



भारत सरकार GOVERNMENT OF INDIA  
खान मंत्रालय MINISTRY OF MINES  
भारतीय खान ब्यूरो INDIAN BUREAU OF MINES  
क्षेत्रीय खान नियंत्रक के कार्यालय  
OFFICE OF THE REGIONAL CONTROLLER OF MINES



Phone: 0674-2352463;  
TeleFax: 0674-2352490;  
eMail:  
ro.bhubaneshwar@ibm.gov.in  
Plot No.149, Pokhariput  
BHUBANESWAR-751020

No MP/OTFM/04-ORI/BHU/2018-19

दिनांक / Date: 16.04.2018

To

✓ Shri Antaryami Mishra, Lessee,  
Rarbahal Graphite Ore Deposit Mine,  
At-Thikdarpada, Post/Dist-Balangir,  
Odisha-767001.

Sub: Approval of of Mining Plan of Rarbahal Graphite Ore Deposit Mine over an area of 20.675 ha in Balangir district of Odisha of Shri Antaryami Mishra submitted under Rule-15 (1) of of Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016.

Ref: - i) Your letter no. nil dated 28.03.2018 received on 03.04.2018.

ii) This office letter of even no. dated 03.04.2018.

iii) This office letter of even no. dated 03.04.2018 addressed to the Director of Mines, Govt. of Odisha, copy endorsed to you.

Sir,

This has reference to the letters cited above on the subject. The draft Mining Plan along with Progressive Mine Closure Plan has been examined in this office based on site inspection carried out on 12.04.2018 by Shri Sudip Ranjan Mazumdar, Senior Mining Geologist. The deficiencies observed are enclosed herewith as Annexure-I.

You are advised to carry out the necessary modifications in the draft Mining Plan in the light of the contents vide Annexure-I and submit **three (3) firm bound and two (2) soft copies of the document text in CD in a single MS Word file (the drawing/plates should be submitted in Auto CAD compatible format and JPG format in resolution of 100x100 pixels on same CD)** within 15 (fifteen) days from the date of issue of this letter for further necessary action. If the total page of annexures exceeds 50 (Fifty) then it should be submitted as separate volume. But reference of these annexures must appear in the Mining Plan.

The para-wise clarifications and the manner in which the deficiencies are attended should invariably be given while forwarding the modified copies of the Mining Plan. It may be noted that no extension of time in this regard will be entertained and the Mining Plan will be considered for rejection if not submitted within above due date. It may also be noted that if the deficiencies are not attended completely, the submission would be liable for rejection without further correspondence.

भवदीय / yours faithfully,

(HARKESH MEENA)

क्षेत्रीय खान नियंत्रक / Regional Controller of Mines

**Scrutiny comments on examination of Mining Plan with PMCP of Rarbahal Graphite Mine over an area of 20.675 Ha in Bolangir District of Odisha State of Sri Antaryami Mishra, Lessee**

**General:**

- I. On cover page lessee's e-mail, Phone number, Mobile number, and Fax no. should also be furnished. Category of the mine should be specified. Content of cover page should comply all the requirements as mentioned in IBM Appraisal of MP 2014.
- II. All the annexure and text to be properly indexed/ numbered/ paged and signed by qualified person. All the certificates/annexures should bear dated signature.
- III. Sequence of para 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. The format of the tables should be same as mentioned in IBM Manual appraisal MP 2014.
- IV. The CCOM circular no.2/2010 and its addendum should be implemented.
- V. The term "subgrade" should be replaced with "Mineral Reject" in all places the document.

**Introduction**

- I. The introduction chapter to be further elaborated w.r.t grant of Mining Lease under reference to section 10 A 2 (B) OF MMDR ACT, 2015. Also, as mentioned the geological prospecting report recommended by UNFC committee referred as Annexure II is incorrect as the Annexure II attached to the document is scheme of prospecting. Necessary corrections should be done.
- II. The list of statutory clearances obtained or to be obtained along with rule reference should be mentioned in tabulated format.

**Chapter 1:**

- I. In page 1, para 1.a, Phone \_\_\_\_\_ Fax \_\_\_\_\_ Mobile No. \_\_\_\_\_ Email id \_\_\_\_\_ should also be mentioned. Information in Para 1 (d), 1 (e) & 1 (f) should be provided as per IBM Appraisal for MP, 2014.

