Chapter-I

INTRODUCTION

1.1 Purpose of the report

Baragolai OCP block of Makum coalfield stretches over a strike length of 9.0 Km. Western part of the block is being exploited by Tikak OCP and eastern part of the block, which is separated by Ledopani nala from rest of the block, is being exploited by Tirap OCP. The central portion of the block, which is in continuation of Tikak OCP and stretched upto Ledopani nala, is proposed to exploit by opencast mine and named as Tikak Extension OCP. The Tikak Extension Opencast Project stretches over a strike length of 2.0 km out of 9.0 km strike length of the Baragolai OCP block. The Baragolai OCP block occurs in the Makum coalfield of Tinsukia district of Assam, which is the largest and the most important coalfield among the coalfields of North Eastern India. This coalfield contributes for more than 90% coal production of NEC. The coal deposits occur in difficult terrain generally forest clad and in high rainfall areas. Though the reserves of Makum coalfield are small (nearly 260 Mt), yet the coal deposits are gained added importance by virtue of their location away from major coal deposits and characteristics. The coal is characterised by low ash percentage, high contents of volatile matter, sulphur, maceral and show caking propensity. The coal can be blended with coking coal to use as metallurgical coke.

In the year 1974, a feasibility report namely Baragolai Hill-Top Opencast project was prepared but never started. Later on, a Revised Feasibility Report was prepared in 1978 for a rated capacity of 0.20 Mty at an estimated capital investment of Rs. 440.54 lakh but in the process of sanction the production capacity was enhanced to 0.25 Mty with an estimated capital investment of Rs. 399.56 lakh. The report was sanctioned in the year 1978 but did not take off. In the year 1983, a Revised Cost Estimates was worked out and requirement of capital investment was estimated at Rs. 702.39 lakh without

D.R.E. Mineable reserves of 5.00 Mt had been identified at an average stripping ratio of 4.80 cum/t. This RFR was based on the "Geological Note on Quarriable Coal in Baragolai Hill-Top" in Makum Coalfield, Assam, prepared by exploration cell of NEC in the month of February' 1978. The Geological Note was based on data from 10 nos. of trenches but not a single borehole. The planed project had never started in this block.

CMPDI prepared a Report on coal exploration in Baragolai OCP block, in August'1987 with the data of 29 nos. of boreholes and 15 nos. of trenches. The proposed Tikak Extension opencast project is prepared, based on this new geological report.

The Tirap and Tikak opencast mines are at present the only coal producing opencast mines in NEC. The projectised balance mineable reserves at Tirap OC mine would last for another 3-4 years at the current rate of production. Thus the Tirap OC mine is nearing its closure.

Tikak OC mine would be the only OC mine producing coal at the rate of 1.20-1.25 lakh tonne per annum for another 12-15 years.

By closing one OC mine producing coal at the rate of 3.40-3.50 lakh tonne per annum would bring down NEC further into red. The demand of coal as well as overall economics of the northeastern coalfields has therefore necessitated for looking at alternatives. Thus, the alternative lies in increasing opencast production in current economic situation.

The proposed project will be able to compensate partly for the loss of production due to closure of Tirap opencast mine.

1.2 Identification of Project & Project Proponant

Tikak Opencast project is one of the new coal project of the Makum Coalfields in the Tinsukia District of Assam of North Eastern Coalfields (NEC). NEC is proponent of the mine and it is under administrative control of Coal India Limited. Coal India Limited Is a Public sector Undertaking of central government India and functioning under the Ministry of Coal, Govt. of India.

1.3 Brief Description of nature, size, location of the project and its importance to the Country.

The proposed Tikak Extension OCP is located in the north-central region of Makum coalfield, Dist : Tinsukia, Assam.

