

SCRUTINY COMMENTS ON DRAFT REVIEW AND UPDAION OF MINING PLAN IN RESPECT OF THAGADUR CHROMITE MINE (ML.NO.2477) IN CHANNARAYAPATNA TALUK OF HASSAN-DISTT OVER AN AREA OF 614.99 HA OF M/S MYSORE MINERALS LIMITED.SUBMITTED FOR APPROVAL UNDER RULE,17(1) OF MCR,2016. NON-FOREST AREA, A(MECHANISED, FOR THE PERIOD 2017-18 TO 2021-22.

1.Cover page: (i) Key person should be replaced as “Qualified Persons”. (ii) Mine code (11KAR11004) and Reg. NO under rule 45 of MCDR 1988 (IBM/4369/2011) have not been mentioned. ML. no. written incorrectly. The method of working is written as A (OTFM), need to be replaced with A(Mechanized).In the light of the above remarks, the text and the plates may be attended, wherever applicable.

2.Certificates of QP and Lessee: (i) The certificates may be appended at end of the text part as per ‘Universal format’. (ii) The qualifications and experiences of Qualified Persons (QP) should be as per 15(1) of MCR 2016 with necessary documentary proof. The mentioning of RQP/Key persons in certificates, Plates and text part should be replaced as Qualified Person (QP). (iii) The rule and name of document should be checked & corrected at certificate of the lessee.

3. Introduction: Number of Chromite mines held by M/s MML should be checked and corrected w.r.t. enclosed Annexure-1.

4. Para 1(a): Address of the lessee and e-mail etc., have not been updated at web-site registration under Rule 45 of MCDR 1988.

5. Para 1(b) : The copy of resolution of board of directors regarding signing of documents has not been enclosed. Further, name of MD has not been matching with enclosed list of board of directors of M/s MML.

6. Para 1(f) : The details of QP (qualified person) should be modified as per rule 15(1) of MCR 2016. RQP certificate number furnished need to be deleted and based on the same, wherever such certificate number given in the text may be deleted.

7. Para 2(a) (ii): The co-ordinates any one BP should be furnished.

8. Para 3, details of approved MP/SOM given, but after the 2007 approval, there is no other approval, except 2014 may be explained.

8. Para 3.3: (i). Review of exploration given from 2012-13 to 2014-15 only, but it should have been covered up to till date of 2016-17. (ii) The production and development upto December 2016 may be consider for review. (ii) The overall deviation figures in respect of production and afforestation were not matching. The same may be checked and corrected.

9. Para 3.4: The present status for compliance of exploration deviation has not been discussed.

Part-A

Geology & Exploration:--

10. Para 1(c): (i) Location of Talc-Tremolite schist has not been discussed. (ii) Dip mentioned for Gneisses may be checked and corrected. (iii) Strike length and width of reef Titaniferrous Magnetite ore body/deposit has not been discussed. (iv) The occurrence of float type of chromites deposit may checked and corrected as no such deposit during field observation.

11. Para 1(e) (i): There is no exploration during last SOM period. The exploration for Titaniferrous Magnetite ore body/deposit was carried out before approved of last SOM document. The same may be

clearly mentioned. From the exploratory pits and trenches, it is observed that, maximum depth under taken in the exploration is up to 1.5m, which is not appropriate, why not under taken more than 1.5m may be explained, when the deposit is expected much below than the depth of TP/ Trenches carried out.

12. Para 1(e) (iii):The chemical analysis report of **few latest** representative Chromite and Titaniferrous Magnetite samples by NABL accredited Lab or Govt. Lab should also be appended. Further, the enclosed chemical analysis report Titaniferrous Magnetite samples has not been analyzed for TiO₂ content. As per Atomic Minerals Concession Rules 2016, it is also advised to carry out analysis/ test of Titaniferrous Magnetite sample for U₃O₈ & ThO₂ content at AMD as communicated vide this office letter No 279/263/91-BNG dated 16/12/2016.

13. Para 1(f): The copy of CCOM's permission letter regarding preparation plan in 1:5000 scale has not been enclosed.

14. Para 1(f) and (h) : The part Geological plans were prepared in 1: 2000 scale and Cross sections at 100 m intervals. Accordingly, necessary correction to be made in the paras.