**Chapter 2: Location and Accessibility**

- I. In page no 1, para 2 (a), Phone \_\_\_ Fax \_\_\_ Mobile No. \_\_\_ Email id \_\_\_ should be mentioned.

**Chapter 4: Geology and Exploration**

- I. In page 8, para e (ii), the details of already drilled bore holes indicating drilling type (Core/RC/DTH), Coordinates, Bore Hole numbers, Borehole diameter, spacing, inclination, collar RL, bore hole closing depth etc. should be given in tabulated format. The information on grid interval of already drilled boreholes is incorrect, instead the boreholes are at section interval and correct section interval should be mentioned. The header line of the table no.6 in page 9 to be corrected. Necessary corrections to be done.
- II. In page no. 10-11, para i, the future exploration program to be revised incorporating the followings.
  - (a) The reference of grid interval mentioned is incorrect. To be modified.
  - (b) The boreholes at 100 m grid interval along the section lines should be proposed to intersect ore zones at depth. Few check boreholes should be proposed adjacent to already drilled boreholes. The depth of the proposed boreholes should be justified enough to intersect ore zone in depth.
  - (c) The priority of drilling to be given in the area proposed for development for the first five years and the area proposed for overburden dumping to prove for non-mineralization before commencement of overburden dumping.
  - (d) The proposal for drilling under revised future exploration program should be furnished in tabular format indicating year of drilling, proposed borehole numbers, number of boreholes, section line, proposed borehole coordinates, proposed closing depth, type of drilling (Core Drilling), inclination etc. The information on the exploration proposal has to be furnished in following tables

Year	No of Boreholes	Grid Interval	Total Meterage	No. of Pits, dimensions and volume	No. of Trenches, dimensions and volume

The details of the proposed boreholes have to be furnished in following tabular format.

Year	BH No	Northing	Easting	Collar RL	Core/RC/DTH	Meteage	Inclination	Forest/Non-Forest/diverted Forest area	Surface Right/Non-Surface area	Purpose of BH
------	-------	----------	---------	-----------	-------------	---------	-------------	--	--------------------------------	---------------

(e) 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. Accordingly, the proposal should be given under future exploration programme.

III. The details of total lease area explored under UNFC have to be furnished in the tabular format provided below.

Total Lease Area: ..... Ha							Remarks/ comments including reasons for not carrying out the exploration as per UNFC norms
Item of Information	Lease area explored as per UNFC norms (in Ha) as on dt.....						
	Total lease area = A+B+C+D+E						
	G1 Level  A	G2 Level  B	G3 Level  C	Explored and found non-mineralized with level of exploration (Remarks)  D	Un- explored lease area  E	F	
Area as per level of exploration							
Reserve estimated after above exploration as on dated: .....							
Remaining Resource after above exploration as on dated: .....							
Total Reserve / Resource after above exploration as on dated:.....							

- IV. In page 12, the threshold value considered @3% is incorrect, instead the threshold value for flaky variety of Graphite is 2% Fixed Carbon (min). Necessary corrections to be made in text, calculation & tables etc.
- V. The justification of UNFC axes as mentioned from page 12-14 need to be modified as per MEMC Rules, 2015 and also considering the necessary statutory clearances to be obtained.
- VI. The UNFC boundaries as per the present status of exploration under MEMC rules 2015 should be demarcated over the Geological Plan and Sections.
- VII. The resources and reserves should be calculated as per the provision of MEMC Rules, 2015.
- VIII. In page 15, table 10, the remarks column should be deleted.
- IX. In page 15, table 11, Instead of area in ha, Grade should be mentioned under different level of UNFC resources.
- X. In age 16, table no 12 should be as per format specified in IBM appraisal of MP 2014.

