

Scrutiny comments on examination of Review of Mining Plan along with PMCP of Patmunda Manganese Mine of M/s Sun Alloys & Minerals Ltd. over an area of 43.532Ha in Sundargarh District of Odisha State .

GENERAL:

1. In introduction chapter brief history of the mines has not been described with present status of mining operation, i.e date of discontinuance and reason etc. with documentary evidence marked with annexure. Earlier the lease was declares lapse by State Govt., however the present status of lease and order passed by State Govt. if any have not been furnished.
2. As per lease deed, ML was granted for 10 years from 12/02/1996, however renewal of lease period and further extension of lease period in view of section 8A of MM(D&R) Amendment Act 2015 has not been furnished with documentary evidence. The execution of supplementary lease deed for reduced ML area (43.532 ha) has not been furnished and not described in text.
3. Page no.-4, under the item "name of the applicant" the name of nominated owner is to be furnished. Page no.-8, the co-ordinated of the boundary pillars in terms of latitude and longitude and in UTM co-ordinates have not been furnished. All the co-ordinated of the boundary pillars should be furnished and it should be matched with authenticated DGPS plan.
4. In Para 3.1, the date & reference of earlier approved mining plan/review of mining plan/ modified mining plan etc. should be furnished in tabulated format given below.

Sl. No	Mining Plan / Review of Mining Plan/ Modified Mining plan/ Modification of Review of Mining Plan/ FMCP etc.	Lease area / Area (in Ha)	Submitted Under (Rule Reference)	Approval Letter No. & Date	Period

5. The modification of approved mining plan was approved vide letter no. MPM/OTFM/12-ORI/BHU2015-16 on 30/03/2016, however reference of this modification has not been furnished in brief under para-3.2. Page- 10 &11, the review of earlier approved proposal has not been furnished year wise and figures are also miss-matched. Para-3.5, the lease is declared lapsed by State Govt. vide GP no. 743/SM, dated 16/01/2015; however its reference has not been furnished.
6. Lessee is a company. Hence, all certificates, undertakings, consent letter etc. should be signed by the nominated owner only. Extract from the minutes of the Board of director meeting with list of Board of Directors, their phone no. address and declaration of nominated Owner to be furnished.
7. The experience of qualified person should be clearly stated in supervisory capacity in the field of mining as per provision of rule 15(b) of Minerals (Other than Atomic and Hydro Carbons of Energy Minerals) Concession Rules, 2016.
8. The sequence of paragraph and its numbering as per IBM Manual Appraisal MP 2014 has not been covered in text. All the headings as mentioned in the IBM Manual Appraisal MP 2014 should be furnished in all chapters in the text.
9. All the annexure, text and tables in the text have not been properly nomenclature/indexed/ numbered/ paged and signed by qualified person. All the certificates/annexures should bear dated signature.

GEOLOGY AND EXPLORATION:

10. The structural information like strike, dip, dip-direction etc have not been shown. All these information should be reflected on geological plan and section. Further, Ore zone and litho units should be depicted on plan and section based on surface exposure and bore hole logs.
11. Page-18, the details of exploration carried since inception of mining operation to be given in tabulated form i.e. year, BH number, Location (Coordinate), nature of BH (Core/DTH), Depth (max-Min), mineralized/non-mineralized, Inclination etc. The relevant forms for intimation of borehole and borehole logs to be submitted as annexures.

12. The location of the drilled bore holes as furnished in text under para-(e) is not matched with geological plan. The bore hole logs as submitted in annexure is not in standard format and lithology and ore as furnished are not clear and not matched with geological plan and sections.
13. Para (iii), Page--22 & 23, the bore hole wise analysis report as furnished in text are not matched with analysis report as enclosed in annexure. The bore holes ID are also not matched the analysis report. The details of the sample analysis indicating type of sample should be given in tabulated format and nos. of sample analysis from NABL/Govt. lab out of total sample should be furnished along with annexure.
14. Page-24, Para-(iv), the expenditure incurred in various exploration activities carried out by lessee have not been furnished.
15. Page no.26-29, Para-(i), the complete lease area should be proposed to cover under exploration under G1 level at 50m interval in regular grid upto end of mineralization in the year 2021-22 as per provision of rule 12(4) of MCDR2017. The year wise proposal for drilling to be shown in different contrasting color in both Geological Plan and Geological sections.
16. The proposal of exploration to be given in following format:

Year	BH no.	Northing	Easting	Collar RL	Core/DTH	Meter age	Inclination	Forest/ Diversified forest/non forest	Surface right/non surface right	Purpose of bore holes