15. Para 1(i): (i) Lateral extent area already covered under G-1, w.r.t. total mineralized area both for Chromite and Titaniferrous Magnetite should be mentioned. (ii) The proposed exploration should be as per Minerals (Evidence of Mineral Contents) Rules 2015 (iii). The inclined core-boreholes should be proposed with an aim to confirm depth continuity of Chromite ore body at least upto UPL and converts G-2 level to G-1 in all blocks. (vi) The core-boreholes should also be proposed with an aim to confirm depth continuity of reef Titaniferrous Magnetite ore body and trails pits in float ore area as per MEMC Rules 2015 (v) The proposed expenditure likely to be incurred towards exploration should also be mentioned.

16. Para 1(j) and (k): (i) Bulk density and recovery factor considered may be based on field tests and confirmed. (ii) The occurrence of float type of chromite deposit may checked and corrected as no such deposit found during field observation. (iii) Page No-28:-- +10 % Cr₂O₃ Chromite ore may be reflected as saleable as discussed during site inspection. (iv) Reserves and resources tables mentioned at page no 30 and 31 may be removed as per Universal format and avoid repetition. (v) The assessment of reserves /resources and production of Dunite, Talc and Quartz mentioned at page no-31 may be removed as "Minor Minerals". (vi) **The enhancement of reserves of Chromite w.r.t. last approved SOM document is not appropriate without any exploration.** Moreover, the width of chromite ore body considered should be as per last approved SOM document and based on outcome of enclosed boreholes logs. Accordingly, the assessment of reserves /resources of Chromite may be modified. (vii) The assessment of proved float ore reserves of Titaniferrous Magnetite (111) may be classified under 122 (Probable reserves) based on exploration grid pattern as per Minerals (Evidence of Mineral Contents) Rules 2015. Accordingly, the assessment of reserves /resources of Titaniferrous Magnetite may be modified.

17. Para 1(l): (i) The figure of Titaniferrous Magnetite resources mentioned at G-3 level of exploration may be classified under G-1 and G-2 based on exploration level. (ii) Sub-paras (a) to(c) have not been discussed. (iii) Foot note as per universal format may be incorporated below final reserves /resources tables. (iv) The grade of Titaniferrous Magnetite ore may be based on chemical analysis reports.

18. Para 2(a): the method of mining indicated in the existing & the proposed method as A (OTFM-other than fully mechanized mine), which is need to be changed as A(Mechanized). Besides, in Titaniferrous Magnetite ore, carrying out mining by keeping single bench height of 1m, what is the reason for proposing 1m height, is not justified. **Further, the slope of faces, direction of advancement, approach to the faces & specification of roads, etc to be marked. Also, the existing dumps spread parameters, height, slope protective works etc., to be marked. The bench wise, mRL wise, opening reserves, exploitation and the closing balance should be furnished for the proposed periods.** The Page no-35: The production of Dunite, Talc and Quartz mentioned at page no-35 may subject to approval of MP at state DMG as "**Minor Mineral**". Moreover, there is no demand for Serpentine. Accordingly, necessary correction to be made, wherever applicable.

19. Para 2(b): (i) total in-situ tentative excavation should also include ROM production. Further, the generation of Mineral reject other than ROM may be reflected as NIL in this mine. The grade of mineral reject of ROM chromites should be mentioned. The material above threshold value may be stacked separately. (ii) Foot note as per universal format may be incorporated below table. (iii) The development and production of Titaniferrous Magnetite ore is subjected to outcome of analysis and test at AMD as

communicated vide this office letter No 279/263/91-BNG dated 16/12/2016. (iv) Concurrent back-filling in Titaniferrous Magnetite float ore area should be proposed as discussed during site inspection. The necessary efforts to be taken for complete exploitation of reef /vein of Titaniferrous Magnetite after confirmation with exploration. (v) Proper justification should be given for proposed location of mining. Further, the proposals drawn for the year 2017-18, from the south block for Chromite exploitation, on western & eastern sides, wherein few benches shown in the west sections, but no benches of old workings were brought out in the east sectional views. Care should be taken for showing the old excavations/ benches, than showing the new bench proposals to be appropriate, both in plans & sections. Pl refer tables of chromite production in page –no.36. In page-38, instead of mentioning Titaniferrous Magnetite/ Magnesite is given, which may be attended, wherever applicable in the text and in the plates. In the light of the above remarks, the development & production plates of remaining years may be dealt with care.