## Chapter 2: MINING

- I. Method of mining as per category of mines w.r.t deployment of heavy mining machinery for deep hole drilling, excavation, loading and transport etc. should be described elaborately.
- II. In page 19-20, the tables have to be corrected. Considering the section interval the length of influence should not be more than 60 m. Hence, necessary corrections have to be done at all places of the document.
- III. In page 21, the top soil generation shown as "NIL" is incorrect. There is top soil in the lease area and also described in geology of the area and recorded in borehole log. Hence, necessary correction to be made with respect to generation, storage, utilization etc. of top soil. Also, the format of the table should be kept same as per IBM appraisal of MP 2014. The quantity of ore in tonnes should be shown in separate table.
- IV. In page 40, para b (i), the Insitu Tentative Excavation figs should be furnished in following format in both Cubic meter and in tonnes.
- V. In Refer page no. 22 to 24, the tables showing the development proposals should also incorporate the following additional information.
  - (1) Location of development in UTM coordinates at the end of year ,
  - (2) Top bench RL at the end of each year.
  - (3) Benches considered for development with RL

- (4) Direction of development of benches in Pit
- (5) Dimension of the Pit at the end of the year (Length x Breadth x Depth) to be furnished in tabulated format.

The total ROM quantity in tones should be furnished in all the summary tables.

- VI. The development proposal of 3m Height and 3 m width of benches contradicts with the statement of developing benches of 1.5 height and 2m wide as mentioned in page 24, para d. The necessary corrections should be made in all places of the document.
- VII. In page 24, para e, the statement “benches of different height will be developed ‘ is not correct and not permissible. It has been proposed to stack subgrade generation in the western side of the quarry but there is no mineral reject generation proposed in table no.17. Necessary correction to be made in tables,, text and calculations at all relevant places in the document.
- VIII. In page 24, para e, the layout of mine workings should also include the following parameters (1) Bottom RL (2) Total No of Benches (3). Bench Height and (4) Bench Width. Accordingly, necessary information in tabulated format may be provided for mine workings. The layout of faces to be shown in the following tabulated format.

Name of Pit	Description	1st Year	2nd year	3rd year	4th Year	5th Year
	Face RL					
	Length of Face					
	Direction of advancement					
	Length of advancement					

- IX. In page 24, the sites for disposal of overburden/waste along with ground preparation prior to disposal of waste, reject etc. has not been mentioned. The information on proving the area for barrenness (devoid of ore through exploration) should be properly described. Necessary correction to be made.
- X. Justification for site selection for first five year mining may be furnished. As discussed in the field the area for development should be revised. Necessary corrections to be made in all relevant text, plates etc.
- XI. Handling of ROM produced from the mine to be dealt properly till its end use.
- XII. Stripping ratio to be rechecked.
- XIII. In page 27,35 &36, table 26,32,33 &34, is incorrect with respect to “area under mining at the start of mining period”. Necessary correction to be done in the table and at all places of the document.

### Chapter 3: Mine Drainage

- I. Mine drainage to be updated with depth of water table encountered in pit and nearby borewells.

### Chapter 4: STACKING OF MINERAL REJECT/SUB GRADE AND DISPOSAL OF WASTE:

- I. In page no.28, the nature and quantity of top soil and mineral reject to be disposed off to be described along description of with overburden / waste. The information on top soil and mineral rejects to be provided in following format. The term subgrade to be replaced by mineral reject and same should be updated in table no.17 and stripping ratio should be corrected accordingly. Necessary corrections to be done at all relevant places in the document.

Year	Top Soil (cum)		Overburden		Mineral Rejects	
	Reuse/spreading	Storage	Backfilling	Storage	Blending	Beneficiation

- II. In page 29, para b, the proposed dumping ground within the lease area be proved for presence or absence of mineral and be outside the UPL. The area proposed for overburden dumping shall be proved for its non-mineralization through exploration. Accordingly, the priority of drilling has to be proposed so that the area

is proved to be barren before overburden dumping. The same should also be described under the paragraph. Necessary modification to be done in the text accordingly.

- III. In page 63, para c, the proposal for dumping may be given in tabulated format as shown below: Further, 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, dump slope, individual terrace height and slope with description of method & manner of disposal of waste should be mentioned. The year wise buildup of dump should be described. Table 29 to be modified as per the format tabulated below.

Year	Total waste to be dumped (in m3)	Location of disposal	Average height of the dump (in m)	Area to be dumped (in m2)	Top RL	No of terrace	Terrace height	Slope of the terrace

- IV. In page 30, the table showing the year wise construction of retaining wall, garland drain and settling tank should have specific proposal up to 5th year. Details of year wise proposal for construction of retaining wall, garland drain, settling tank etc. to be given with their location. The length of the retaining wall proposed for construction is also insufficient. Number of settling pond proposed for construction should be specified with their location. Necessary modifications to be made.

