FORM1

(I) Basic Information

S. No.	Item	Details
1.	Name of the project	**1320** MW (2x660) Super Critical Thermal Power Project at Patratu in Ramgarh district of Jharkhand.
2.	S. No. of the schedule	1 (d)
3.	Proposed capacity/ area/ length/ tonnage to be handled/ command area/ lease area/ number of wells to be drilled	Capacity - 1320 (2x660) MW Area – Approximately 1050 Acres Raw material – Approximately 6.33 MTPA Indigenous Coal considering coal GCV of 3600 kCal/ kg at 85% PLF
4.	New / Expansion/ Modernization	New Project
5.	Existing Capacity/ Area etc.	Not Applicable
6.	Category of Project i.e. 'A' or 'B'	'A' (Thermal Power Plant, Capacity≥500 MW)
7.	Does it attract the general condition? If yes please specify.	Not Applicable
8.	Does it attract the specific condition? If yes please specify.	Not Applicable
9.	Location	Latitude 23°36'49.65- 23°37'20.14"N- Longitude 85°15'58.34"- 85°16'44.61"- E-. Location Plan attached as **Annexure-I**
	Plot/ Survey/ Khasra No.	-
	Village	Patratu
	Tehsil	-
	District	Ramgarh
	State	Jharkhand
10.	Nearest Railway Station/ Airport alongwith distance in kms.	Patratu Railway Stations –5 km from site Ranchi Airport- 45 km
11.	Nearest Town, city, District Headquarters alongwith distance in kms.	Nearest Town - Patratu (2.7 km) Nearest City - Ramgarh (30 km) District Headquarters - Ranchi (40 km)
12.	Village Panchayats, Zila Parishad, Municipal Corporation, Local body (complete postal addresses with telephone nos. to be given)	District – Ramgarh
13.	Name of the Applicant	Patratu Energy Limited
14.	Registered Address	JSEB Campus, Engineering Building, HEC, Dhurwa, Ranchi – 834 004
15.	Address for correspondence	
	Name	Anjani Kumar
	Designation (Owner/ Partner/ CEO)	Chief Engineer (Projects)
	Address	JSEB Campus, Engineering Building,

S. No.	Item	Details
		HEC, Dhurwa, Ranchi – 834 004
	Pin Code	834004
	E-mail	akjseb@gmail.com
	Telephone No.	08986800039
	Fax No.	0651-2400799/ 2400483
16.	Details of alternative Sites examined, if any Location of these sites should be shown on a topo sheet.	The land is already in possession with JSEB for Thermal power plant, thus no alternate sites have been analyzed for the proposed project.
17.	Interlinked Projects	Not Applicable
18.	Whether separate application of interlinked project has been submitted?	Not Applicable
19.	If yes, date of submission	Not Applicable
20.	If no, reason	Not Applicable
21.	Whether the proposal involves approval/ clearance under: if yes, details of the same and their status to be given. (i) The Forest (Conservation) Act, 1980. (ii) The wildlife (Protection) Act, 1972 (iii) The C.R.Z. Notification, 1991	Not Applicable
22.	Whether there is any Government Order/ Policy relevant/ relating to the site?	Not Applicable
23.	Forest Land involved (hectares)	No Reserved Forest or Protected Forests is involved. Only the Land in possession of owner will be utilized for project purpose
24.	Whether there is any litigation pending against the project and/or land in which the project is propose to be set up? (a) Name of the court (b) Case No. (c) Orders/ directions of Court, if any and its relevance with the proposed project.	No

(II) Activity

1. Construction, operation or decommissioning of the Project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data.
1.1	Permanent or temporary change in land use, land cover or topography including increase in intensity of land	Yes	The entire land is in possession with JSEB for establishment of Thermal power plant. Approximate total area of 1050 acres

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data.
	use (with respect to local land use plan)		has been identified for setting up the power plant.
1.2	Clearance of existing land, vegetation and buildings?	Yes	There are old abandoned dilapidated staff quarters and few patches of sparse bushes and tree plantation on the proposed site, these will be cleared.
1.3	Creation of new land uses?	Yes	Industrial & residential land use for Power Plant & its related facilities.
1.4	Pre-Construction investigations e.g. bore houses, soil testing?	Yes	Planned to carry out necessary geotechnical investigations including borelogs, soil test etc. in the proposed site.
1.5	Construction works?	Yes	Construction of Power Plant & its ancillary facilities and residential colony.
1.6	Demolition works?	Yes	Demolition of unused/ dilapidated staff quarters present in the project area.
1.7	Temporary sites used for construction or housing of construction works?	Yes	Temporary labour camps would be constructed at site for housing of construction workers.
1.8	Above ground buildings, structures, cut or fill or excavations	No	Construction of Power Plant & its facilities and residential colony on nearly flat land, no cutting and filling required.
1.9	Underground works including mining or tunneling?	No	N.A.
1.10	Reclamation works?	No	N.A.
1.11	Dredging?	No	N.A.
1.12	Offshore Structures?	No	N.A.
1.13	Production and manufacturing processes?	Yes	1320 MW Coal fired Power generation based on Super-Critical technology.
1.14	Facilities for storage of goods or materials?	Yes	Water reservoir, Coal stock yard for storage of coal, storage tanks for HFO and LDO. Closed storage for chemicals, spare parts, equipments, tools, etc.
1.15	Facilities for treatment or disposal of solid waste or liquid effluents?	Yes	For solid waste, it is proposed to dispose/ reuse as per plan stated below. **Ash Disposal System:** Ash utilization will be done as per the MoEF notification of 2009 and 100% fly-ash utilization will be done by the 4th year of plant operation. Fly ash storage silos are proposed for evacuation of ash and same will be transported to end users.