1.3.1 Location of mine (s)

P.O. Margherita, Sub-Division:- Margherita., District :- Tinsukia(Assam)

1.3.2 Status of Project : The proposal relates to a New Mine in virgin seams

1.3.3 Site Information (Ref: Plate-I & II)

1.3.4 Geographical Location

- **Latitude** : 27°15' to 27°25'
- **Longitude** : 95°40' to 95°5'
- **Survey of India Topo sheet number** : 83M/11,83M/15 and 92A/3
- **Elevation above Mean Sea Level** : 150m -155 m
- **Total mining lease area (in ha.)** : 192 Ha

1.3.5 Dominant nature of terrain :

The project is situated along the northern flank of the Naga-Patkai range and is characterised by rugged hilly terrain with elevations ranging from lower heights of 225 m RL at the eastern side to 425 m RL in south western side. The NH – 38 passes through flat to gently rolling terrain, having elevation of 150 m to 155 m above MSL. Terrain starts rising steeply from south side of NH –38 and attends an elevation of 365 m to 425 m within a distance of 1.5 km at the middle portion of the project and after that the hill starts to decline. In general the ground slope is towards north but it is towards south from mid sector of the project.

1.3.6 Communication:

The block lies about 8 Km southeast of Margherita town, headquarter of the NEC. The nearest railway station is Ledo, which is located at a distance of nearly 3 km on the Dibrugharh-Tinsukia-Lekhapani section of NF Railway. The National Highway -38 running east west passes about 1 km north of the

project and connects the area with the rest of the country. Tinsukia, the district headquarter is situated about 50 km west of the project. Nearest airport Mahanbari (Dibrugharh) is at a distance of nearly 90 km from the project. The block can be approached from Margherita by NH-38 and then through the approach road of Tikak OCP and lastly rugged terrain by kutcha hilly track or temporary roads.

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1.3.7 Seismic zone in which ML area falls:

The ML falls in Zone-V. No earthquake has been reported in last 10 years.

1.3.8 IMPORTANCE

1.3.8.1 Coal demand & availability

Annual coal production from NEC underground as well as opencast mines and future projection of coal production is also presented in Table. 1.3.1. The Table 1.3.1 establishes that there will be gap between the availability of coal from NEC and the demand which necessitates the augmentation of coal and thus requiring opening of new coal mines in the region. This project is a step to bridge the gap between the demand and availability.

Table 1.3.1 Year-wise Actual Coal production vis-à-vis scheduled from NEC

Year	Opencast mine Lakh ton(Lt)	Underground mine (Lt)	Total (Lt)
1996-97	4.7	2.8	7.5
1997-98	4.9	2.0	6.9
1998-99	4.6	1.8	6.4
1999-00	3.7	2.0	5.7
2000-01	4.6	2.0	6.6
2001-02	4.8	1.7	6.5
2002-03	5.2	1.1	6.3
2006-07	7.8	1.8	9.6
2009-10	11.5	2.0	13.5

1.3.8.2 Benefits at national level

North Eastern Coalfields is facing increasing demand of coal. The coals are relatively of better quality, being characterised by low ash, (5-10%), high moisture (2–5%) but high volatile (40-48%) and high sulphur content (2-7%). The coals also exhibit strongly caking properties The coals are also suitable for coal liquefaction. Therefore, these coals have greater market potential than what is exploited at present.

Continuing and augmentation of coal production from the mines of NEC will help to bridge the gap of demand and supply. To meet the growing demand of NEC has planned to increase its production capacity.

1.3.8.3 Benefits at Project level

Ever increasing demand of coal from NEC makes it suitable choice for opening of new project. The Tirap and Tikak opencast mines are at present the only coal producing opencast mines in NEC. The projectised balance mineable reserves at Tirap OC mine would last for another 3-4 years at the current rate of production. Thus the Tirap OC mine is nearing its closure.

Tikak OC mine would be the only OC mine producing coal at the rate of 1.20-1.25 lakh tonne per annum for another 12-15 years.

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The proposed project will be able to compensate partly for the loss of production due to closure of Tirap opencast mine.

1.3.8.4 Benefits at local level

The proposed expansion will also bring enhanced socio-economic benefits to the local population of the project area by way of direct and indirect employment, improvement in infrastructure and growth of ancillary facilities

1.4 SCOPE OF THE STUDY – DETAILS OF REGULATORY SCOPING CARRIED OUT

Scope of the study – details of regulatory scoping carried out and communicated vide letter no. J-11015/231/2007-IA.II(M) dated 23.05.07 by MoEF. (As per Terms of Reference discussed on 09.05.07 at MoEF, New Delhi)

