

No. J-11015/272/2008-IA.II(M)  
Government of India  
Ministry of Environment & Forests

Paryavaran Bhawan,  
CGO Complex,  
New Delhi-110510.

To

Dated: 25<sup>th</sup> August 2008

Shri Sanjay Kumar Jain,  
Associate Vice-President (Coal),  
**M/s Bharat Aluminium Company Ltd.,**  
COSMOS Building, Power Plant-II Premises,  
BALCO Nagar, KORBA,  
CHHATTISGARH – 495684.

**Sub: Durgapur II – Tariamr Coal Block (4 MTPA) and linked Coal Washery (4 MTPA) of M/s BALCO located in Tehsil Dharmjaigarh, District Raigarh Chhattisgarh - Terms of Reference (TOR) – reg.**

Sir,

The undersigned is directed to refer to your letter no. BALCO/Coal Mine/2008 dated 20.06.2008 regarding the above-mentioned subject which was considered in the Expert Appraisal Committee (Thermal & Coal Mining) held on 28<sup>th</sup> –30<sup>th</sup> July 2008. It was noted that the proposal is for opening a new OC-cum-UG coalmine block of 4 MTPA capacity over a total project area of 1070 ha, along with a coal washery of 4 MTPA capacity in district Raigarh, Chhattisgarh.

It was informed that the proposal is to meet the coal requirement of a 300 MW TPP-Smelter integrated project located at a distance of 78km. The entire area is mineralised. Of the total project area, 365.056 ha is forestland. There are no ecologically sensitive areas such as WL sanctuaries, National Parks places of archaeological importance, etc. within the 15km buffer zone. It was clarified that the forest within the block is village forest and not RF. Coal quality varies from grade c to G. Seams V and VA would be mined by OC and Seams IV, III and II would be mined by UG mining. The life of OC operation is 25 years and UG is 75 years. UG mining would be by using continuous miner. If seam thickness exceed 5m then blasting would be undertaken. River Mand flows outside the block alongside the lease boundary for which a safety barrier of 60m would be left. It is proposed to construct an embankment 3m higher than HFL. SH-4 (Dharamjaygarh to Kharsia) passes along the SE corner of the lease for a distance of 1.70km. R&R involves 3 revenue villages comprising 172 PAFs. It was clarified that ext. OB dumping would be only for a period of 3 years and the OB would be rehandled along with concurrent backfilling. Coal (12,000 TPD) would be transported by road involving 400 trucks per day along the SH-4. It was informed that the coal washery to be established with the project would be by wet process. Coal waste rejects would be used in a 30 MW FBC based TPP.

The Committee noted that the parting between OC and UG is about 20m which is less and if there is blasting, it can lead to collapse of workings and also mine inundation from water collected in the mine pit. The Committee observed that a 2<sup>nd</sup>/3<sup>rd</sup> order stream passes through the lease. The Committee desired that a detailed Area Drainage Study, which includes impacts on hydrology, and whether an embankment all along River Mand is required, should form a part of the study. The Committee desired that there should be minimal disturbance to the stream and to River Mand due to mining. The quality of water at the point of joining the River Mand, which is

also to be monitored u/s and d/s of the proposed mine. The Committee stated that no OB should be used for embankment. The Committee desired that mineral transportation for a distance of 70km by road by 400 trucks would cause a lot of air pollution problem and disturb the local communities. The Committee desired that the proponent should explore constructing/extending an existing railway track or use of belt conveyor for transport of the washed coal and coal rejects to FBC based TPP. The details of this plan should be presented as part of the EIA-EMP Report. On R&R, the Committee desired for a detailed project specific R&R to be formulated giving details of tribals, BPL, SC/ST etc. and a plan for resettlement including employment. The Committee desired that the proponent should carry out a pre-mining survey on the socio-economic status based on the major indices/parameters given in the UNDP Human Development Report, which should be monitored over the project life.

The Committee based on the application made, documents furnished and presentation thereon recommended the TOR for the Coalmine-cum-coal washery unit as given below:

- (i) An integrated EIA-EMP Report would be prepared for **4 MTPA** rated capacity coal mine and **4 MTPA** capacity coal washery based on the generic structure specified in Appendix III of the EIA Notification 2006.
- (ii) The EIA-EMP Report would 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 modelling for **4 MTPA** of coal production based on approval of project/Mining Plan for 4 MTPA coalmine-cum-coal washery. Baseline data collection can be for any season except monsoon.
- (iii) A map specifying locations of the State, District and Project location.
- (iv) A Study area map of the core zone and 10km area of the buffer clearly delineating the major topographical features such as the land use, surface drainage of rivers/streams/nalas/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries/mines and other polluting sources. In case of ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found in the 15 km area of the buffer zone should be given.
- (v) Land use map (1: 50,000 or 100,000 scale) based on a recent satellite imagery of the study area may also be provided with explanatory note of the land use.
- (vi) Map showing the core zone delineating the agricultural land (irrigated and non-irrigated, uncultivable land (as defined in the revenue records), forest areas (as per records).
- (i) Contour map of 3m intervals showing the area drainage of the core zone along with 2km of the buffer zone.
- (ii) 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 and adjacent to the ML), undisturbed area and if any, in topography such as existing roads, drains/natural water bodies are to be left undisturbed along with any natural drainage adjoining the lease /project and modification of thereof in terms of construction of embankments/bunds, proposed diversion/rechannelling of the water courses, etc., approach roads, major haul roads, etc.
- (ix) Break up of lease/project area as per different land uses and their stage of acquisition.  
Break-up of lease/project area as per mining operations.  
Impact of changes in the land use due to the start of the projects if much of the land being acquired is agricultural land/forestland/grazing land.
- (xii) Collection of one-season (non-monsoon) primary baseline data on environmental quality - air (SPM, RSPM, SO<sub>x</sub> and NO<sub>x</sub>), noise, water (surface and groundwater), soil.

- (xiii) Map of the study area (core and buffer zone clearly delineating the location of various stations superimposed with location of habitats, other industries/mines, polluting sources. The number and location of the stations in both core zone and buffer zone should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable.
- (xiv) Study on the existing flora and fauna in the study area (10km) 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 study area has endangered flora and fauna, or if the project falls within 15 km of an ecologically sensitive area, then a comprehensive Conservation Plan should be prepared and furnished along with comments from the CWLW of the State Govt.
- (xv) Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working 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 and sections should be included.
- (xvi) Details of mining methods, technology, equipment to be used, etc., rationale for selection of that technology and equipment proposed to be used vis-à-vis the potential impacts.
- (xvii) The Committee noted that the parting between OC and UG is about 20m which is less and if there is blasting, it can lead to collapse of workings and also mine inundation from water collected in the mine pit. The Committee observed that a 2<sup>nd</sup>/3<sup>rd</sup> order stream passes through the lease. The Committee desired that a detailed Area Drainage Study, which includes impacts on hydrology, and whether an embankment all along River Mand is required, should form a part of the study. Impact of mining on hydrology, modification of natural drainage, diversion and channelling of the existing rivers/water courses flowing through the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon. The Committee desired that there should be minimal disturbance to the stream and to River Mand due to mining. The quality of water at the point of joining the River Mand, which is also to be monitored u/s and d/s of the proposed mine.
- (xviii) Detailed water balance should be provided. The break up of water requirement for the various mine operations should be given separately.
- (xix) Source of water for mine operations, sanction of the competent authority in the State Govt. and impacts vis-à-vis the competing users.
- (xx) Impact of mining and water abstraction use in mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term modelling studies on. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/or if the area falls within dark/grey zone.
- Impact of blasting, noise and vibrations.
- (xxii) Impacts of mining on the AAQ, predictive modelling using the ISCST-3 (Revised) or latest model.
- (xxiii) The Committee desired that mineral transportation for a distance of 70km by road by 400 trucks would cause a lot of air pollution problem and disturb the local communities. The Committee desired that the proponent should explore constructing/extending an existing railway track or use of belt conveyor for transport of the washed coal and coal rejects to FBC based TPP. The details of this plan should be presented as part of the EIA-EMP Report. Impacts of mineral transportation – within and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions. Impacts of transportation, handling, transfer of mineral and waste on air quality, generation of effluents from workshop, management plan for maintenance of HEMM, machinery, and equipment. Details of various facilities to be provided in terms of parking, rest areas, canteen, and effluents/pollution load from these activities.
- (xxiv) Details of waste generation – OB, topsoil – as per the approved calendar programme, and their management shown in figures as well explanatory chapter with tables giving progressive development and

mine closure plan, green belt development, backfilling programme 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. Sections of dumps (ultimate) (both longitudinal and cross section) with relation to the adjacent area should be shown.

(xxv) Impact and management of wastes and issues of rehandling and backfilling and progressive mine closure and reclamation.

(xxvi) Flow chart of water balance. Treatment of effluents from workshop, township, domestic wastewater, mine water discharge, etc. Details of STP in colony and ETP in mine. Recycling of water to the max. possible extent.

(xxvii) Occupational health issues. Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine.

(xxviii) Disaster Management Plan.

(xxix) Integrating in the Env. Management Plan with measures for minimising use of natural resources - water, land, energy, etc.