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data.
			The generated ash is to be utilized for commercial purpose for cement plant, ready mix concrete, brick making and aggregate making. It is proposed to use 100% fly ash covering commercial use. Bottom ash will be used for low land filling and road construction. **For liquid wastes:** Recirculation of water in the process whereby the discharge volume is considerably reduced, providing adequate treatment units for removal of suspended or colloidal matter, neutralization of acidic water by lime, use of oil traps and skimming devices for removal of oil & grease from contaminated water. Sewage from various buildings in the power plant area will be treated in Sewage Treatment Plant. Treated effluent water would be used for gardening and non-potable purposes No discharge of effluent outside plant boundary planned.
1.16	Facilities for long term housing of operational workers?	Yes	Township/ Colony will be established.
1.17	New road, rail or sea trafficking during construction or operation?	Yes	Coal will be transported by dedicated plant railway siding having take-off near Patratu station of the existing east-central railway line. The approximate length of proposed railway siding is 5 km. For other transportation the existing road network will be utilized. Some internal road construction and widening for approach roads will happen.
1.18	New road, rail, air, waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc.?	Yes	Same as above
1.19	Closure or diversion of existing transport routes or	No	N.A.

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data.
	infrastructure leading to changes in traffic movements?		
1.20	New or diverted transmission lines or pipelines?	Yes	The power from the power plant switchyard shall be evacuated through 400 kV transmission lines connected to the PGCIL's 400 kV switchyard at Ranchi or Tenughat New pipelines will be routed from Patratu reservoir which is at a distance of about 1.5 km from project site.
1.21	Impoundment, damming, culverting, realignment or other changes to the hydrology of neither watercourses nor aquifers?	No	No Impoundment or damming of any stream is involved. Water would be drawn from existing Patratu Reservoir One small water course is passing through the plant area, this will be suitably re-aligned at some stretches to ensure minimum impact on local hydrology.
1.22	Stream crossings?	Yes	As 1.21 above
1.23	Abstraction or transfers of water from ground or surface water?	Yes	Estimated total consumptive water requirement for the plant is about 37 Million Cubic Meter (MCM) (Approx. 4265 m^3/hr) for 1320 MW, considering re-circulating closed cooling water system with natural draft cooling tower and considering ash water recovery. Drawl of the required quantity of water from nearby Patratu Reservoir.
1.24	Changes in water bodies or the land surface affecting drainage or run off?	Yes	There would be minor re-alignment of some seasonal streams on the site. Utmost care would be taken to manage the run-off. This aspect will be covered during EIA Study.
1.25	Transport of personnel or materials for construction, operation or decommissioning?	Yes	Transport of construction materials from nearby sources to construction work area during construction and transport of coal from mines to the plant site during operation.
1.26	Long-term dismantling or decommissioning or restoration works?	No	Not envisaged

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data.
1.27	Ongoing activity during decommissioning, which could have impact on the environment?	No	Not envisaged
1.28	Influx of people to an area in either temporarily or permanently?	Yes	Since industry attracts both skilled and unskilled labours, influx of population will be there to some extent.
1.29	Introduction of alien species?	No	N.A.
1.30	Loss of native species or genetic diversity?	No	N.A.
1.31	Any other actions?	No	N.A.

2. Use of Natural resources for construction or operation of the Project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply).

S. No.	Information/ Checklist confirmation	Yes/No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
2.1	Land especially undeveloped or agricultural (ha)	Yes	The land required for the proposed project is in possession with JSEB for development of thermal power plant.
2.2	Water (expected source & competing users) unit: KLD	Yes	Water would be drawn from Patratu Reservoir. Approximately 37 Million Cubic Meter (MCM) (Approx. 4265 m3/hr) water will be required for the proposed project considering re-circulating closed cooling water system with induced draft cooling tower and considering ash water recovery.
2.3	Minerals (MT)	Yes	Indigenous Coal: Approximately 6.33 MTPA Indigenous Coal considering design coal GCV of 3600 kCal/kg at 85% PLF
2.4	Construction material- stone, aggregates, and/ soil (expected source- MT)	Yes	Stone, aggregate, soil, sand etc. The construction materials are available locally.
2.5	Forest and Timber (source – MT)	No	N.A.
2.6	Energy including electricity and fuels (source, competing users) Unit: fuel (MT), Energy(MW)	Yes	• Indigenous Coal Approximately 6.33 MTPA Indigenous Coal considering design coal GCV of 3600 kCal/kg at 85% PLF

S. No.	Information/ Checklist confirmation	Yes/No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
			• LDO and HFO
2.7	Any other natural resources (use appropriate standard units)	No	N.A.

3. Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.

S. No.	Information/ Checklist confirmation	Yes / No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data.
3.1	Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the environment (flora, Fauna, and water supplies)?	Yes	• Approximately LDO (3200 KL/y) • Approximately HFO (6600 KL/y) • Approximately Chlorine (40t/y)
3.2	Changes in occurrence of diseases or affect disease vectors (e.g. insect or waterborne diseases)?	No	N.A.
3.3	Affect the welfare of people e.g. by changing living condition?	Yes	The industrial, commercial and residential development is expected to gain in substantial manner which is expected to have positive impact on the living conditions of local population.
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.	No	N.A.
3.5	Any other causes	No	N.A.

4. Production of solid wastes during construction or operation or decommissioning (MT/ month)

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof (with approximate quantities wherever possible) with the source of information.
4.1	Spoil, overburden or mine wastes	No	N.A.
4.2	Municipal waste (domestic and or commercial wastes)	Yes	Solid Waste generated from domestic sources would be disposed off as per Solid Waste (Management & Handling) (SWM) Rules 2000.

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof (with approximate quantities wherever possible) with the source of information.
4.3	Hazardous waste (as per Hazardous Waste Management Rules)	Yes	Hazardous waste producing operations like: • Landscaping and ground maintenance – fuel, • Vehicular/ equipment maintenance – fuel, paints, chemicals, solvents etc • Construction and facility maintenance – lead and other metals, petroleum products etc. All the hazardous waste shall be disposed of as per Hazardous Waste (Management, Handling & Trans boundary Movement) Rules 2008 and amendments.
4.4	Other industrial process wastes	Yes	Ash only- this ash will be handled as per MoEF guidelines.
4.5	Surplus product	No	N.A.
4.6	Sewage sludge or other sludge from effluent treatment	Yes	Treatment Plant Sludge and Sewage Treatment Plant sludge
4.7	Construction or demolition wastes	No	Construction & demolition wastes will be used for filling and leveling of low laying area in the premise itself.
4.8	Redundant machinery or equipment	No	N.A.
4.9	Contaminated soils or other materials	No	N.A.
4.10	Agricultural wastes	No	N.A.
4.11	Other solid wastes	No	N.A.

5. Release of pollutants or any hazardous, toxic or noxious substances to air (kg/m^3):

S. No.	Information/ Checklist confirmation	Yes / No	Details thereof (with approximate quantities wherever possible) with the source of information.
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources	Yes	• Emission of SPM – 270 kg/h per unit(approx) • Emission of NO_2 – 1850 kg/h per unit(approx) • Emission of SO_2 – 3900 kg/h per unit (approx)
5.2	Emission from production Process	Yes	Emission of particulate matter, SO_2, NOx and some fugitive dust are envisaged

S. No.	Information/ Checklist confirmation	Yes / No	Details thereof (with approximate quantities wherever possible) with the source of information.
			from the production process. All necessary measures for emission control like Electrostatic precipitator, bag filters, water spraying etc will be installed.
5.3	Emission from materials handling including storage or transport	No	Not envisaged with usage of bag filters in ash silo, coal transfer point and coal bunkers. Plus there will be no spillage while transporting coal with usage of covered conveyors.
5.4	Emission from construction activities including plant and Equipment	Yes	There will be some emission from construction activities. However, these emissions will last for a very short period and the same will be temporary & restricted within the plant boundary. Also, the dust emission will be eliminated or minimized through water spraying.
5.5	Dust or odours from handling of materials including construction materials, Sewage and waste	Yes	Dust emission will be temporary, for a very short period and restricted within the plant boundary. Water spraying has been envisaged to eliminate/ minimize the dust. Odours will be restricted as per CPCB guidelines.
5.6	Emissions from incineration of waste	No	N.A.
5.7	Emissions from burning of waste in open air (e.g. slash materials, construction debris)	No	N.A.
5.8	Emissions from any other sources	No	N.A.

6. Generation of Noise and Vibration, and emissions of Light and Heat:

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof (with approximate quantities wherever possible) with the source of information.
6.1	From operation of equipment e.g. engines, ventilation plant, crushers	Yes	Noise would be generated generally from steam turbine, generator, compressors, pumps, fans, coal handling plant etc. but all the equipment will be designed and wherever required acoustic materials will be provided to have the noise level not to exceed the values as stipulated in CPCB/ MoEF norms.

