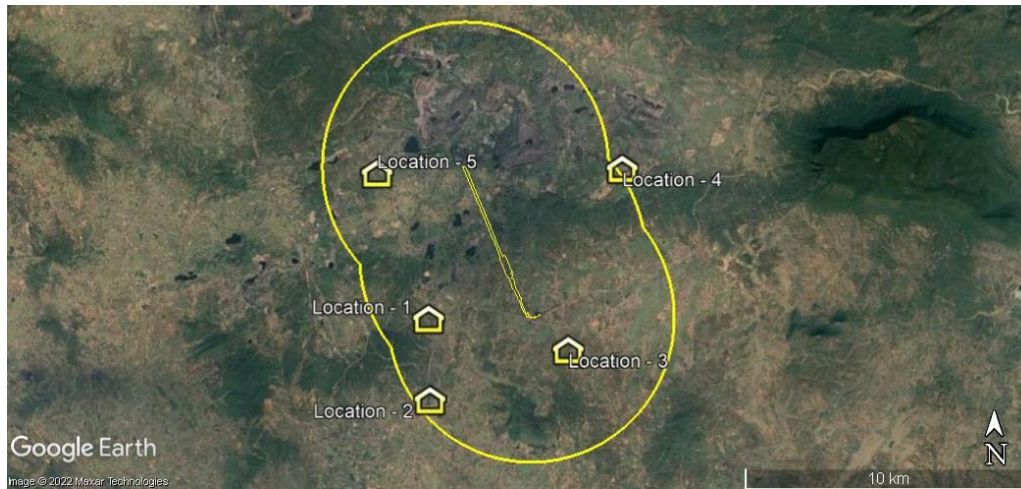
Point no. a, b & c will be resulting in high environmental degradation. if the wash plant is installed at some other location instead of proposed location (TSL owned land) then point no. d & e will be resulting in disturbance and deforestation of additional forest land. As per point no. f, it is not possible to install new wash plant in nearby area. Therefore, in order to avoid the degradation of Environmental parameters and degradation of additional forest and non-forest land for the project, the proposed site was envisaged.

The justification for locating the new washery in the identified area is on account of the of the fact:

- i) The site will be closest to the captive coal mine of Tata Steel Ltd. and coal from mine to the washery will be conveyed through conveyer belt to avoid air pollution.
- ii) That, a major portion of area currently being used for transportation of coal from West Bokaro Coal Mine will be utilized for construction of washery.
- iii) That, the project area is linked to captive coal mine, where we have stored sufficient water in our mine out pits and in rainwater harvesting reservoirs. As coal washing requires significant water, the proposed project area will facilitate laying of pipes from water reservoir to new washery.

We would like to mention that the setting of a proposed washery at any other location is not feasible, as availability of land and water is limited. Such an exercise would potentially inflict greater loss of natural resources such as standing trees, would cause environmental damage due to road transport, would incur huge costs of transport and would render a large investment which is already in place at the existing facility as in fructuous. As such, the alternate option neither environment friendly nor economical. Map showing alternate location is shown in Figure 4.

**Figure 4 - Map showing alternatives examined for washery**



### 3.4. Size and Magnitude of Operation

The proposed washery is 10.00 MTPA coal wash plant expected to remain for remaining life of the project.

### 3.5. Project Description with process details (a schematic diagram/ flow chart showing the project layout, components of the project etc. should be given)

