

Scrutiny comment on Modification of Mining Plan including PMCP in respect of Kutrumali Bauxite Ore Deposit of M/s LARSEN & TOUBRO Limited in Kalahandi and Raygada districts of Odisha State.

GENERAL:

- (1) The mining plan was approved for 699.037 Ha vide letter dated 19.06.1995; However, in current submission i.e. modification of Mining plan, document has been submitted over an area of 698.870 Ha. Whereas as per, DGPS survey the area is mentioned as 696.734 Ha. The modification of Mining plan for different area is not acceptable.
- (2) Para 3.6.: Reason of modification is not described properly & clearly in terms of Rule 17(3) of MCR, 16 or Rule 10 of MCDR, 88.
- (3) Applicant is a company. Hence a latest list of board of directors duly certified by competent authority along with address/contact nos. to be submitted along with Undertakings from board of directors regards to their/his working in other firms / company/ organization.
- (4) Consent letter, certificates and undertakings needs to be signed by the nominated owner/authorized signatory/power of attorney holder as the applicant is a company. Hence, Resolution passed by the board of directors in this regard should be enclosed.
- (1) Production & ancillary activities of this mine/deposit only to be described in this document. However, Production & ancillary activities of other mine/deposit has been described. Nothing of outside & other lease area to be described in this document.
- (2) CCOM circular no.2/2010 and its addendum regarding geo-referenced mining lease map and ML boundary pillars to be implemented.
- (3) The proposed category of Mines /deposit to be mentioned on cover page.
- (4) It is observed that, current document has been prepared accordance to the new “IBM manual for Mining Plan appraisal-2014”. However, in some chapters like Mine drainage, Use of Mineral and Mineral reject, PMCP etc. the guideline is not followed properly.
- (5) Submitted document is very much descriptive/lengthy. It should be precise. The contents should be depicted as far as possible on plans and sections duly supplemented by tabular statements / charts / diagrams or sketches in support, keeping the descriptive matter to the minimum essential.

GEOLOGY & RESERVES:

- (6) Number of Exploratory BH proposed be mentioned in table presented on page A.1-5 and same to be depicted year wise on Borehole plan (drawing PRM-0004).
- (7) Page A.1-4: As per details of exploration carried out, a total 69 BH have been drilled in the area, however, only 35 BH have been shown on the plan. Verify and rectify.
- (8) As per prospecting report a total of 1970 meter of drilling and 1910 number of meter wise samples were carried out, however, in present submission same has been reported to be 1948 meter and 1968 samples. Verify and rectify.
- (9) Some of the points as indicated in Geology and Exploration Chapter of “IBM manual for Mining Plan appraisal-2014” are not attended.
- (10) The geological boundary of exploration level should be as per UNFC. Area explored under different level of exploration may be marked on the geological plan and UNFC code for area considered for different categories of reserve/resources estimation may also be marked on geological cross sections. Further, Specific date to be mentioned on which Reserve & resource is estimated.
- (11) Page A.1-8: It is mentioned that “ Mining Zone have been demarcated considering Overburden/mineral reject to Ore ratio less than or equal to 2”. The reason for such consideration need to be justified with documentary evidence.
- (12) From Geological plan it is observed that some of the area (North Western part) is yet to explore, however, same is considered under explored area. Need to be verified and rectified. Accordingly table presented on page A.1-13 to be revised.
- (13) It is observed that mineral resource is estimated using Geo-Mining Software. The method of resource estimation should be discussed in details along with parameter like, ellipsoid dimensions, minimum and maximum composing sample length, block size, minimum and maximum sample considered for block estimation, Maximum search distance in horizontal and vertical plan, range, nugget effect etc. Else software logic be given in detail. Further, all the parameter considered as well as all input to the software should be described in detail with software generated calculation.
- (14) Page A.1-11: Dilution of 1 meter thick zone of Bauxite at roof with lateritic OB and bottom with PLK to be justified. Block wise geological resource also should be given in table A.1-3.

- (15) Page A.1-12: Table presented on page also need to incorporate sectional area, tonnage factor considered etc. and tonnage factor considered should be justified with documentary evidence.
- (16) The justification of UNFC code in respect of E and F axis be given.