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof (with approximate quantities wherever possible) with the source of information.
6.2	From industrial or similar processes	Yes	Noise would be generated from dump transportation of material/ machine.
6.3	From construction or demolition	Yes	Some noise would be generated during construction phase at the site
6.4	From blasting or piling	Yes	Some noise would be generated during piling phase at the site
6.5	From construction or operational traffic	Yes	During construction and coal transportation traffic
6.6	From lighting or cooling systems	Yes	Indirect process cooling, direct water spraying (heat & light emission)
6.7	From any other sources	No	N.A.

7. Risks of contamination of land or water from release of pollutants into the ground or into sewers, surface waters, groundwater, coastal waters or the sea:

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof (with approximate quantities wherever possible) with the source of information.
7.1	From handling, storage, use or spillage of hazardous materials	No	N.A.
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	No	Only treated effluent will be discharged in accordance to the norms specified by CPCB/ MoEF.
7.3	By deposition of pollutants emitted to air into the land or into the water	Yes	• Installing ESP and other air pollution control equipment will minimize the impact on air quality. • COC maximization along with reuse will generate minimum discharge. ESP will be designed to meet stipulated standards. Only treated effluent meeting CPCB norms will be discharged. So there will be no significant impact
7.4	From any other sources	No	N.A.
7.5	Is there a risk of long term build up of pollutants in the environment from these sources?	No	No risk of long term build up of pollutants in the environment is perceived.

8. Risk of accidents during construction or operation of the Project, which could affect human health or the environment:

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with the source of information.
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous substances	Yes	Risk assessment study will be carried out to determine risks associated with storage, handling and transportation of flammables (including LDO, HFO) and toxic materials (chlorine gas) and the necessary mitigation plans will be formulated.
8.2	From any other causes	No	N.A.
8.3	Could the project be affected by natural disaster causing environmental damage (e.g. floods, earthquakes, landslides, cloudburst etc)?	Yes	At the time of construction work, the regulations for the Seismic Zone III will be taken into consideration for designing and setting up the project. The project site is considered safe from floods and landslides.

9. Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality:

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with the source of information.
9.1	Lead to development of supporting utilities, ancillary development or development stimulated by the project which could have impact on the environment e.g.: • Supporting infrastructure (roads, power supply, waste or waste water treatment, etc.) • Housing development • Extractive industries • Supply industries • Other	Yes	This project will lead to development of infrastructures like roads, housing facility, ancillary industries etc in the study area. This will have a cumulative positive impact on the environment in terms of better infrastructure, more organised housing and industrial development and more employment opportunities and better aesthetics of the area.
9.2	Lead to after-use of the site, which could have an impact on the environment	Yes	There will be development of roads, habitations, and other ancillary industries in the study area due to the proposed project, this may have some impact on environment.
9.3	Set up precedent for later	Yes	Later development will be taken into

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with the source of information.
	developments		consideration
9.4	Have cumulative effects due to proximity to other existing or planned projects which similar effects	Yes	There is an existing Thermal Power Plant of JSEB of installed capacity of 840 MW, rerated capacity of 770 MW and currently running at 150-160 MW at about 1.5 km from the project site.

(III) Environmental Sensitivity

S. No.	Areas	Name/ Identity	Aerial distance (within 15 km.) Proposed project location boundary.
1	Areas protected under international conventions, national or local legislation for their ecological landscape, cultural or other related value	No	NA
2	Areas which are important or sensitive for ecological reasons – Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests	Yes	There are no settlements / habitation in the proposed power plant area. However, few protected forests are in the study area
3	Areas used by protected, important or sensitive species of flora and fauna for breeding, nesting, foraging, resting, over wintering, migration	No	N.A
4	Inland, coastal, marine or underground waters	Yes	Patratu Reservoir on Nalkari river is located at about 1.5 km from project site, while Damodar river flows at a distance of approximately 9 km from the proposed project site.
5	State, National boundaries	No	N A
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	No	NA
7	Defense installations	No	Nearest defense Installation Ramgarh Cantonment Area is at a distance of 30km
8	Densely populated or built-up area	Yes	Patratu city at 2.7 km
9	Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)	No	Schools and hospitals are located within 1km distance from the proposed site of the existing power plant campus.

S. No.	Areas	Name/ Identity	Aerial distance (within 15 km.) Proposed project location boundary.
10	Areas containing important, high quality or scarce resources (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	Yes	Protected forest, Patratu reservoir and Damodar river within the study area (10 km distance from the project site)
11	Areas already subjected to pollution or environmental damage. (Those where existing legal environmental standards are exceeded)	No	Ramgarh city which is 30km from the project site falls under CEPI Index and the CEPI value is 65.11.
12	Areas susceptible to natural hazard which cause the project to present environmental problems (earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions)	No	The project is located in Seismic Zone III, and the area is considered safe for floods and landslides.

"I hereby give undertaking that the data and information given in the application and enclosures are true to the best of my knowledge and belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage, the project will be rejected and clearance given, if any to the project will be revoked at our risk and cost.