#### Chapter 6: PROCESSING OF ROM AND MINERAL REJECTS

- I. In page 33, in para e, the process of manual segregation, sorting, sizing/size reduction etc. should be thoroughly described and preferably through flowchart.

#### Chapter 7: OTHERS

- I. In page 34, para 7 (b), the employment potential of management and supervisory personnel should be properly described and key statutory positions to be fulfilled should be mentioned.

#### Chapter 8: PROGRESSIVE MINE CLOSURE PLAN

- I. The table showing year wise proposal of plantation should be shown including the information on location of plantation.
- II. In page 36-37, monitoring of air, water and noise with frequency of monitoring should be specified. Necessary corrections to be done at relevant places.
- III. The "SUMMARY OF YEARWISE PROPOSAL FOR PROGRESSIVE RECLAMATION PLAN" has not been submitted. The same should be mentioned in the document.
- IV. The provisions of sub-rule (1) of Rule 27 of MCDR 2017 shall not be applicable for a mining lease granted through the auction or the mining lease granted under the provisions of clause (b) or clause (c) of sub-section (2) of section 10A, wherein the Mine Development and Production Agreement has been signed between the lessee and the State Government. Accordingly, necessary correction should be made in the document and at all relevant places.

#### ANNEXURES

- i) The "Mine development and production agreement" with the state government should be enclosed with the document.
- ii) Few photographs showing Land use of the lease area/applied area, environmental status of the area should be enclosed.
- iii) Photo Identity Card of Lessee with permanent address proof duly signed by lessee should be enclosed.
- iv) The details of the boreholes drilled should be submitted in Form -J of MCDR, 2017.
- v) Geological Prospecting report along with plans and sections authenticated by state government should be enclosed with the document.
- vi) Prefeasibility report should be enclosed with the document instead of feasibility report.

**PLATES (General):**

- i) Show a scale of the plan at least twenty-five centimeters long and suitably sub-divided;
- ii) The conventions provided under the Metalliferous Mines Regulations, 1961, shall be used in preparing all plans and sections
- iii) All plans and sections should comply with the provisions of Rule 32 of MCDR 2017.
- iv) 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.
- v) All plans and sections should be signed with date by Qualified Person.
- vi) Along with local grid coordinates, UTM coordinates should also be provided in the grid lines and latitude/longitude coordinates should be mentioned adjacent to boundary pillars in all plans and sections.
- vii) The UPL has to be redrawn based on provision of UNFC boundaries as per MEMC Rules 2015 and should be shown in red color in all relevant plans and sections.
- viii) The proposed bench mRL to be mentioned in the all plans and sections.
- ix) Date of survey should be given on plan and sections and the same should be signed with date.
- x) Grid Lines to be shown in all sections - Geological Sections, Development Sections, Conceptual sections, Dump sections etc.
- xi) The lithology should be shown in all relevant sections.

**Key Plan:**

- i) The adjoining area lying preferably within five kilometers should be shown in key plan.
- ii) Predominant wind direction may be shown with Wind rose diagram in key plan.
- iii) Approach road to lease area should be shown in key plan.
- iv) The provisions of Rule 32 (5a) of MCDR 2017 should be complied.

**Surface Plan:**

- i) Few pillars may be correlated with some permanent ground features giving distance and bearing/direction.
- ii) The surface plan should be updated with existing surface features/pits etc. as discussed in field.
- iii) The dimension of pit 1 should updated as per current field position.
- iv) Top and bottom RL of Pits shown in Surface Plan should be mentioned.
- v) UTM coordinates to be mentioned along with local coordinates along the grid lines.
- vi) The coordinates of the boundary pillar in UTM and lat/long should also be provided in tabulated format.
- vii) The UPL as shown in the index has not been marked over the plan.
- viii) Safety zone demarcation line should be shown in index.