20. Para 2(e), under, mine layout, it is given that, Titaniferrous occurs in the form of float ore & reef/ bands, but during the field observation, it is almost big insitu boulders in scattered places, para need to be attended/ corrected appropriately.

21. Para 2 (f):(i)The conceptual Mine planning may to revised to end of ML period, considering the working permission during year 1976, date of grant of ML and final decision at state Government on the matter etc with enclosing related correspondence. Accordingly, the area requirement for mining & other allied activities at end of lease period may be revised based on remaining period. (ii) Exploration proposed and reserves/resources should be modified as per scrutiny comments at para-1. (iii) The proposed afforestation, retaining wall, garland drain and other environmental protective measures during conceptual period have not been discussed. (vi) The quality of generation of sub-grade ore and wastes during conceptual period has not been discussed. (v) Concurrent back-filling in Titaniferrous Magnetite float ore area has not been discussed. This chapter/ para may be attended in line with the remarks, given in mining chapter para 2(a) & (b), if applicable.

21. Para 3(c): The quantity of rainwater likely to be accommodated in the pits have not been discussed.

22. Para 4(a): (i) Any generation of sub-grade ore between economic cut-off grade and threshold value of Chromite ore & their utilization/stacking have not been discussed. (ii) Concurrent back-filling in Titaniferrous Magnetite float ore area may be discussed and properly reflected in all relevant paras and tables.

23. Para 4(c): Proposed environmental protective measures for dump management such as retaining wall, garland drain, afforestation etc has not been discussed. Further, the location of top soil dump has not been discussed.

24 Para 5(e): (i) Economic cut-off grade of Titaniferrous Magnetite and chromite may be mentioned. How the available ore in the mine will meet the user requirement should be discussed. (ii) Utilization of +10 % Cr₂O₃ grade of Chromite ore with proper blending may also be discussed.

25. Para 8.1:land use pattern table at end of lease period may be modified as per scrutiny comments at para 2(f).

26. Para 8.1 (f): Presence of human settlements if any within the ML has not been discussed

27. Para 8.1 (h): Presence of temples within the ML has not been discussed.

28. Para 8.2 (i): Area likely to be degraded at end of life of mine (i.e. end of lease period) may be modified as per scrutiny comments at para 2(f).

29. Para 8.2 (x): Presence of temples within the ML has not been discussed.

30. Para 8.3.1: Concurrent back-filling in Titaniferrous Magnetite float ore area has not been discussed. Besides, it is given that, 21.92 ha area is utilized in this scheme period, which should be corrected as review & updation of mining plan.

31. Para 8.3.5: (i)The proposed year-wise summary of the protective measure for reclamation and rehabilitation works should be furnished (ii) Number of plantation proposed should be increased to cover

earlier dumped area also (iii) Year –wise proposal of construction of retaining wall and garland drain should also be given. (iii) Concurrent back-filling in Titaniferrous Magnetite float ore area and year-wise afforestation on back-filled area should be properly reflected.

Annexures:

31. Enclosed borehole logs should be certified and signed by qualified persons/ Geologists.

32. Feasibility Study Report: (i) Reserves/resources, production schedule, exploration proposals method of mining, etc should be modified as per as per scrutiny comments mentioned above. This may be brief and self appraisal. (iii) Economic Evaluation chapter:-- The cost of production per tonne has not been mentioned. Proposed operation cost should also including payment to NMET (2 % of Royalty) and DMF (30 % of royalty). Economic Evaluation chapter may be discussed in detail with NPV & IRR. Accordingly, economic viability may be made.