COMPLIANCE OF TERMS OF REFERENCE

Sl. No.	Particulars	Reply with Reference
i	The EIA-EMP report should cover the impacts and management plan for the project specific activities on the environment of the region, and the environmental quality - air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modeling for a rated capacity of 0.20 MTPA of coal/lignite production, which is capacity for which the Project is approved by MOC/Company . Baseline data collection can be for any season except monsoon.	Chapter-III & Chapter-IV
ii	A Study area map of the core zone and 10 km area of the buffer in addition to delineating the major topographical features such as the land use, drainage, locations of habitats, major construction including railways, roads, pipelines, major industries/mines and other polluting sources, which shall also indicate the migratory corridors of fauna, if any and the areas where endangered fauna and plants of medicinal and economic importance are found in the area.	Plate- XVII
iii	Map showing the core zone delineating the agricultural land (irrigated and irrigated uncultivable land (as defined in the revenue records), forest areas (as per records) and grazing land and wasteland.	Plate- VI
iv	Contour map along with Site plan of the mine showing the various proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, CHP, ETP, Stockyard, township/colony (Within/adjacent to the ML), undisturbed area and if any natural topography such as existing roads, drains/natural water bodies are to be left undisturbed along with any natural drainage adjoining the lease and modification of thereof in terms of construction of embankment/bunds, proposed diversion/rechannelling of the water courses, etc., highways, passing through the lease.	Plate-I & Plate-II
v	Break up of lease area as per different land uses and their stage of acquisition. Revenue records/letter from the District Revenue Office may be furnished in regard to land records/usage.	Chapter-II

Sl. No.	Particulars	Reply with Reference
vi	Impacts of project, if any, in the land use in particular, agricultural land / forestland /grazing land/water bodies falling within the lease and acquired for mining operations.	Chapter-IV
vii	Study on the existing flora and fauna in the study area carried out by an institution of relevant discipline and the list of flora and fauna duly authenticated separately for the core and buffer zone and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna. If the project is an existing one, the flora and fauna details should be furnished separately for the core zone and buffer zone. The report and the list should be authenticated by the concerned institution carrying out the study and the names of the species along with the classification under the Wild Life Protection Act should be furnished.	Chapter-III
viii	Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working plan/ scheme until end of mine life should be reflected on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps should also be included.	Chapter-II, Plate- III, IV,V
ix	Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing river/ water courses flowing though the ML and adjoining the lease and the Impact on the existing users and impacts of mining operations thereon.	Chapter-IV
x	Collection of one-season (non-monsoon) primary base-line data on environmental quality air (SPM, RPM, SOx and NOx),. noise, water (surface and groundwater), soil.	Chapter-III
xi	Map of the study area (core and buffer zone) clearly delineating the location of various monitoring stations (air/water/soil and noise - each shown separately) superimposed with location of habitats, wind roses, other industries/ mines, polluting sources. The number and location of the stations should be selected on the basis of the proposed impacts in the downwind/ downstream/ ground water regime. One station should be in the upwind/upstream/non-impact non-polluting area as a control station. Wind roses to determine air pollutant dispersion will be drawn and Prediction Modeling of AAQ will be carried out. Monitoring should be as per CPCB guidelines. Parameters for water testing for both ground and surface as per ISI standards.	Plate-XIV, XV, XVI, XVII, XVIII, XIX, XX
xii	Impact of mining and water abstraction use in mine on the hydrogeology and groundwater regime within the core zone	Chapter-IV