MINING:

- (17) Ref. Table A.2-1: OB/SB/IB estimated is NIL, then how ROM/OB ratio arrived is not clear. The same is wrongly calculated. Else, needs to be clarified.
- (18) In view of scientific mining and protection of environment with progressive closure of the mine, excavation/development should be proposed from one side/end in consolidated manner. So, that mined out area should be available for simultaneous restoration/plantation. Hence instead of proposed excavation from two pits in opposite direction, excavation proposal to be given from one pit in one direction in consolidated manner.
- (19) Year wise Development sections have not been submitted. From, Development plans; it is observed that Pit bench profiles are proposed in haphazard and un-systematic way. The same to be re-designed.
- (20) The detail section wise backup calculation of proposed excavation of Bauxite, Mineral reject, top soil etc. to be given along with development sections.
- (21) Location of mine workings proposed has not been referred by grid lines in text part of documents.
- (22) A consolidated table to be given in text for Mining equipment proposed/required during plan period.
- (23) Drilling/Blasting pattern and design parameters are not explained properly. Optimum Charge per delay to be considered based on safe blast induced vibration limit considering nearby surface features; accordingly most suitable drilling & blasting design along with initiation/firing pattern should be proposed.
- (24) Conceptual Mine plan should be up to the end of life of mine taking into consideration of the available reserve and resources describing the total excavation, Disposal of waste, Sub-grade generation and its beneficiation/utilization, mine development, manpower and equipment requirement, conceptual exploration, land degradation, waste required and its availability for back filling the ultimate pit, reclamation and rehabilitation, Proposal of any expansion, etc. showing on a plan with few relevant sections. Hence complete chapter needs to be revised.
- (25) Post mining land use at final/conceptual mining stage to be described.

MINE DRAINAGE

- (26) This chapter is not dealt with properly. As reported, mine/deposit is situated at high altitude, having hilly & undulating terrain with large catchment area and substantial quantity of rain water to be flow through the area. However, adequate rainwater management plan i.e. drainage plan along with arrangement for arresting solid wash off is not incorporating with engineering details & material to be used for its erection/construction. Therefore, adequate rainwater management plan i.e. drainage plan along with arrangement for arresting solid wash off should be prepared, incorporating engineering details & material to be used for its erection/construction. Complete chapter needs to be re-casted as per "IBM manual for Mining Plan appraisal-2014"

STACKING OF MINERALS REJECT/ SUB-GRADE AND DISPOSAL OF WASTE

- (27) Ref. Table A.2-1 of mining chapter, OB/SB/IB estimated is NIL. Backfilling proposed by Sub-grade material/Mineral reject is totally against the conservation of mineral. The same needs to be rectified.
- (28) The quantity of Mineral reject mentioned on page A.4-1 does not match with the quantity mentioned in table A.2-1. To Verify and rectify.
- (29) Storage/Stacking of Sub-grade material/Mineral reject in earmarked area to be described with mRL and area on year to year basis with description of the manner of its disposal. Specific proposal for environment protection measures i.e. Retaining wall, garland drain, check dam, settling ponds etc. around this, to be given year wise in quantified terms.
- (30) Back filling proposal has not been explained properly. Exhausted area to be backfilled by OB/Waste, if there, to be specified with mRL and area on year to year basis with description of the method & manner of disposal of waste.
- (31) Overburden, Mineral reject and top Soil dumps should be proposed on the non-mineralized ground or temporary dumping for a short period to be proposed in mineralized area with technical constraints & justification.
- (32) Build-up of dumps from year to year to be mentioned in text w.r.t. designed capacity of dumps, bottom and top mRL of individual terrace, individual terrace slope with description of method & manner of disposal of waste should be mentioned.
- (33) Proposal of blending of Sub-grade/Mineral reject to be given in the interest of conservation of Mineral. Blending ratio also should be mentioned.

USE OF MINERAL AND MINERAL REJECT:

- (34) It is observed that information furnished in this part of the text is not given para wise as the “IBM manual for Mining Plan appraisal-2014”. Hence, complete recast of the chapter is required.

PROCESSING OF ROM AND MINERAL REJECT:

- (35) Adequacy of processing facility should conform with ROM production proposed. Process flow chart of processing facility with material and water balance chart should be given with grade & quantity of feed material.
- (36) Quantity (cum per day) of water required for mining and processing and sources of supply of water, disposal of water and extent of recycling to be indicated. Water balance chart may be given.

PROGRESSIVE MINE CLOSURE PLAN

- (37) Environmental Base line information & EIA : It should be clarified that base line data collected & assessment done by which agency, period of data collection & assessment and whether it is conforming to the norms of MoEF.
- (38) Mitigation measures of impacts associated with mining i.e. mainly related to air, water, noise, vibration, land, aesthetics etc. are not given. The same to be elaborated.
- (39) Summary of PMCP proposal is not given in text as per “IBM manual for Mining Plan appraisal-2014; proposal for stabilization, reclamation & rehabilitation, waste dumps management, back-filling etc. are not mentioned. Specific proposal should be given year-wise in absolute quantified term.
- (40) In Para “Disaster Management and Risk Assessment:”, risk analysis of different mining operations and safety management plan needs to be given. Also, Briefly describe about emergency plan proposed for quick evacuation or measures to be taken during high risk accidents like landslides, subsidence flood, inundation in underground mines, fire, seismic activities etc. The capability of lessee to meet such eventualities and the assistance to be required from the local authority may also be described. The name of officials along with telephone number may be given; responsible to take appropriate action during such eventualities.
- (41) The table given in the appendix A.8-4 for year wise proposal made in progressive mine closure plan and financial assurance, needs to be given in text part of the document.
- (42) Year wise proposed location of plantation to be mentioned in tabulated form in text part of the document and same to be depicted in reclamation plan.