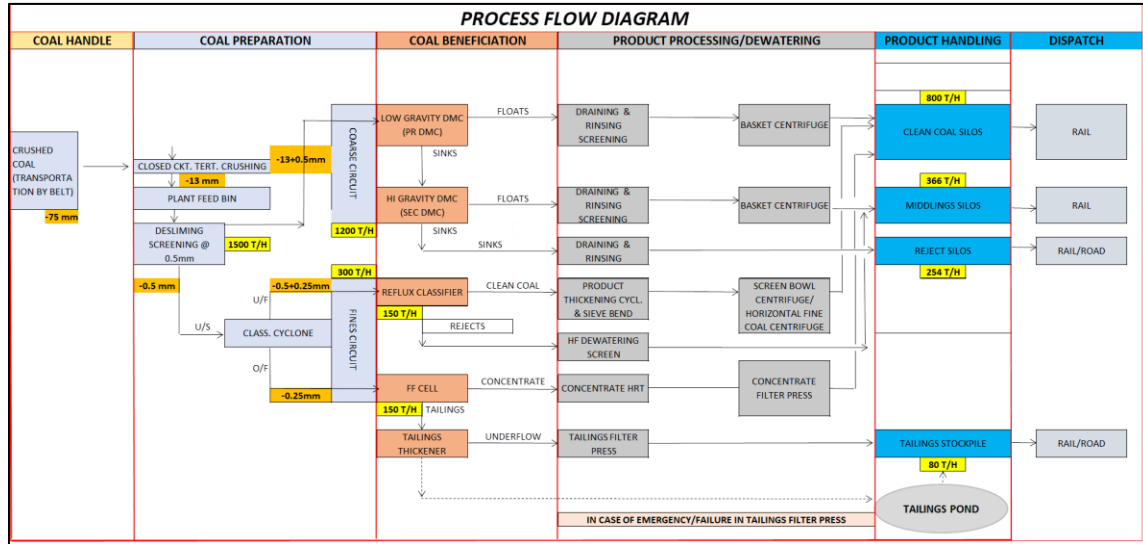
The project is a State-Of-The-Art new wash plant with other facilities for reduction of coal ash to produce coking coal for use in Blast Furnace. The project comprises of the following:

- i) Conveying of crushed raw coal (-75mm) from captive coal mine lease hold area
- ii) Tertiary crushing (-75 +13) mm
- iii) Wash plant including:
  - a) Coarse Circuit (-13 + 0.5) mm
  - b) Intermediate Circuit (-0.5 + 0.25) mm
  - c) Fines circuit -0.25 mm
- iv) Conveying facility for Clean Coal & by-products
- v) Storage facilities
- vi) Upgradation of existing railway siding

## Process Flow Diagram –

Brief Block-flow diagram of entire facilities coming from ROM to Product and By-Product dispatch system is shown in Figure 5.

**Figure 5 - Process Flow Diagram of the Project**



### 3.5.1. Crushed Raw Coal transportation

Crushed coal (-75 mm) is stored in the silo with a sufficient buffer to decouple the intermittent mining operation. This coal is transported to the project area via belt conveyors to tertiary crushing section.

### 3.5.2. Tertiary crushing and screening circuit and coal feeding arrangement from Plant Feed bin to Wash Plant:

Crushed coal from storage silo is fed to closed circuit tertiary crushing system where -75 mm is screened in feed screen (13mm aperture size) and oversize of this screen reports to Impact Crusher (tertiary crusher) to crush down to -13 mm. The product of tertiary crusher along with feed screen undersize is conveyed to Wash Plant feed bin.

Location of crushed coal storage system and tertiary crusher should be preferred nearer to wash plant. Raw coal of -13mm size will be stored in Plant Feed Bins which will be required to decouple CHP operation with wash plant. *-75 mm crushed coal from secondary sizer is conveyed to coal silo through long pipe conveyor (LPC).*

### **3.5.3. Wash Plant:**

In the wash plant, the coal (-13mm) which comes from coal plant feed bin is de-slimed at 0.5mm. The oversize coal (+0.5mm) of screen, coarse coal processed in Dense Media Cyclone whereas, -0.5mm fraction from undersize of de-sliming screen will pass through classifying cyclone to separate in two size envelopes; -(0.5+0.25) mm and -0.25mm. These sizes of coal particles are processed in Intermediate and Flotation Circuit respectively. Hence, there will be three streams as mentioned below:

- a) Coarse coal circuit: size (-13 + 0.5) mm
- b) Intermediate circuit: Size (-0.5 + 0.25) mm
- c) Fines circuit: Size -0.25 mm

#### **Coarse Circuit:**

The oversize (-13+0.5) mm of the de-sliming screen is treated in two stages of washing in Dense Media Cyclones (DMC). The Primary DMC operates at lower cut gravity and the secondary one is operated at higher cut to separate three products as Coarse Clean Coal, Middling and Rejects. Coarse circuit also includes media charging and recovery circuit where Media from coal slurry coming from DMC passes through Sieve Bend, Drain and rinse screen and recovered from Primary and Secondary Drum Magnetic Separator. Dewatering of coarse Coal products are done in Centrifuge after passing through Draining & Rinsing Screens.