Date: _____

Place:_____

Signature of the applicant
With Name and Full Address
(Project Proponent / Authorised Signatory)

Proposed Terms of Reference

Project	**2x660 MW Thermal Power Project in Patratu, Ramgarh district of Jharkhand**
Category	A [1(d) Thermal Power Plant ≥ 500 MW]
Project Proponent	Patratu Energy Limited
Location	Village- Patratu District- Ramgarh State- Jharkhand

1.0 INTRODUCTION

M/s Patratu Energy Limited, incorporated under the Companies Act 1956 is setting up a 2x660 MW Coal based Thermal Power Project in Ramgarh District, Jharkhand.

The project is a Category A [S. no. 1(d) Thermal Power Plant ≥ 500 MW] project according to the notification SO 1533 (E) dated 14th September 2006, which requires preparation of EIA Report and environmental clearance from the Ministry of Environment and Forests, Govt. of India.

2.0 EIA METHODOLOGY

The EIA Report will address all the terms of reference and will be prepared in accordance to the Environment Protection Act 1986 and EIA Notification published by Ministry of Environment and Forests, Govt. of India on 14th September 2006. It will form part of the application to the Statutory Authority.

The scope of the EIA Report for the proposed Power Plant includes identifying relevant environmental concerns and focus on potential impacts that may have changed due to the setting up of the plant. The report will also provide an Environment Management Plan and Disaster Management Plan.

3.0 SITE, STUDY AREA & GENERAL ENVIRONMENT

The site is located adjacent to the JSEBs existing Patratu Thermal Power Station in Ramgarh district of Jharkhand State. The site is located about 40 kms from Ranchi. The approximate coordinates of the center of the project area is Latitude Latitude 23°36'49.65- 23°37'20.14"N- and Longitude 85°15'58.34"- 85°16'44.61"-E-. The proposed site does not co inside with any of the declared mineral reserves of the state of Jharkhand. The mineral map of the project with project site superimposed is shown as **Annexure II**

Detailed water availability study is being undertaken by IIT-Roorkee and final location of drawal will be decided on the basis of outcome of the study.

The total area identified for the proposed project is about 1050 acres. The site primarily consists of uncultivated land with sparse bushes and trees.

4.0 PROJECT DESCRIPTION

4.1 PROJECT RATIONALE

The State of Jharkhand was formed on Nov. 15, 2000 by carving out from Bihar. In consequence, Jharkhand State Electricity Board (JSEB) was formed to speed up power reform and to meet growing power demand for development of the newly created state. The load consists mainly of the State industrial units, Mining industry, Steel industry, Railways, Agriculture and others. The State of Jharkhand is blessed with a vast mineral reserves including coal. Its coal reserves accounts for around 32% of the country's total coal reserves. Presently, the State and the country as a whole are reeling under severe power shortage. Thus, the State has the potential of becoming the power hub of the Country.

With its vast coal reserves and other infrastructure facilities, objectives of JSEB is to generate power at minimum possible cost and to supply quality power at the cheapest possible tariff for the sustaining growth of the State and other adjoining States. Most of the existing units of JSEB are very old and already lived their life.

The power project will have significant contribution in the local as well as the national level. The proposed project is in line with existing development plans of the State and Central government and in accordance with the existing or envisioned land use plans. It may be mentioned that the proposed project is according to the priorities of the local government.

4.2 PROJECT LOCATION & SITE ALTERNATIVE

4.2.1 Project Location

The site location for the proposed TPP is near to the existing power stations of JSEB. The Land is in the possession of JSEB. The water requirement will be met from the Patratu reservoir (Nalkari Dam). The coal is likely to be supplied from Banhardih Coal block. The site has excellent connectivity to road and rail links

4.2.2 Site alternatives

The entire land for the proposed project is in possession of JSEB. The site is well connected to rail and road network. Water and coal is available conveniently. Hence, alternate site analysis has not been performed.

JSEB has more than 6,500 acres of land in the area. Details of the site identified for the proposed project has been indicated below:

Description	Site
Availability of land for main plant (Acres)	1050 (Approx.)
Suitability of land for main plant	Suitable
Availability of land for ash pond (Acres)	Around 289 acres (including green belt) of land is identified.
Availability of land for township (Acres)	Around 100 acres of land may be available in and around PTPS township
Availability of land for various corridors	Will be available
Distance from Banhardih coal block	Areal distance is around 100 Km
Accessibility & coal transportation	Accessibility to the site is feasible through the existing railway network
Approach to road	Easy
Approach to railways	Easy
Available water source	Patratu reservoir/ Damodar river
Distance from water source	1.5 km / 9 Km
Availability of water	Likely / unlikely
Grid connectivity	Easy
Environment & forest issues	Less
No. of villages to be displaced	Least
Project Affected Families	Least
Population affected	Less
Type of Structure in affected villages	Mostly temporary

4.3 PROCESS DESCRIPTION

In a Thermal Power Plant, the chemical energy of the fuel (coal) is first converted into thermal energy (during combustion), which is then converted into mechanical energy (through a turbine) and finally into electrical energy (through a generator). Power production from a coal-based plant has the following steps.