17. At the end of the table cumulative number of proposed BH in forest area, non-forest area, diverted forest area, Surface right area and non -surface right area to be given.
18. Page-25, the lease area explored under different category of UNFC norms as shown in table is incorrect and should be recalculated as per the provision of Minerals (Evidence of Mineral Contents) Rules, 2015. The justification for area considered for G1/G2/G3 etc. are to be furnished as per the provision of MEMC Rules'2015.
19. In the Geological plan, the boundary of UPL has not been marked correctly. In the Geological plan and sections, the UPL should be drawn properly considering the mineralization over the lease area. The UNFC boundary/code has not furnished as per provision of MEMC Rules'2015.
20. Page-29, the method of reserve/resource estimation may be further elaborated and justified w.r.t recovery factor, Bulk density, Length of influence, nos. cross sections and bore holes considered in reserve and resource estimation. Necessary supporting documents to be furnished with respect to bulk density and recovery factor.
21. Page-30, Para-(ii), as mentioned under heading geological indicated resources and mineable probable reserves in proposed scheme of mining, is not correct. It may be corrected.
22. The reserve and resources has not been furnished as per Minerals Evidence of Mineral Contents Rules 2015. In text page no.-33-24, reserve and resources as furnished are not matched with geological plan and sections. The section wise calculation of geological resources and reserve are not furnished. Resources furnished under 333 category is not justified. The occurrence of manganese ore is pockety in nature therefore continuity of ore as shown in sections are not justifiable in absence of close space drilling. Part of the resources is shown within UPL which is not correct. The UPL is not correctly drawn considering mineable reserve. In geological section surface profile not marked with litho units and ore profile is also not correctly marked and not matched with bore hole logs. Accordingly geological plan and sections should be revised and re-estimation of reserve and resources should be furnished with proper UNFC codes.
23. As per guideline of "IBM manual on appraisal of Mining Plan 2014" at least 10% of total samples to be analyzed in accordance to BIS and reports form NABL accredited/Government Laboratory.

MINING:

24. Page-38, existing method of mining has not been described in brief with reason of discontinuance of mining operation along with statutory clearances obtained.
25. The lease is declared lapse by State Govt. however the present status of lease and set aside order passed by State Govt. should be furnished with documentary evidence.
26. The descriptions of the existing pits/waste dumps/Mineral rejects have not been furnished. All these information is to be furnished in the following table. Their nomenclature should be also reflected in relevant plans and sections.

Existing Pits:

Block/ Pit	Location (Grid)		Size of Pit (in m)		Surface area covered (in Ha)	Top RL (m)	Bottom RL (m)	No of benches	
			Length	Breadth				Ore	OB
	Northing	Easting							

Existing Waste Dumps/Mineral reject dumps/stacks:

Name of the waste dump/ mineral reject dump	Location (Grid)		Top RL (in m)	Bottom RL (in m)	No of terrace	Area Occupied (in Ha)
	Northing	Easting				

27. Year wise development and production plan should be furnished in the following tabulated format.

Particular for the year...	
Bench Geometry	Height (in m)
	Width (in m)
	Individual bench slope angle
Quarry Development	Location (Quarry Name)
	Extent of Development (coordinates)
	Sections considered for development
	Number of benches
	Benches considered for development with RL
	Top RL
	Bottom RL
	Direction of advancement
	Dimension of the quarry at the end of the year including existing benches
	Area occupied (in sq.m)
	Overall quarry slope angle
	Production of Ore (in MT)
	Generation of Mineral rejects ore from quarry (in MT)
Production of ROM (Ore + Mineral Reject) in MT	
Total Generation of waste (in cum)	

28. Page-40, in insitu tentative excavation, the stripping ratio is not correctly furnished. The recovery factor and cut-off grade should be furnished with proper justification. Table of insitu tentative excavation should be furnished in both i.e in cu.m and in tones. Necessary supporting documents to be furnished with respect to bulk density and recovery factor.
29. The year wise tentative excavation is not matched with development plan and sections. The cross-sectional area considered should be re-checked. The calculation of insitu tentative excavation should be revised based on the revised UPL as suggested in geology chapter.
30. In text, during 2021-22 no development is proposed. However as per development plan and sections it is observed that excavation of OB/waste has been proposed. It may be rechecked and corrected accordingly.