#### **Intermediate Circuit:**

The coal particles of (-0.5+0.25) mm size fraction coming from classifying cyclone underflow are treated in Reflux Classifier (RC). The clean coal obtained from RC is dewatered through combination of dewatering cyclone with sieve bend and finally through Screen Bowl Centrifuge. Fines Clean Coal obtained from centrifuge, mixed on conveyor carrying coarse clean coal. The rejects obtained through RC underflow is fed to High frequency screen for dewatering and mixed on conveyor carrying coarse Middling/Rejects based on quality required of by-products.

#### **Fine Circuit:**

Fine coal (-0.25 mm) coming from overflow of classifying cyclone are treated in flotation cell, where clean coal is collected with froth and tailings as discard. Dewatering of clean coal fine is done through combination of concentrate HRT and Filter Press. Clean Coal cake obtained from Filter Press, mixed on conveyor carrying coarse Intermediate size clean coal. Filtration of Tailings is done through combination

of Tailings High Rate Thickener (HRT) and Filter Press. The overflow water from Tailings HRT is used as recycled water through process water tank.

### **Conveying facility for coal and by-products**

The crushed coal -75 mm will be transported from the captive coal mine lease hold area through ropeways and conveyor belt circuit to the tertiary crushing unit and subsequently to the wash plant. The clean coal and by products from the wash plant will be transported to the railway siding/ respective storage facility by conveyor system. Storage facility of final product will be as stated in the subsequent section.

### **3.6. Raw material required along with estimated quantity, likely source and mode of transportation of finished Product**

The crushed coal from captive coal mine of Tata Steel Ltd. will be used to feed the West Bokaro Coking Coal Washery. The plant will also use the coal secured from e-auctions from Coal India Limited & its subsidiary mines in the region.

(-)75mm crushed coal is stored in the silo with a sufficient buffer to decouple the intermittent mining operation with primary crusher operation. Raw coal from storage silo is fed to closed circuit tertiary crushing system where -75mm is screened in feed screen (13 mm aperture size) and oversize of this screen reports to Impact Crusher (tertiary crusher) to crush down to -13 mm. In the Wash Plant, the raw coal (-13mm) which comes from tertiary crushing is beneficiated through coarse circuit, Intermediate circuit & Fines Circuit beneficiation.

#### **3.6.1. The Product & By product storage & dispatch system**

Wash Plant will produce four products. The quality of each product, as targeted is describe below:

- a) Clean Coal: -13mm size, 13 to 18 % Ash (air dry basis)
- b) Middling: -13mm +0.25mm size, 34-42% Ash (air dry basis)
- c) Tailings Filter Cake: -0.25mm size, >32% Ash (air dry basis)
- d) Rejects: -13mm +0.25mm size, >55% Ash (air dry basis)

#### **Clean Coal Storage & Transportation**

Clean coal yield from washery shall be conveyed and stored in the clean coal storage silos. Clean coal from silos shall be evacuated by bin extractors and conveyed to RLS-1/2, on case-to-case basis.

### **Middling Storage & Transportation**

Middling coal yield from washery shall be conveyed and stored in the Middling coal storage silos. Middling coal from silos shall be evacuated by bin extractors and conveyed to RLS-1/2, on case-to-case basis.

### **Tailing Storage & Transportation**

Tailings filter cakes from the washery shall be conveyed and stored on ground for natural drying. Tailings shall be mixed with middling or rejects (as and when required) and shall be loaded in railway / trucks and dispatched to buyers.

### **Reject Storage & Transportation**

Reject coal yield from washery shall be conveyed and stored in the reject coal storage silos. Reject coal from silos shall be evacuated by bin extractors and conveyed to RLS-1/2 or shall be loaded in Railway/trucks and dispatched to buyers, on case-to-case basis.

### **Loading and Dispatch System**

For uninterrupted dispatch of product coal to Rapid Loading Station (RLS), coal silos have been envisaged. These silos will receive material from product coal silos (clean/middling & rejects) and convey them to RLS-1/RLS-2 for dispatch through rail.

### **Tailing Pond**

The underflow of thickener will be pumped to tailings filter press for further dewatering. The filter cake discharged from tailings filter press is envisaged to be stored in tailing's stockpile. In case the tailings filtration unit is down due to any issue, the underflow of this thickener will be pumped to tailings pond.

### **3.7. Resource Optimization/ Recycling and Reuse envisaged in the project, if any, should be briefly outlined.**

The proposed project is a zero liquid discharge plant. Coal supplied from various sources are fed to the plant. Plant operates in variable density to cater to beneficiation requirement. Thus, plant can handle all types of coal fed to it.