33. Affidavit from the lessee regarding that no matter is pending against the lease area on the following issues. (1) Issues relating to illegal mining with the State Government. (2) Royalty and Revision matters with the State Government. (3) Safety and Environment issues of General Public Concern. (4) Public Interest Litigation (PIL) and other Court cases etc, has not been enclosed.

34. Annexures-14 & 15 should be placed in the regular text part itself, instead of annexures side.

35. All the ML boundary corner pillars should be brought out through photographs, including the mine workings for Chromite & Titaniferrous Magnetite ore and the respective waste dumps for reference.

PART-B--Plates:

34. All plans and sections should bear a certificate from the QP that “the plans and sections are prepared based on the lease map authenticated by the State Government”.

35. In title of all the plates, the purpose of document may be checked and corrected as “Review and updation of Mining Plan”, including the rules. Further, in all plates, Key person/RQP should be replaced as “Qualified Persons”.

36. Plate No. 1(key Plan): The proposed environmental monitoring stations should be properly highlighted. The plan should be as per rule 28(5)(a) of MCDR 1988.

37. Plate 3: (Surface Plan): Mineral stack yard of Chromite and Titaniferrous Magnetite ore may be reflected with separate colour code in plan & index.

38. Plate 4 (4A to 4C): (Geological Plan):--- i) The composite Geological plan in 1: 5000 scale has not been enclosed. (ii)The exploration proposals should be modified as per scrutiny comments at para 1(i). Proposed core boreholes locations should properly reflected with easily recognizable colour code. (iii) Strike and dip of the formation may be mentioned properly. (iv) Lateral extent of area covered under G-1 and G-2 level of exploration at North block should be modified as per scrutiny comments at para 1(j) & (k)

39. Plate 4-A1 to 4C1:(Geological Cross Sections):--- (i) The proposed boreholes location should be as per scrutiny comments at para 1(i) & reflect the locations in sections with dotted lines. (ii) Modified width of chromite ore body and UNFC codes of Titaniferrous Magnetite should be as per scrutiny comments at para 1(j) & (k). (iii) The boreholes should also be reflected in longitudinal sections. (iv) The core-boreholes should also be proposed with an aim to confirm depth continuity of reef Titaniferrous Magnetite ore body and trails pits in float ore area. Depth projection of ore body should be based on projection of exploration output. Further, proved float ore reserves of Titaniferrous Magnetite (111) may be classified under 122 (Probable reserves) as per scrutiny comments at para 1(j) & (k).

40. Plates No. 5 series (Production and development plans and sections) : (i) the proposed production and development should be modified as per scrutiny comments at para 2. (ii). Further, the proposals drawn for the year 2017-18, from the south block for Chromite exploitation, on western & eastern sides, wherein few benches shown in the western sections, but no benches of old workings were brought out in

the eastern sectional views. Care should be taken for showing the old excavations/ benches, than showing the new bench proposals to be appropriate, both in plans & sections. Besides, it is expected to indicate in each year workings, at the end of working for the year 2017-18 as on 31/3/2018. Similarly, for all the years up to 31.03.2022 respectively.

41. Plate 7 and 7A (Conceptual Plan and Section): The conceptual plan/section should be modified as per scrutiny comments at para 2(f). Further, the proposals and incorporated table should be modified accordingly to conceptual period i.e. end of ML period. Representative conceptual section of north block should also be enclosed. The land use pattern shown for the life of the mine found to be not correct. At the end of the life of the mine, whatever the area shown for mineral storage, will not continue, even at the end of the life of the mine, there is a possibility of getting exhausted and free from the storage. Hence, this should be attended appropriately. Further, the water pond brought out in the northern block is also not correct, since it is in the higher elevation, how it is possible to have water pond may be explained.

42. Plate No-8 (Environmental plan): Water monitoring station at water discharge point of ML area should also be proposed.

43. Plate No-9 (Reclamation Plan): (i) proposed environmental monitoring stations have not been shown in core zone. (ii) Water monitoring station at water discharge point of ML area should also be proposed. (iii) Concurrent back-filling in Titaniferrous Magnetite float ore area and year-wise afforestation on back-filled area should be properly reflected.