Scrutiny comments on the modified Mining Plan along with progressive mine closure plan of Macarxendo TC.No. 09/49 over 94.7287 ha of M/s Vedanta Ltd in village South Maulinguem of Bicholim Taluka of North Goa district submitted under rule 22(6) and 23(B) of MCDR 1988 for the period from 2015-16 to 2017-18.

General:

1. In cover page mentioned as Modified Mining Plan is submitted as per 22 (6) of MCR, 1988 and inside the certificate it refers in MCR, 2016.
2. Preamble: The last approved document was Mining Plan for renewal of lease and its period expired on 31.03.2013. It was not the scheme of mining, as stated in text. It should be corrected as 'First five year period of scheme of mining and annual programme & Plan of approved mining plan. Further, details of the environment clearance granted for Sanquelim Iron ore mine, capping on production as per State Government decision and basis for lease-wise capping on production is to be given. Copies of these may also be enclosed in annexure.
3. Index for plates: Universal format as per IBM manual for appraisal of mining plan 2014 is not used for preparing the scheme of mining including PMCP and annexure, various plan and section. Various plan & sections are Location plan, Lease plan, DGPS plan, Key Plan, Surface plan, Surface Geological plan & sections, Five-year development & production plan & sections, Conceptual plan & sections, Financial assurance plan, Reclamation plan and Environment plan. Sub-para heading from the universal guidelines is enough in text instead of explanatory information also.
4. Index for plates: It is observed that Conceptual plan up to lease period with longitudinal & transverse sections, reclamation plan and financial assurance plan are not submitted as per requirements in the modified mining plan. It is not given & discussed about any Ground control points in the lease area. Approved document Letter No & date are wrongly mentioned.
5. Reason for not achieving the proposed excavation from 2009-2010 onward may be explained. The year-wise production proposed for other constituent leases of the mine may also be indicated so as to keep overall production within the capping allotted by the state government.
6. Existing dumps are located inside the lease area and quantity of waste, mineral reject and/or sub-grade ore available in the dumps as on date with recovery factor, based on exploratory data may be given for future use.
7. Feasibility report should be kept in continuation of text at respective Para, as it is part of modified mining plan document. Please refer IBM manual for appraisal of mining plan 2014.
8. A bound page compilation of bore holes logs drilled so far in the Macarxendo iron ore mine in one set is separately to be submitted to check UNFC compliance.
9. When a lessee is unable to commence the mining operations within a period of two years from the date of execution of the mining lease or discontinuation of mining operations for reasons beyond his control, he has to submit an application to the State Government, explaining the reasons for the same. The reasons for suspension of mining activity and permission for same if any should be discussed.

Geology:

1. Page-13:- Highest and lowest mRL are mismatching with text & plan. Details given in exploration table is not matching with Form-J submitted to this office.
2. Geological plan and sections have to be prepared on natural scale i.e. scale of 1:2000 covering complete lease area at 50m interval as per UNFC guidelines and Minerals (Evidence of Mineral Contents) Rules 2015.
3. Additional exploration is to be proposed to know the continuity of ore in depths and to complete the exploration as per UNFC compliance. Many sections are not having sufficient Boreholes and many boreholes are incomplete to find out the contact zone.

4. The basis of bulk density and recovery factor should be given on the field tests conducted for different grade of minerals. Test result on moisture contents may also be included. Cut-off grade based on international/domestic market conditions, mining and processing losses i.e. generation of tailing etc may also be considered for estimation of reserves & resources. Refer Minerals (Evidence of Mineral Contents) Rules 2015 for exploration grid interval to be followed for UNFC reserves & resources estimation, which indicates 100-50m or closer interval borehole spacing along strike for G-2 and 50-25m or closer interval borehole spacing along strike for G-1 category of lenticular bodies. Range of Fe content is not given for high, medium, low, marginal, lumpy and siliceous grade
5. Detailed estimation table for reserves & resources as per UNFC has to be given in text. Minerals (Evidence of Mineral Contents) Rules 2015 has to be followed for exploration grid interval for UNFC reserves & resources estimation. Beyond & below the depth of boreholes, it should be considered as resources as per above said rule.
6. Geological reserves & Resources have to be shown in table to compare as per previous approved plan and as on now. How much reserve has increased or depleted to be explained.
7. Using single Boreholes or without boreholes, section has drawn and ore is considered under G-1 Category. As per Minerals (Evidence of Mineral Contents) Rules 2015, it has to be considered as resources only.

Mining:

1. Number of waste and mineral reject dumps with size of each dump i.e. L X W X H and total quantity of waste material in the dumps has to be given. Mineral reject dumps located inside the lease for recovery of salable grade iron ore, if any in future and its basis has to be given in introduction/preamble.
2. First year proposed development area is nearer to Safety barrier of Nalla & Road, hence the proposed area required to be changed.
3. Bulk density of waste rocks, ROM ore has to be indicated based on test result for different grades of ore and other rock types.