Sl. No.	Particulars	Reply with Reference
	and 10 km buffer zone including long-term modeling studies on the impact of mining on the groundwater regime. Details of rainwater harvesting and measures for recharge of groundwater should be reflected.	
xiii	Detailed water balance should be provided. The break up of water requirement as per different activities in the mining operations should be given separately. Source of water for use in mine, sanction of the competent authority in the State Govt. and impacts vis-à-vis the competing users.	Chapter-III
xiv	Impact of choice of selected use of HEMM machinery - and impact on air quality/OB dumping, mineral transportation, adoption of wet drilling, etc, Impact of blasting, noise and vibrations.	Chapter-IV
xv	Impact of mining using the AAQ predictive modeling for options – BAU and AAQ after introduction of mitigative measures.	Chapter-IV
xvi	Impact of mineral transportation - within and outside the lease. The entire sequence of mineral production. transportation. handling, transfer and storage of mineral and waste, and their impacts on air quality should be shown in a flow chart with the specific points where fugitive emissions can arise and the specific pollution control/ mitigative measures proposed to be put in place. Examine the adequacy of roads existing in the area and if new roads are proposed, the impact of their construction and use particularly if forest land is used.	Chapter-IV
xvii	Details of various facilities to be provided in terms of parking, rest areas, canteen, and effluents/pollution load from these activities. Examine whether existing roads are adequate to take care of the additional load of mineral and OB transportation, their impacts.	Chapter-VII
xviii	Examine the number and efficiency of mobile/ static water sprinkling system along the main haul roads, approach roods, and also the frequency of their use in impacting air quality.	1 no of water sprinkler provided
xix	Impacts of CHP on air and water quality. A flow chart of water use and whether the unit can be made a zero-discharge unit.	There is no CHP
xx	Progressive Mine Closure Plan and Greenbelt Development, Plan: Details of waste generation - OB and topsoil- as per the approved calendar programme in the approved Mining Plan/Project for the rated capacity, and their management shown in maps as well in the explanatory chapter with tables giving progressive mine development and mine closure plan, green belt development with species selected based on their suittability , Backfilling programme	Chapter-IV, Plate-XI,XII,XII,XXI

Sl. No.	Particulars	Reply with Reference
	and conceptual post mining land use. OB dump heights and terracing should be based on slope stability studies with a max of 28° angle as the ultimate slope. Section of dumps (ultimate) (both longitudinal and cross section) with relation to the adjacent area should be shown. The proposed height of 120m appears to be high , especially given the high rainfall in the area and the hilly terrain and the resultant possibility of soil erosion. A slope stability study for the OB dumps in view of the high rainfall and poor stability of the terrain , requires to be carried out with and without the use of geotextile, particularly in critical patches. The feasibility of dumping the OB in near by abandoned mines should also be explored.	
xxi	Conceptual mine closure plan along with the fund requirement for the detailed activities proposed there under. Impacts of change in land use of agricultural land for mining operations and whether the land can be restored for agricultural use post mining. Also to examine if at the end of mine life, the depth of excavated void, if any, being left as water reservoir can be reduced and can be gently sloped to reduce risk to end users . Impact of excavated area , if any, being left as a void including Disaster Prevention and Management Plan.	
xxii	Occupational health issues- Baseline data on the health of the population and measures for occupational health and safety of the personnel and manpower for the mine.	Chapter-III
xxiii	Including cost of EMP (capital and recurring) in the project cost and for progressive and final mine closure plan The specific costs (capital and recurring)of each pollution control/mitigative measures proposed in the project until end of mine life and a statement that the this is included in the project cost	Chapter-IX
xxiv	Integrating in the Environment Management Plan, measures for minimizing use of natural resources water, land, energy, raw material/ mineral etc.	
xxv	Detailed R&R Plan, with data on the existing socio-economic status of the population in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc and the schedule of the implementation of the R&R Plan and status of implementation.	R&R policy as per CIL rules.
xxvi	Public Hearing should cover the details of notices issued in the newspaper, proceedings/minutes of public hearing, the points raised by the general public and commitments made	Not yet done

Sl. No.	Particulars	Reply with Reference
	in a tabular form. If the Public Hearing is in the regional-language, an authenticated English Translation of the same should be provided.	
xxvii	Status of any litigation/ court cases filed/pending on the project.	

All documents should be properly indexed, page numbered.	Yes
Period/ date of data collection should be clearly indicated.	Yes
Authenticated English translation of an material provided in Regional languages.	NA
After the preparation of the draft EIA-EMP Report as per the aforesaid TOR, the proponent shall get the Public Hearing conducted as prescribed in the EIA Notification 2006 and take necessary action for obtaining environmental clearance under the provisions of the EIA Notification 2006.	NA
The copy of the letter received from the Ministry on the TOR prescribed for the project should be attached as an annexure to !he final EIA-EMP Report.	Yes
The final EIA-EMP report submitted to the Ministry must incorporate the issues in TOR and that, raised in Public Hearing. The index of the final EIA-EMP report, must indicate the specific chapter and page no. of the EIA-EMP Report where the specific TOR prescribed by Ministry and the issue raised in the P.H. have been incorporated	NA