Coal would be received from mines through rail in BOBRN/BOXN wagons and unloaded inside the plant. Coal received from BOBRN wagons shall be unloaded into the trackhopper and BOXN wagons shall be unloaded using Rotaside type Wagon Tipplers (WT) into the Wagon Tippler Hopper (WTH). From hoppers the coal will be conveyed via crushers either to the coal stock pile for storage when the coal bunkers are full or directly to the coal bunkers through belt conveyor system.

The coal is transferred by conveyor belt to the coal bunkers, from where it is fed to the pulverizing mills, which grind it to fine powder. The finely powdered coal, mixed with air is then blown into the boiler by a fan where it burns.

The chemical energy in the coal is converted to thermal energy in the steam generator furnace. The steam generator furnace is made up of water wall, where almost half of the heat generated is absorbed. Around 35-40 percent of the heat in the flue gas is absorbed by super heater, re-heater, economizer and air pre-heater and 10%-15% is lost to the atmosphere. The high enthalpy steam is expanded in the

turbine where the thermal energy is converted to kinetic energy. Further, the kinetic energy is converted to electrical energy in the generator, which is then transmitted to user end by transmission system.

During combustion, the non-combustible part of coal is converted into ash. A small part of ash (about 20%) binds together to form lumps, which fall into the ash pits at the bottom of the furnace. This part of ash, known as bottom ash is water quenched, ground and then conveyed for subsequent disposal to ash disposal area.

Major part of the ash (about 80%) is in fine powder form, known as fly ash, and is carried out of the boiler along with the flue gas. The flue gas, after heat recovery, is passed through the electrostatic precipitators, where the ash is trapped by electrodes charged with high voltage electricity.

The flue gases exiting from the Electrostatic Precipitators (ESPs) are discharged through a tall chimney for wider dispersal of remaining ash particles and gases. The ash collected in the ESP hoppers is extracted in dry form and conveyed to dry ash storage silos from where it is supplied to user industries. Unused part of fly ash shall be taken to ash ponds for disposal.

The steam, after passing through the turbines, is condensed back into water in the condensers and the same is re-used as a boiler feed water for making steam.

5.0 BASELINE ENVIRONMENTAL SCENARIO

The baseline data collection will be based upon one season (three month) field environmental monitoring data (excluding monsoon). This includes one season field monitoring metrological data, long term micro-metrology, ambient air quality measurements of PM_{10}, $PM_{2.5,}$ NO_x, SO_2 and CO, water quality, noise measurement, soil quality etc. Primary and Secondary data like ecology, land use pattern, demographic profile data, data on socio-economic secondary sources, Land use pattern of the study area shall be established through field studies available data/ information from secondary sources. The information will be sufficient to support predictions of environmental effects and conclusions about the impacts and consequences of proposed activities.

6.0 ENVIRONMENTAL IMPACT

The impact on environment of the proposed power plant shall be discussed in detail covering gaseous emissions, liquid effluents, particulates, solid wastes, noise, etc. With knowledge of the baseline condition and plant characteristics, positive and negative impacts during the construction and operation phase will be identified and assessed. Impact of the stack emissions on terrestrial flora will be scientifically documented based upon species composition of the area and their air pollution tolerance levels. The impact will be expressed through appropriate matrix. Special reference will be made with respect to following impacts.

6.1 AIR QUALITY IMPACT

A computer based internationally recognized mathematical air quality model e.g., ISCST3) will be identified and run to predict the concentration of SPM, SO_2 & NOx due to the operation of the power plant. The model will take into account other sources of pollution and topographical features of the study area. The emission of relevant pollutant (SPM, SO_2 and NOx) from nearby sources shall be used in the model for more accurate estimate of air quality. The results will be presented for short term (24 hourly) concentrations over a radius of 10 km. around the plant. The dispersion model results will be included in the report using isopleths or other graphical methods, over laying a map of the surrounding area. The predicted air quality shall be compared with existing regulations and ameolioratory measures, if any required will be identified. The impact at all the monitoring locations shall also be estimated.

6.2 WATER QUALITY IMPACT

The impact of liquid effluents on natural water bodies receiving the effluents shall be established and significant parameters, which are likely to change critically, shall be clearly spelt out. Identify Project activities, including construction, which may affect surface water or ground water.

- Describe how water will be discharged to the river or any other water body.
- Describe the potential effects on the river and groundwater where applicable.
- Describe mitigation measures to minimize potential effects including potential thermal discharge of the Project on the surface water source and groundwater during the construction and operation, phases of the Project on-and off-site.
- Describe proposed water management programs.
- Describe anticipated water use minimization, water recycling, water conservation efforts and wastewater handling for this project.
- Describe the quantity and source of wastewater. Review industrial wastewater treatment technology and describe the wastewater treatment system. Consider techniques, e.g., pollution prevention and in-plant controls, to establish the lowest practical discharge levels (in terms of loads and concentrations) of the new plant.
- Provide a summary of discharge parameters, water quality effects and possibilities for reduction based on technology.
- Identify any activities that may potentially affect fish habitat and fish resources.