**Geological Plan & Section:**

- i) Dip and Strike to be shown in Geological Plan
- ii) Accordingly, the Geological plan and sections should be revised and updated with proposed boreholes.
- iii) The year wise proposal for drilling to be shown in different contrasting color in both Geological Plan and Geological sections. The Proposed boreholes to be plotted in Geological section showing their proposed borehole Number, Collar RL and estimated closing depth at the end of borehole. The borehole to be plotted in dashed line. The color of the boreholes proposed in Geological plan should match with the plotted proposed boreholes in Geological sections.
- iv) In geological plan, the UTM coordinates should be mentioned along with local coordinates along the grid lines.
- v) UNFC boundaries should be drawn in Geological Plan and sections as per provision of MEMC Rules, 2015. UNFC codes should be mentioned in Geological sections.
- vi) All the lithology within and outside the UPL to be shown in the Geological sections. Necessary corrections to be done in all the sections.
- vii) In the Geological Plan UNFC boundaries, UNFC codes, explored area, unexplored area, forest area, non-forest area should be shown in contrasting colors.
- viii) The proposed boreholes to be plotted in dotted lines in Geological sections along with Collar Id, RL and proposed closing depth at the bottom of the borehole.
- ix) The year wise proposal for drilling to be shown in different contrasting color in both Geological Plan and Geological sections. The year wise color of the boreholes proposed in Geological plan should match with the plotted proposed boreholes in Geological sections.
- x) The index of Geological features should be same in both Geological Plan and Geological sections.
- xi) In Geological Plan, cross section lines and longitudinal section line to be shown. A longitudinal section of the lease area should be shown.
- xii) The X and Y axis should be properly defined in sections. Grid lines should be shown in sections.

**Development plan & Section:**

- i) Ore stacking and sorting site as mentioned in page 17, para 2 (a) should be shown in the development plan.
- ii) The "composite development plan" should be submitted.
- iii) The location of the development should be changed as per the discussion in field.
- iv) Quarry name, proposed waste dump, mineral stack yard etc. to be shown in the development plans.
- v) The lithology of the area should be clearly shown in year wise development plan and sections in the area proposed for development.
- vi) Each year development proposal for different blocks should be shown separately in different color. The UPL may be redefined and benching pattern to be made in all development plans and sections. The UPL should be shown in Red colour which should contrast to the year wise development proposal color shown in development plan and sections.
- vii) The RL of the benches should be clearly shown in year wise development plan and sections.
- viii) Separate dump plan and sections with RL should be submitted separately at a larger scale.
- ix) The term "subgrade stack yard" should not be used. Instead the term "Mineral rejects" should be used, if any.
- x) In the development sections the UNFC codes should be mentioned instead of G1/G2 etc.
- xi) Year wise development plan and sections should show the entire lease boundary along with section numbers mentioned in the plan.
- xii) Retaining wall, garland drain etc should be shown in development plan.

**Dump plan & section:**

- i) The year wise buildup of dump should be shown in section with RL. The index of the dump section should be properly shown showing the year wise buildup proposal.
- ii) The grid coordinates should be shown in the X-axis of the dump section.

**Environment plan:**

- i) The Environment Plan as prepared should be satisfy the provision as laid down rule 32(5) (b) of MCDR2017.
- ii) The adjoining area within 60m of boundary of the lease area to be plotted. The particulars with regard to items (ii), (iv) and (v) of Rule 32(5) (b) shall be applicable only up to sixty meters beyond the boundary of lease area. The same should be demarcated in Environment plan. The adjoining area within 500 m of boundary of the lease area is not properly demarcated. The same should be corrected. The information on adjacent mine as available may be shown within the 500m of boundary of the lease area.
- iii) The contour values at 5m interval are not prominent. Necessary corrections to be made.
- iv) The proposed environment protective measures to be shown in environment plan. The drainage pattern of the lease area also to be shown on the plan.
- v) Air, water and noise monitoring stations to be shown in the plan.
- vi) Predominant wind direction may be shown with Wind rose diagram in key plan.

**Reclamation Plan:**

- i. Reclamation Plan has not been submitted. Reclamation plan should be prepared as per guidelines mentioned in point no 8.3.1 of PMCP as mentioned in proposed universal format for mining plan /scheme of mining including progressive mine closure plan.
- ii. Year wise progress of dumping, afforestation using different colour codes for easy understanding may be shown.

**Conceptual plan:**

- i. Conceptual plan and section should be prepared up to the end of lease period taking into consideration the present available reserves and resources describing the excavation, recovery of ROM, Disposal of waste, backfilling of voids, reclamation and rehabilitation etc. Conceptual plan may be revised with revision in development plan. Hence, necessary correction should be done in conceptual plan and section.
- ii. Conceptual plan may be prepared considering the direct evidence of host rock. One longitudinal section may also be submitted. Direction of run off from the area based on surface contours may be shown on the plan and the sections.