The proposed washery will be having reflux circuit to recover clean coal from tailings, which'll result in resource optimization.

Water from tailing dewatering plant and tailings ponds will be recycled back to washery circuit as process water.

The clean coal, generated from the plant, is supplied to steel plants of Tata Steel Ltd. & various by-products generated by the plant are supplied to respective buyers. All the products are saleable and having market value and hence the plant operates on zero waste.

### **3.8. Availability of Water & its source, Energy/ Power requirement and source should be given**

#### **3.8.1. Water availability and its source**

Source of raw water will be Mined out pit Reservoir & Mine Water, located at West Bokaro Tata Steel lease hold area.

#### **3.8.2. Power Requirement & its source**

The requirement of power in the proposed project will be around 46.60 MW. 220 kV transmission line from DVC Ramgarh sub-station to the project site is proposed. MRSS shall be constructed for facilitate the same. Provision for 20 MW DG has also been kept for emergency power back.

### **3.9. Quantity of waste to be generated (liquid and solid) and scheme for Management/ disposal**

The proposed washery would be designed to produce clean coal at 13% to 18% ash. Accordingly, by-products would be generated as per the table below.

**Table 4 - Quantity of By- Product Generation**

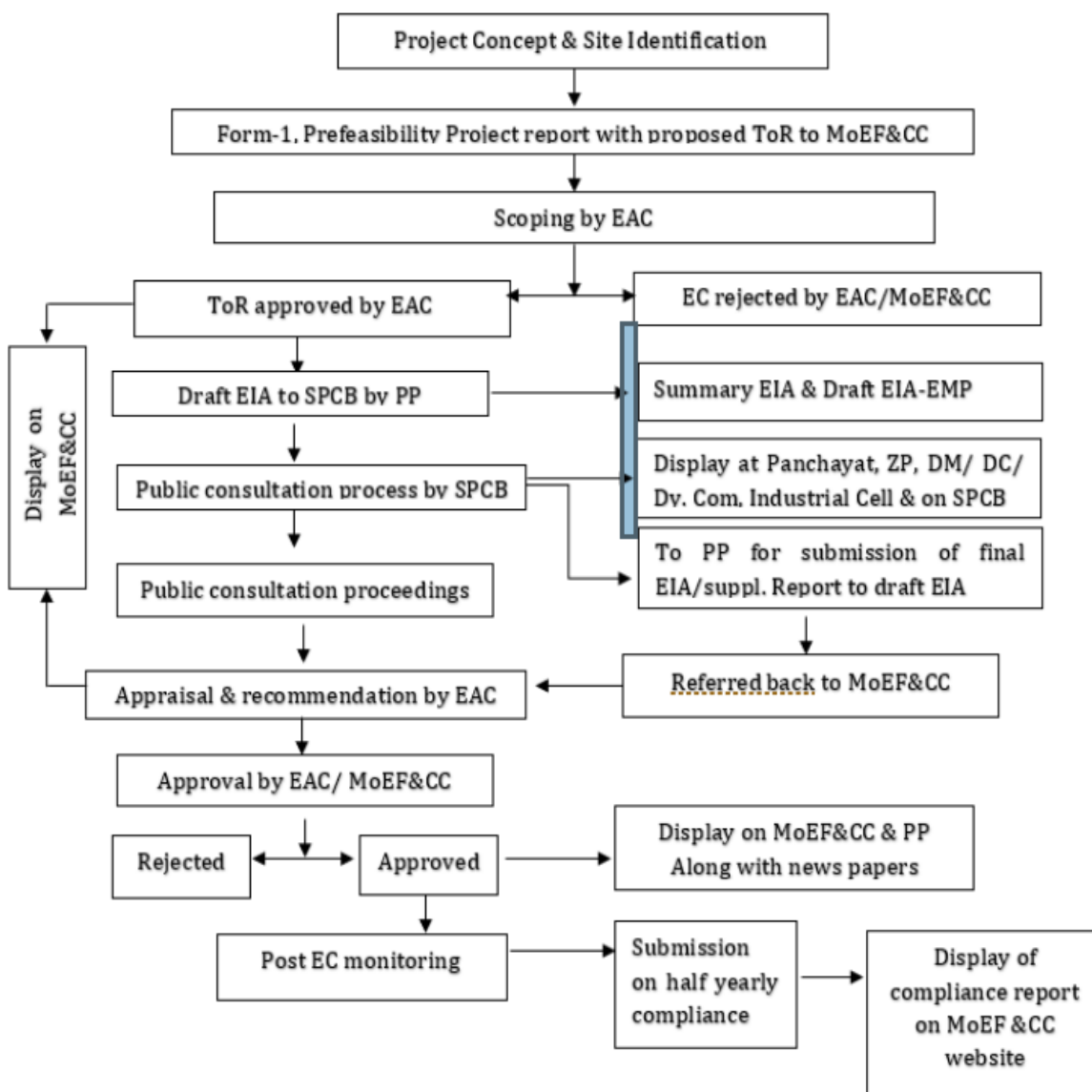
<b>Details</b>	<b>Quantity (Million Tonne/ Year)</b>
Middling	3.5 - 4.0
Tailing	1.5 - 2.0
Reject	1.1- 1.4