6.3 PREDICTION OF NOISE LEVELS

Sources of noise and its impacts on the environment shall be clearly brought out. The noise levels at varying distances from source will be predicted using suitable model. Discuss the effect on noise levels at local residences during the construction and operational phases of the Project. A comparison of measured noise (Leq) at monitoring locations to that of predicted noise levels (Leq) should be made and mitigative measures required, if any, will be recommended to conform to the

regulatory ambient air noise standards and identify noise reduction measures and traffic management strategies.

6.4 SOLID WASTE MANAGEMENT

Non-hazardous and hazardous solid waste generation points during construction and operation phase will be identified. Non-hazardous waste during construction phase will be construction waste, debris etc and Hazardous waste during operation phase will be waste resulting from painting, blasting, cargo handling operation etc. Subsequently impact of the same will be quantified and accordingly proper mitigation measure to minimize solid waste generation and environmental compactable disposal/ recycling of waste to conserve natural resources will be suggested.

6.5 SOCIAL IMPACTS

Social impacts will be identified and necessary amelioratory measures, if any enquired will be prescribed. The beneficial impacts of the project on the local community shall also be delineated. Some impacts are associated with the health, sanitation, security and housing needs of the workforce. In particular, the proponent will identity socio-cultural impacts of large number of workers employed during the construction phase on local communities. Provide information regarding the effects of the Project on the Study Area, on the region, including:

- local employment and training;
- local procurement;
- population changes ;
- demands upon local services and infrastructure such as social services and law enforcement ; and
- economic benefits

6.5.1 Corporate Social Responsibility (CSR)

The CSR activity in the surrounding areas of the project would be taken up in line with MoEF guidelines. Project proponent would identify the CSR requirements through NGOs and also during the Public Hearing for the project.

A time bound CSR implementation plan with allocation of cost would be taken up by the project proponents.

7.0 DISASTER MANAGEMENT PLAN AND OCCUPATIONAL SAFETY

A Disaster Management Plan (DMP) for dealing with emergency situations arising due to fire, explosion, leakages of hazardous substances, etc. in the plant shall be prepared. The plan will also include storage, handling, transportation etc. for the hazardous and toxic materials to be used in the power station. Occupational risk involved during construction and operation of the plant should be assessed and necessary safety and protective measures should be spelt out.

8.0 GREEN BELT DEVELOPMENT PLAN

A green belt development plan for the project site should be included in the EIA report as per MOEF guidelines. Details such as areas to be planted, suitable plant species, plantation technique and necessary infrastructures required for plantation etc. shall be clearly mentioned. The plan shall include the minimum width, tree density. Other aspects like rain water harvesting by designing suitable recharge pits shall be included.

9.0 POST-STUDY MONITORING PLAN

It is necessary to monitor certain environmental parameters identified as critical or as required by regulatory agencies. Considering the requirements of Regulatory Agencies and identified critical parameters, a post study environmental monitoring programmed will be designed. All equipment and manpower requirement necessary for the implementation of this programmed and cost involved will also be identified.

10.0 ENVIRONMENTAL MANAGEMENT PLAN

At this stage, it may become apparent that additional environmental management and pollution control measures will be necessary to meet the requirements of the regulatory agencies. In respect of impacts identified, which need to be controlled, an environmental management program in accordance with the principles should be considered. Where practicable costs of monitoring programs should be estimated and a budget for implementation shall be presented. Recommendations on mitigation measures, as and where such measures are warranted shall be delineated. Environmental Management Plans will be developed to selectively mitigate the adverse impacts of the power project activities. Recommendations shall be made concerning establishment of Environment Management Group and training of staff, wherever necessary.

Environmental Management Plan shall include the following points:

- Summary of potential impacts & recommended mitigation measures
- Allocation of resources and responsibilities for plan implementation
- Administrative and technical setup for management of environment
- Institutional arrangements proposed with other organizations/ Govt. authorities for effective implementation of environmental measures proposed in the EIA
- Safe guard/ mechanism to continue the assumptions/ field conditions made in the EIA environmental specifications for contractors should cover the required safeguards during the design and construction stage

11.0 COMPOSITION OF EIA REPORT

After going through above studies, EIA report, for submission to Ministry of Environment and Forest (MoEF), shall be prepared having following chapters:

- Chapter I – Introduction
- Chapter II – Project Description
- Chapter III – Description of the Environment
- Chapter IV – Anticipated Environmental Impacts and Mitigation Measures
- Chapter V – Analysis of Alternatives
- Chapter VI – Environmental Monitoring Program
- Chapter VII – Additional Studies
- Chapter VIII – Project Benefits
- Chapter IX – Environmental Management Plan
- Chapter X – Summary and Conclusion (Summary EIA)
- Chapter XI – Disclosure of consultants engaged development