(xxx) Progressive Green belt and afforestation plan (both in text, figures as well as in tables prepared by MOEF) and selection of species (local) for the afforestation/plantation programme based on original survey/landuse.

(xxiii) Conservation Plan for the endangered/endemic flora and fauna found in the study area and for safety of animals visiting/residing in the study area and also those using the study area as a migratory corridor.

(xxxii) Final Mine closure issues, post mining land use and restoration of land/habitat to pre-mining.

(xxxiii) Including cost of EMP (capital and recurring) in the project cost and for progressive and final mine closure plan.

(xxxiv) Details of R&R. Detailed project specific R&R Plan with data on the existing socio-economic status of the population (including tribals, SC/ST, BPL families) found 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 costs along with the schedule of the implementation of the R&R Plan. The Committee desired that the proponent should carry out a pre-mining survey on the socio-economic status based on the major indices/parameters given in the UNDP Human Development Report, which should be monitored over the project life.

(xxxv) 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 by the proponent should be presented in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.

(xxxvi) In built mechanism of self-monitoring of compliance of environmental regulations.

(xxxvii) Status of any litigations/ court cases filed/pending on the project.

## **TOR FOR COAL WASHERY**

Based on the presentation made and discussions held, the Committee prescribed the following TOR:

(i) A brief description of the plant, the technology used, the source of coal, the mode of transport of incoming unwashed coal and the outgoing washed coal. Specific pollution control and mitigative measures for the entire process.

(ii) The EIA-EMP report should cover the impacts and management plan for the project of the capacity for EC is sought and the impacts of 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 for the rated capacity. If the washery is captive to a coal mine/TPP/Plant the cumulative impacts on the environment and usage of water should be brought out along with the EMP.

(iii) A Study area map of the core zone and 10km area of the buffer showing 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. If there are any

ecologically sensitive areas found within the 15km buffer zone, the shortest distance from the National Park/WL Sanctuary Tiger Reserve, etc should be shown and the comments of the Chief Wildlife Warden of the State Government should be furnished.

- (iv) Collection of one-season (non-monsoon) primary base-line data on environmental quality – air (SPM, RSPM, SO<sub>x</sub> and NO<sub>x</sub>), noise, water (surface and groundwater), soil.
- (v) Detailed water balance should be provided. The break up of water requirement as per different activities in the mining operations vis-à-vis washery should be given separately. Source of water for use in mine, sanction of the competent authority in the State Govt.. and examine if the unit can be zero discharge including recycling and reuse of the wastewater for other uses such as green belt, etc.
- (vi) Impact of choice of the selected use of technology and impact on air quality and waste generation (emissions and effluents).
- (vii) Impacts of mineral transportation - the entire sequence of mineral production, transportation, handling, transfer and storage of mineral and waste, if any, 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.  
Details of various facilities to be provided for the personnel involved in mineral transportation 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 rejects] transportation, their impacts. Details of workshop, if any, and treatment of workshop effluents.  
Impacts of CHP, if any on air and water quality. A flow chart of water use and whether the unit can be made a zero-discharge unit.
- (x) Details of green belt development.
- (xi) Including cost of EMP (capital and recurring) of the coal washery in the project cost.
- (xiv) Public Hearing details of the coal washery to be included with the project include details of notices issued in the newspaper, proceedings/minutes of public hearing, the points raised by the general public and commitments made in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.
- (xv) Status of any litigations/ court cases filed/pending on the project.
- (xvi) Submission of sample test analysis of:
  - i. Characteristics of coal to be washed- this includes grade of coal and other characteristics – ash, S and Hg level etc.
  - ii. Characteristics and quantum of washed coal.
  - iii. Characteristics and quantum of coal waste rejects.
- (xvii) Management/disposal/Use of coal waste rejects

The following general points should be noted:

- (i) All documents should be properly indexed, page numbered.
- (ii) Period/date of data collection should be clearly indicated.
- (iii) Authenticated English translation of all material provided in Regional languages.
- (iv) 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.
- (v) The letter/application for EC should quote the MOEF file No. and also attach a copy of the letter prescribing the TOR.
- (vi) The copy of the letter received from the Ministry on the TOR prescribed for the project should be attached as an annexure to the final EIA-EMP Report.
- (vii) 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.

After the preparation of the draft EIA-EMP Report as per the aforesaid TOR, and the public Hearing conducted as prescribed in the EIA Notification 2006 and the proponent will take necessary action for obtaining environmental clearance under provisions of the EIA Notification 2006.

Yours faithfully,

(Dr. T. Chandini)  
Director

Copy to: Chairman, Chhattisgarh State Environment Conservation Board, 1-Tilak Nagar, Shiv Mandir Chowk, Main Road, Avanti Vihar, RAIPUR-Chhattisgarh – 492001.