All the by-product from the proposed washery will be sold in the market. Hence, there is effective zero waste generation from the said project.

### Wastewater generation and disposal:

The process water is recirculated through conventional thickener. Tailings will be fed to tailing dewatering plant, from where the dewatered water is pumped back as process water after settlement of solid part. Hence, there is no liquid discharge from wash plant.

### 3.10. Schematic representation of the feasibility drawing which give information for EIA purpose.





## **4. Site Analysis**

### **4.1. Connectivity**

The proposed site is well connected from Rail & Road Network.

**Table 5 - Detail of connectivity**

<b>Sl. No.</b>	<b>Mode of transportation</b>	<b>Detailed Description</b>
1.	Railway	1.4 Kms from Chainpur Railway Station
2.	Road	7.8 Kms from NH-33 and 65 Kms from State Capital (Ranchi)
3.	Airport	68 Kms via NH-33 from Birsa Munda Airport, Ranchi

### **4.2. Land Form, Land Use & Land Ownership**

Total project area is 61.54 ha with 46.83 ha forest land, for which Forest Diversion Proposal has been applied. Rest land has been acquired by Tata Steel Limited. Present land use type is already industrial.

### **4.3. Topography (along with map)**

The project is located within survey of India toposheet no. - F45B9 & F45B10. The area is mostly flat. The corridor extends in NNW - SSE direction and is bounded by West Bokaro Open Cast Coal Mine leasehold in the north and Chainpur Railway Station in the south. Detailed map of the area is shown in Figure-2.

#### **Drainage Pattern:**

The project area is mostly flat. Bokaro Nadi traverse from the northern flank of the project area.

#### **Vegetation:**

The project area is mainly devoid of vegetation and is occupied by arial ropeway & conveyor.

**4.4. Existing land use pattern (agriculture, non-agriculture, forest, water bodies (including area under CRZ)), shortest distance from the periphery of the project to periphery of the forest, national park, wild life sanctuary, eco sensitive areas, water bodies (distance from HFL of the river), CRZ. In case of notified industrial area, a copy of the Gazette notification should be given.**

Following table present the existing land use pattern (as on 01.01.2022)

**Table 6 - Existing land use pattern**

<b>Sl. No.</b>	<b>Description</b>	<b>Total (Ha)</b>
1.	Forest	46.83
2.	Non – Forest	14.19
3.	Water body	0.52
<b>Total =</b>		<b>61.54</b>

**Table 7 - Shortest distance from the periphery of the project**

<b>Sl. No.</b>	<b>Location</b>	<b>Distance (km)</b>
1.	Forest	Within project area
2.	Hazaribagh National Park	66
3.	Hazaribagh Wildlife Sanctuary	66
4.	Eco-sensitive areas (Dalma Wildlife Sanctuary)	115
5.	Water bodies	Within project area

**4.5. Existing Infrastructure**

Presently the area has the following infrastructures:

- Network of Arial Ropeway & conveyors for transportation of washed coal from captive coal mine leasehold area to chainpur railway siding area.
- Clean Coal and Middling bins & storage area with network of conveyor.
- Quality check Laboratory
- Quick loading complex for wagon loading at railway siding.
- Office structures, workshop, store, canteen and rest shelters etc.
- Access roads network

#### **4.6. Soil Classification**

The distribution of different soil types of the area depends much on its physiographic and lithologic variations. Textural class is found to be clay loam. The soil quality at this location would support vegetation.