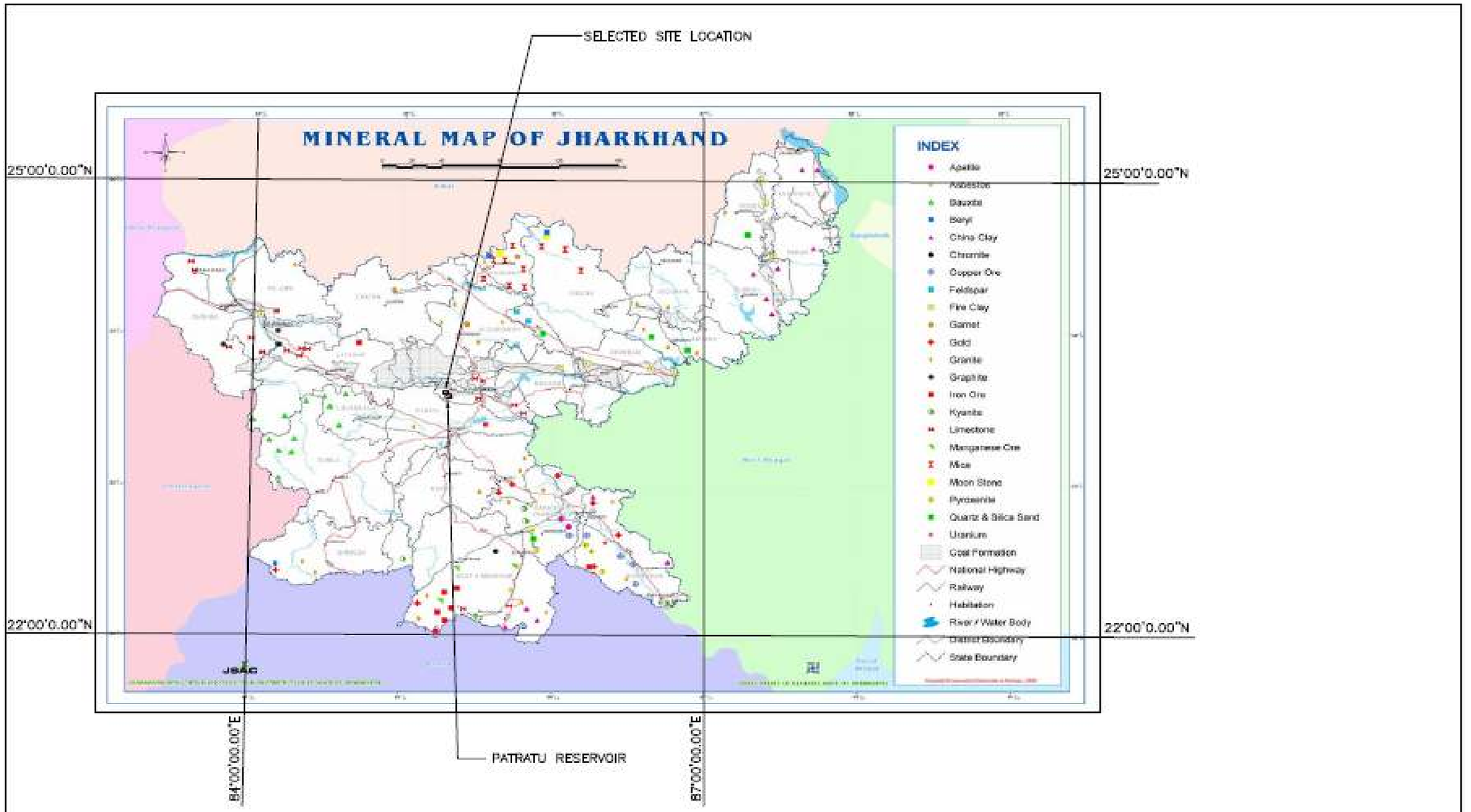
ANNEXURE I

LOCATION PLAN

DO NOT SCALE

EXHIBIT-01

TATA CONSULTING ENGINEERS LIMITED



PROPOSED SITE LOCATION ON MINERAL MAP

PRELIMINARY

DO NOT SCALE | EXHIBIT–06

FOR RD ISSUE ONLY			ISSUE	REVISIONS	DRN	CLEARED					APPD	DATE
CLEARED						CHEM	CIVIL	ELEC	I&C	MECH		
DEPT	SIGNATURE	DATE										
CHEM												
CIVIL												
ELEC												
I&C												
MECH												

FILE NAME: P04994.DWG

FILE NAME: 6921A–005

TATA CONSULTING ENGINEERS LIMITED
MUMBAI

CLIENT : PFC CONSULTING ENGINEERS

PROJECT : 2 X 660 MW SUPER CRITICAL TPP AT PATRATU

PROPOSED SITE LOCATION ON MINERAL MAP

SCALE: NONE	APPROVED	DATE (RD ISSUE)
OFFICE–INITIALS–ME		DATE (CURRENT ISSUE) 28–09–2012
DRN: NTK		
CHD:	DRG NO: TCE.6921A–ME–SK–005	ISSUE: P3

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