Conceptual planning:

1. Future waste generation is indicated; however waste generation in the past is not elaborated. Total waste generated since beginning of mining operations, likely to be generated during next two blocks of five-year period, total number of dumps in the lease area, size of the dumps and quantity of waste/reject there, area reclaimed & rehabilitated so far and likely to be reclaimed & rehabilitated upto lease period, proposal of dumping/backfilling during ensuing modified mining plan period, re-handling of waste dumps for advancement of faces, re-handling of reject dumps for recovery of salable ore during subsequent five-year blocks, afforestation carried out so far and further planned upto lease period with area covered may be included in the conceptual planning. Conceptual plan and sections must show the geological lithologs at pit bottom based on exploratory data.
2.

Mine drainage:

1. Minimum and maximum depth of water level is not given based on own monitoring of nearby wells and water bodies or based on studies/publications of CGWB/SGWB, although given in EC.
2. Ambiguous statements are used for different sub-para of mine drainage i.e. minimum and maximum depth of water level, quantity & quality of water likely to be encountered (seepage as well as discharge), pumping capacity and Regional & local drainage pattern w.r.t. Valvota river. The drainage system to river Valvota is not given.

3.

Stacking of mineral and disposal of waste:

1. Year-wise profile of Surface dump i.e. length, width, height, volume, area covered, number of terraces and angle must be given in table along with protective measures.
2. Waste management plan and Environment management plan are to be shown on year-wise development plan & sections. Sufficient relevant sections should be given to show development, waste management and afforestation etc.

3.

EMP and PMCP:

1. Few photographs of the working area, dumps, afforestation, mineral stacks of different grade, pits and tailing pond showing baseline information as on date may be enclosed.
2. Impact of temporary backfilling inside the pit on discharged water quality is not indicated; as floating pumps and backfilled area are nearby.
3. Mined out land: Year-wise proposal for afforestation is to be given with location, number & Species. Reclamation plan is also not prepared by depicting year-wise progress for afforestation, retaining wall, check dams, drain etc.
4. The table in Para 8.3 for year-wise proposals for reclamation & rehabilitation is not given any proposals for next two-years. Table given in IBM manual for appraisal of mining plan 2014 is having format for yearly report under rule 23(E)2 of MCDR 1988 and it needs suitable modification for year-wise proposals to be included for next five-year period. It is therefore advised to delete the column 'Actual' as well as non-applicable rows for next two-years proposals i.e. cumulative number of plants in dump management, afforestation done and cumulative number of plants in management of worked out benches etc. Year-wise proposals for afforestation, retaining wall, check dams, drain etc may be included.

PLATES:

1. Key plan:- Land use pattern i.e. forest, waste land etc is not shown as per rule 28(5)(a) of MCDR 1988. Forest land in surrounding area has to be shown. The predominant wind direction should be shown as per the wind rose diagram for the year instead of simply one direction in a particular season. Different colour and line pattern has to be used for village & Taluka boundary as well as lease & survey boundary for ease. In the key palan river valvota flows inside the lease area.
2. In all index plans, Cancagalle Tolop Lease is highlighted instead of Macarxendo Lease. Safety Barrier for Nalla, Village Road is not marked in any Plan & sections.
3. Surface Plan: Natural vegetation over virgin area is not shown. Date of survey i.e. 01.04.2015 is too old and needs updation. In last plan period there is no production & only 44150 tons of waste has been handled, but when compared to previous approved plan, new pit has been opened for length of 150m with 5m depth nearer to Lisboa South pit. Dump yard has reduced its height about 20m RL and advanced towards football ground when compared to previous approved plan. Similarly Boreholes D-96, D-89, D-63, D-95 are in backfilled area of 10m depth but in 2009 documents they have been shown in virgin ore bands.
4. Surface Geological Plan & sections: All boreholes should be marked with type, diameter, inclination, collar level and depth. Surface Geological Plan may be prepared to represent all above requirement in a systematic manner.
   i. Boreholes above pit bottom must be shown by hatched lines in sections and old boreholes hanging in air above the pit bottom are not required.
   ii. An attempt may be made to prepare slice plans for estimation of reserves & resources due to complex deposit with intrusion and shape of the mineralised zone etc. Refer sub-para-k of Part-A Geology & Exploration of universal format for Mining Plan.

iii. All sections Lateral and vertical extrapolation of maximum 25% beyond the borehole may be considered for G-1/G-2 category; accordingly all the sections may be modified for showing UNFC reserves category. UNFC code is not marked in Geological Plan & sections.

iv. Geological plan & sections are not updated, i.e, in plan, S-11 after Borehole D-61 there is Laterite in surface but in section the Hematitic ore is passing to surface.

v. UNFC category is to be written on geological Plan & sections. Different colour/code is not required for UNFC. Same color for Geological lithology has to indicate on plan & sections. Hematitc are shown as ore in plan and mineral reject in sections.

5. Environment Plan: Following details may include i.e. forest land, government land, private land with different colour code, pits etc within 60m distance and roads, HT electric lines, other lease areas with T.C. number within 500m distance as per rule 28(5)b of MCDR 1988. Pit extent upto lease area is not enough and all the benches of the pit are required to be shown upto 60m distance.

   Trees density per hectares of the existing natural vegetation is not shown. Refer Para 4.4.4 of IBM manual for appraisal of mining plan 2014.

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