#### **4.7. Climate data from secondary sources**

The climate of the area is tropical. The winter season starts from December and continues till the end of February. January is the coldest month with the minimum temperature at 4.4°C. The temperature starts increasing rapidly during the onset of pre-monsoon season from March to May. During pre-monsoon season, the maximum temperature was observed 47.8°C with the minimum temperature 16.8°C. The maximum temperature in the monsoon season was observed to be 33.4°C, whereas the minimum temperature was observed 21.8°C. In the post-monsoon, day temperature decreases slightly with the maximum temperature 28.9°C. Rainfall is moderate and ranges from 830 mm to 1545 mm averaging to 1150 mm per annum. The average relative humidity values are in the range of 30.00 % to 86.00 %. Mostly clear sky is predominant during the study period. Nearest meteorological station is located at Ranchi.

#### **4.8. Social Infrastructure available**

There is no residential or social infrastructure area within the core area of the project and the area is belonging to Tata Steel Ltd. There is no likelihood of effect of outside people or influx on existing local population.

Tata Steel is spending substantial amount through Tata Steel Foundation for peripheral developments such as education, health, sports, afforestation etc. Hence the benefits to the community and its economy because of this project are quite appreciable.

### **5. Planning Brief**

#### **5.1. Planning Concept (type of industry, facility, transportation) Town/Country Planning/ development authority classification**

The proposed new State-Of-The-Art coking coal washery and associated infrastructure is under West Bokaro Division of Tata Steel Ltd. with an annual capacity of 10.00 MTPA, which will be in the village – Duni, Sarubera, Atna, Bhadwa & Sondiha, Tehsil – Mandu, District - Ramgarh, Jharkhand – 825314.

The crushed coal will be received from captive coal mine leasehold area and will be washed in the new wash plant. It is also proposed to enhance conveying capacity from crusher house to washery to handle additional load of coal. Loading system at Chainpur railway siding will also be augmented to handle the additional load of washed coal & simultaneously additional storage capacity will also be created at siding.

## 5.2. Population Projection

The proposal is to establish West Bokaro Coking Coal Washery of capacity 10.00 MTPA. No additional manpower is anticipated for employment with the project in the long term. The nearby area is having saturated population. During life of the project, people in secondary & tertiary secondary sector are expected to remain same and hence there is little likelihood of increase in population in the study area.

## 5.3. Land Use planning (Breakup along with Green belt etc.)

Proposed land use plan is as shown in the table below. The project is proposed to have green belt around the project.

**Table 8 - Present land usage**

Sl. No.	Description	Area (ha)
1.	Ropeway/ conveyor with road and maintenance area with green coverage	33.58
2.	Infrastructure with stockpile	15.61
3.	Railway Siding with maintenance area	11.83
4.	Water body	0.52
<b>Total =</b>		<b>61.54</b>

**Table 9 - Proposed land usage for 10.00 MTPA Coal Expansion Project**

Sl. No.	Description	Area (ha)
1.	Ropeway/ conveyor with road and maintenance area	7.94
2.	Washery with Infrastructure	32.78
3.	Railway Siding with maintenance area	14.30
4.	Water body	0.52
5.	Green Belt	6.00
<b>Total =</b>		<b>61.54</b>

#### **5.4. Assessment of Infrastructure Demand (physical & social)**

The proposal is for installation of a new State-Of-The-Art coal washery. However, some infrastructures like road, ropeways, conveyor networks, railway siding are in place to cater the need of present, which'll be augmented to cater the need of the future.

The proposed project area is in the close proximity of West Bokaro Colliery leasehold area being operated by Tata Steel Ltd. The company is already working in the proposed project area under corporate social responsibility programs. Tata Steel Ltd. has assessed the increased requirement of infrastructure (Physical & Social) in the nearby area of the project site.

#### **5.5. Amenities/ Facilities**

Following amenities are exists within the project:

- Rest Shelter
- Canteen
- Toilets
- Drinking water storage facility
- First Aid station

The area is well connected via road (within 5 Kms) to the Tata Steel owned township of West Bokaro Division, Tata Steel Ltd. All the other facilities such as TSL owned hospital for initial & periodic health check-up of employees, Fire Station with fire tenders are available at township of West Bokaro Division.

However, Tata Steel Ltd. has accessed the requirement of additional amenities in the proposed project area and ramp of the same will be done accordingly.