31. Page no.-43, briefly describe the layout of mine workings, pit road layout, the layout of faces and sites for disposal of overburden/waste along with ground preparation prior to disposal of waste, reject etc.
32. Conceptual mine planning is to be discussed up to the end of lease period taking into consideration the available reserves/resources, describing the excavation, recovery of ROM, disposal of waste, backfilling of voids, reclamation and rehabilitation.
33. In pursuant to the order dated 14.01.2020 passed by MoM, Gol, consequent up on the order dated 08.01.2020 of the Hon'ble Apex Court passed in W.P.(C) No. 114/2014, the lessee shall carryout "re-grassing in mining area after closure of mines". Accordingly it should be discussed during conceptual period

STACKING OF MINERAL REJECT /SUB GRADE MATERIAL AND DISPOSAL OF WASTE:

34. It is observed that one of the existing dumps are lying within UPL. Therefore their re-handling/shifting proposal should be furnished. It should be ensured that the area proposed for dumping should be proved non mineralized. Therefore exploration proposal priorities accordingly.
35. The proposed location of mineral reject should be furnished with terraces to minimize the land degradation. The dumps should be proposed outside the UPL.
36. Details of proposed retaining wall, garland drain, settling tank etc. to be given year wise with their location. Location of sub-grade storage along with year to year development of the SG dumps to be given.
37. The proposal of dumping may be given in tabulate format as shown below. The year wise build up of dump should be described in details.

year	Waste to be dumped	Dump No	Location of Dumping (Grid)	Proposed area	Proposed dumping RL	No of terrace proposed	Individual terrace height	Slope of the terrace

PROGRESSIVE MINE CLOSURE PLAN:

38. Page-76, Para-8.1, the baseline information should be described properly incorporating buffer zone of the lease area.
39. Monitoring station of air, noise and water should be described in text and their locations furnished in tabular form. Updated air, water, noise, ground vibration and soil data with analysis from laboratory done at specified periodicity to be enclosed.
40. Human settlement has not been furnished with population distribution pattern around mines area, male female ratio, literacy etc.
41. Year wise plantation covering number of saplings to be planted, location and area covered may be furnished. Matured area of backfilling and dump slope should be stabilized with plantation.

PRE FEASIBILITY REPORT:

42. The content of feasibility/pre-feasibility report and analysis of economic viability of the project is not described in detailed as per rule 16 and Part-V of MEMC Rule 2015. The economic viability of the project should be supported with NPV, IRR, Payback period by cash flow chart with cost involved in environmental and others protective measures and clearances, operational cost, administrative cost, infrastructure, royalty, NMET, DMF, closure cost etc.

PLATES (GENERAL):

43. All plans and sections shall show a scale of the plan at least twenty five centimeters long and suitably subdivided. The plans and sections submitted should bear the certificate that - the plans and sections are prepared based on the lease map authenticated by the state government.
44. Wind direction may show through wind rose diagram in key plan and environmental plan. The CCOM circular no.2/2010 and its addendum should be implemented. Magnetic Meridian and date of observation of should be given on all relevant plans. The ML boundary should

- be shown in standard symbol in red color. DGPS plan as submitted is not authenticated by competent authority. Also lease area not furnished in DGPS plan. KML file of existing quarry/waste dump/land use are to be submitted. Surrender area should be demarcated properly with different color hatching. Surface right area is not marked correctly.
45. Authenticated lease plan has not been submitted. In Key plan Minimum two grids should be furnished to trace proper location of the lease area. Approach road has not been shown in key plan. The key plan should incorporate all features as mentioned rule 32 (5) (a) of MCDR 2017 and all features should be shown in index as well.
 46. Surface Plan: Safety zone not demarcated in surface plan. Boundary pillar as furnished in surface plan and other relevant plan are not matched with DGPS plan. Surface plan is to be prepared in reference to UTM grid. The Surface Plan should be prepared to satisfy the provision as laid down rule 32 (1) (a) of MCDR'2017.
 47. Geological Plan & Section: In every geological section grid should be shown. Dip & strike not shown in geological plan. UNFC boundaries of G1, G2.. explored area should be as per MEMC Rule 2015. In Geological section 11' litho information has not been furnished. Surface profile not shown with litho units. G2,G3 area not matched with sections in reference to geological plan. In geological sections the ore profiles are not correctly furnished according to bore hole data. All geological sections should be revised and reserve and resources should be modified accordingly. Reserve and resource in quarry-1 not Justified with geological section. Manganese ore as shown in different place in geo. Plan are not justified with exploration data.
 48. Development plan & Section: Development plan and sections are not match each other. Year wise bench RL is not furnished. The proposed and existing bench mRL to be shown clearly over year wise development plan and sections. Geological information (lithology) to be furnished on development plan and sections. Development plan and sections should be furnished in 1:1000 scale for clear understanding.
 49. Environment plan: Environment monitoring stations are not shown in environment plan. The environment plan has not been prepared as per the provision laid down in rule 32 (5) (b) of MCDR'2017.
 50. Financial Assurance Area Plan: Financial assurance table should be given in FA plan. Land degradation due to mining and allied activity at the end of plan period may be shown separately on this plan with highlighted boundaries and different color codes for FA calculation.