FEASIBILITY STUDY REPORT:

- (43) Financial analysis is not carried out as per UNFC guidelines. Economic evaluation of the project is not carried out properly like Cost of Production (CPT), Cost-Benefit analysis and Financial appraisal are not carried out based on real time cost involved and also Viability of the project up to the ultimate depth has not been analyzed. Further, In the UNFC feasibility study, following important parameters is not dealt with:-
- a. Assessment of IRR (Internal Rate of Return) and NPV for the project life.
 - b. IRR based on operating cost, reclamation/ rehabilitation cost, closure cost and other important parameters as per UNFC guidelines for the life of the project on the basis of ore body geometry, i.e., depth, width, length etc. as estimated and considered for reserve/ resource estimate.
 - c. Cash flow statement for the period considered for assessment of IRR.
 - d. Sensitivity analysis on cash flow due to market changes, i.e., cost of operation, sale price etc.

PLATES:

- (44) Authentic Ore block area plan duly certified by the competent authority of state Govt. is not submitted. Hence, basis of the drawings/plans submitted with the document is not clear. Hence, Authentic Ore block area plan duly certified by the competent authority of state Govt. should be submitted.
- (45) Submitted DGPS Plan/map is not certified or authenticated by the competent/concerned authorities of State govt. Hence, Certified DGPS Plan/map should be submitted.
- (46) It is observed that most of the drawings/plans are not prepared on prescribed scale (1:2000) as specified in rule 27 of MCDR, 1988. Further, relaxation/permission from competent authority is also not enclosed to prepare drawings/plans on different scale than as prescribed in rule 27 of MCDR, 1988.
- (47) Over plans/Maps Scale is not written clearly. Scale of each drawings/plans should be written clearly numerically.
- (48) All drawings/plans are not signed and certified to be correct by the certified Surveyor/ Qualified Person/ Mine Manager/ Mining Engineer / Mining Geologist. All plans and sections should be signed with date and certified to be correct by the certified Surveyor, Qualified Person, Mine Manager, Mining Engineer and Mining Geologist as per provisions of Rule 30 of MCDR, 1988 and Rule 66 of MMR, 1961.
- (49) The contour value to be shown in all the plans. Further, ultimate pit limit to be shown in all the plans and sections.
- (50) Safety Zone of 7.50 meter to all along the lease boundary to be shown in all plan and sections.
- (51) Forest area, Non Forest area, Surface right acquired area etc. should be marked clearly over all Map/Plan & Surface plan.

- (52) Color code given for different features in plans to be given same in sections.
- (53) Surface Plan indicating existing prominent surface features is not submitted, as per MCDR, 1988. The same to be submitted indicating all boundary pillars coordinates in UTM, Latitude and longitude to be shown in tabulated form on surface plan as well as in the text.
- (54) Geological Plan & Section: The color code/hatching used to display various lithology are not distinguishable, need to be reviewed. Further, Section line to be shown on the geological plan. Direction along which geological section have been drawn to be depicted on the sections. N-S grid line to be depicted on sections.
- (55) Development plans and Sections: Year wise Development sections have not been submitted in instant document. The benches in OB/SB/IB, Bauxite, Top Soil and Mineral reject to be shown on development sections. This plan may be prepared on a suitable easy reading.
- (56) Composite development/excavation plan & Section, depicting proposed excavation of all 05 years to be given. This plan may be prepared on a suitable easy reading.
- (57) Environment Plan: All existing surface features beyond the 60m of ore block area boundary to be shown in detail including permanent features present near to ore block area. Monitoring stations at the strategic points in core & Buffer zone for different environmental components should also be shown over this plan.
- (58) Financial assurance area plan should be submitted showing only outline of proposed five years mining activity/working as per “IBM manual for Mining Plan”.
- (59) Progressive Reclamation Plan as per para 8.3 of “IBM manual for Mining Plan appraisal-2014” to be submitted indicating all the proposed environment protective measures like retaining wall, garland drain, settling tank, plantation etc.
- (60) Key plan is not prepared as per the provision of MCDR, 1988. Same to be prepared as per the provisions.

ENCLOSURE:

- (61) Few photograph of the Boundary pillars, present land use to be attached.
- (62) Copy of surveyor certificate to be enclosed.
- (63) Self-attested copies of qualification & experience certificates as required for qualified person to prepare mining plan under MCR’2016 should be enclosed.
- (64) All the pages of the text and relevant pages of the annexure to be signed by qualified person.
- (65) Copy of prospecting report to be submitted as annexure and it should be signed by Qualified Person.
- (66) In view of above, wherever necessary correction required to be made.
- (67) All the annexure to be properly indexed/numbered/paged and signed by the Qualified persons.

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