### **6. Proposed Infrastructure**

#### **6.1. Industrial Area (Processing Area)**

The area is presently in use for ropeway and conveyor network, storage areas, Quick Loading complex and Railway Siding for transportation of coal & its product. The proposed area will have following industrial infrastructure

- Washery with associated infrastructure
- Augmented Railway Siding with maintenance area to cater the future need
- Ropeway and belt conveyor network with road & maintenance Area

## **6.2. Residential Area (Non-Processing Area)**

There is no residential area present. Also, no residential area is proposed in the project area.

## **6.3. Green Belt**

Green belt will be developed in all the available area in an around the project area. Battery Area of the proposed washery is approx. 19.7 ha and proposed green belt is about 6 ha as per table 9. The multi-species bio-diversified sapling planted will ensure the development of green cover that will match the natural vegetation around. Species like Siras (*Albizia lebbeck*), Semar (*Bombax ceiba*), Chironji (*Buchanania lanzan*), Sisam (*Dalbergia sissoo*), Kend/Tendu (*Diospyros montana*) etc. which can survive and re-generate in the area, shall be planted. Temporary fencing shall be provided for safeguarding the sapling from grazing. Watering & Guarding shall be done for two to three years.

## **6.4. Social Infrastructure**

Tata Steel is spending substantial amount through Tata Steel Foundation for peripheral developments such as education, health, sports, afforestation etc. These will be further strengthened by Tata Steel Ltd.

## **6.5. Connectivity (traffic and transportation road/ rail/ metro/ waterways)**

The area is well connected by Road & Rail network.

**Table 10 - Rail & Road connectivity of the proposed project**

<b>Sl. No.</b>	<b>Mode of transportation</b>	<b>Detailed Description</b>
1.	Railway	1.4 Kms from Chainpur Railway Station
2.	Road	7.8 Kms from NH-33 65 Kms from State Capital (Ranchi)

The road network is further planned to be strengthened to cater to the requirement of the transport of man & material from the said project. There is planned upgradation of Chainpur Railway siding with Rapid Loading System.

## **6.6. Drinking Water Management (source & supply of water)**

Drinking water is being provided in the area. However, with the expected surge in working population in the area the drinking water supply and storage is planned for upgradation to meet the requirement. All the overhead tanks have been fitted with floating valves to prevent overflow of water, thus minimizing wastage.

Drinking water will be sourced from mine water stored in mined out pit reservoir and will be used post its processing from water treatment plant.

## **6.7. Sewerage System**

There is no domestic colony existing within the project area nor it is proposed. The domestic discharges from offices & canteen will be treated in Sewage Treatment Plant (STP). Construction of the same is proposed along with the project. The treated water from STP will be reused for horticulture purpose.

## **6.8. Industrial Waste Management**

The proposed project is a zero liquid discharge unit. Further, by-products generated during washing process are saleable and having market value. The water discharge from the plant is planned to be recollected from various circuits as Tailing dewatering plant, concentrate pressure filters, desliming screens etc. and reused in the plant itself.

However industrial waste generated in smaller quantity such as used oils, cotton etc. will be disposed-off as per norms.

## **6.9. Solid Waste Management**

All the by-products are saleable and having market value and hence the plant operates on zero waste.

## **6.10. Power Requirement & Supply / Source**

The requirement of power in the proposed project will be around 46.60 MW. 220 kV transmission line from DVC Ramgarh sub-station to the project site is proposed. MRSS shall be constructed to facilitate the same. Provision for 20 MW DG has also been kept for emergency power back-up.

## **7. Rehabilitation and Resettlement (R&R) Plan**

### **7.1. Policy to be adopted (Central/State) in respect of project affected person including home outsees, land outsees and landless labour (a brief outline to be given)**

No R&R plan is required as no displacement of people is anticipated in the proposed project.

## **8. Project Schedule & Cost Estimate**

### **8.1. Likely date of start of construction and likely date of completion (Time schedule for the project to be given)**

**Table 11 - Project Implementation Schedule**

<b>Sl. No.</b>	<b>Description</b>	<b>Implementation Period</b>
1.	In House Basic Engineering	Ongoing (up to Dec 2021)
2.	Study & validation of Basic Engineering	6 Months (Jan-22 to May 22)
3.	Detailed Engineering	9 Months (Jun-22 to Feb-23)
4.	Construction	After EC & CTE of 10 MTPA, 19 Months (Nov-22 to May-24)
5.	Commissioning & Hand Over	3 Months (Jun-24 to Sept-24)

### **8.2. Estimated project cost along with analysis in terms of economic viability of the project**

Total cost of the project is Rs 1917 Cr.



## **9. Analysis of Proposal (Final Recommendations)**

The proposed State-Of-The-Art 10.00 MTPA Coking Coal Washery will be financially and socially beneficial considering the project cost, environmental cost, cost on health & safety and the various community improvement activities planned.

On overall assessment of the project with technical and financial aspects, it is concluded that the proposed project of Coking Coal Washery is technically feasible and financially viable.

The project is planned as near as possible to the existing captive coal mine will be resulting in minimizing the environmental degradation.

Project is proposed in the Forest Land and applications of Forest Diversion are already in process vide proposal no. FP/JH/IND/142974/2021 (51.65 ha) & FP/JH/MIN/814/1998 (9.89 ha). The project is proposed to be approved subjected to the prior Forest Diversion from the proposed area.

A sincere approach will be adopted for the Air Pollution Control and Resource conservation by recycling the 100% wastewater also gives the additional advantage to the company.

Employments will be generated within the plant and outside the plant in the form of direct and indirect employments. This Coking Coal Washery will provide employment for around 350 people by indirect employment in the form of contractual works & during construction and commissioning phase.

The project proponent will extend social benefits like health, education, infrastructure development and environment conservation.

In view of these factors, it is fully recommending the project as technically feasible, environmentally safe and financially viable.

**Acknowledgement of Forest Diversion proposal no.  
FP/JH/IND/142974/2021 (51.65 ha)**

This is to acknowledge that a proposal seeking prior approval of Central Government under the Forest (Conservation) Act 1980 as per the details given below has been successfully uploaded on the portal of the Ministry of Environment, Forests and Climate Change Government of India.

1. Proposal No. : FP/JH/IND/142974/2021
2. Proposal Name : West Bokaro Expansion Project
3. Category of the Proposal : Industry
4. Date of Submission : 22/10/2021
5. Name of the Applicant with Contact Details  
  
Name : Manoj  
Mobile No. : 9234500872  
State : Jharkhand  
District : Ramgarh  
Pincode : 825314
6. Area Applied (ha.) : 36.94

The proposal will be examined by the Nodal Officer, Forest (Conservation) Act, 1980 to assess its completeness.

(System Administrator)

\*\*\* This is a system generated email, please do not reply. \*\*\*

West Bokaro Coking Coal Washery of capacity 10.00 MTPA in West Bokaro Division of Tata Steel Ltd. (Project Area - 61.54 ha) at Village – Duni, Sarubera, Atna, Bhadwa & Sondiha, Tehsil – Mandu, District - Ramgarh, Jharkhand – 825314

**Pre-Feasibility Report**

**Proof of Stage I Compliance submission of Forest Diversion proposal no. FP/JH/MIN/814/1998 (9.89 ha).**

*recd  
ms  
10/5/19*



Divisional Forest Officer  
Ramgarh Division  
Ramgarh

WBD/EMC/4003/046/19  
08<sup>th</sup> May, 2019

Sub.: Forest diversion proposal of 9.8866 ha. of forest land at village Atna, Mandu, Ramgarh, West Bokaro Colliery, Tata Steel Ltd.

Ref.: Your letter No.2311 dt.13.9.2017 & letter No. 822 dt. 8.9.17 by CF cum Dy. Director, Waste land Development Board, Jharkhand, Ranchi. Letter of GOI MoEF CC Forest Division No. F.No. 11-125/2017-FC dt.25.08.17 & your letter no.1089 dt.08.05.19  
Our letter no. WBD/EMC/4003/92/17 dt.15.09.17, WBD/EMC/4003/007/18 dt.29.01.18 & letter no. WBD/EMC/4003/006/19 dt.16.01.19

Dear Sir,

Reference to the subject as cited above, we wish to state that the compliance report of stage –I clearance of above proposal submitted vide above mentioned letter to your good office was incomplete. Therefore, we enclosed herewith updated compliance report of the conditions as mentioned in the letter for your kind consideration and favorable action. We request you to kindly acknowledge the same and take it forward to obtain stage –II clearance.

Thanking you,

Yours sincerely,

*Sanyal*  
General Manager (Coal)  
West Bokaro Colliery  
Tata Steel Ltd.

Encl.: Compliance report in 8 sets.