REPORT ON CHECK INSPECTION OF KENDADIH COPPER MINE OF LESSEE M/S HCL IN VILLAGE-KENDADIH, DISTRICT-EAST SINGHBHUM

Name and designation of inspecting officer : Shri Anupam Nandi (Regional Controller of Mines Ranchi)

Date of Inspection : 06.02.2020

1. General information of the mine:

i) Name of mine : Kendadih copper Mine

ii) Owner : Hindustan Copper Limited

iii) Nominated Owner : Shri S.K Bandopadhyaya

iv) Mining Engineer : Shri S. Sampath Kumar

v) Agent : Shri Sanjay Kumar Singh

vi) Mine Manager : Shri S. Sampath Kumar

vii) Lease Area : 1139.60 Hectares

viii) Location : Village-Kendadih, District- Signhbhum (E)

ix) Lease Period : Up to 02.06.2023

x) Date of Expiry : 02.06.2023

xi) Date of approval of Mining Plan : 21.12.2017

xii) Date of approval of scheme : -

xiii) Period of Mining Plan : 01.04.2018 to 31.03.2020

Scheme of Mining : -

xiv) Production (Year 2018-19) : 25451 (in tons)

2. Brief description of the mine:

a. A brief description of the mine covering location, geology, problems associated with mining of the deposit etc. may be given.

Kendadih underground copper mine falls on Survey of India Toposheet- 73 J/6 and is located at Ghatsila subdivision of east Singbhum district of Jharkhand state in the Singbhum copper belt. It is at distance of about 15 km from Ghatsila Rly. Stn. and around 240 km from Kolkata and 50 km from Tatanagar.

Overall geology ie lithology, Structure, ore mineralization, ore control of Surda mines are as follows:

Kendadih Lease is located in the Singhbhum Copper Belt and mainly follows a Shear / Thrust Zone running from Surda Mine in the south to Jaduguda in the north. The stratigraphic sequence of this area is given below:-

Lithology:

Dominant schistosity trends and the strikes of the litho-units vary from ranges between 400 and 500m and the dominant structure plunges towards NE. It appears inspite of metamorphism a sort of gradational bedding is evident. The main litho-types are:-

Dhanjori Volcanics: The basic volcanics are massive to finely laminated flows but include pyroclastic also. It is inter layered with quartzite, arkose and phyllite. The principal minerals here – plagioclase (sodic) and Hornblende with minor amount of quartz, epidote, Zoisite etc.

Biotite schist: Chlorite bearing biotite schist constitutes common rock types in the North- East fringe of Dhanjori metabasites. The rock contains dark brown biotic, altered chlorite mainly and traces of quartz, tourmaline and magnetite.

Biotite-Chlorite–quartzite schist: This is the outcrop (200 m. wide) along shear zone Bulk of copper mineralization is found within litho-unit.

Mica-Schist and Phyllite: This is an important rock type of Chaibasa formation is found here. The quartzite band with schist-rock traces the structural pattern of the area.

Kyanite Quartz rock is the basal member of Chaibasa formation

Structure:

The general strike of the rocks in the area is NW-SE with dip varying from 200 to 600m towards NE. The thrust zone, with its NW-SE trend has its rock formations effected by tectonic movements, gives rise to plunging folds with axes in ESE –WNW direction developed within Shear Zone. The linear structure in this area is represented by (i) Pebble elongations, (ii) slickenside (iii) Parallel alignment of mineral grains, and (iv) axes of micro folds, the lineation normally pitching 450 to 500 toward N 500E.

Copper mineralization:

The ore bodies in the area are primarily copper lodes with dominate chalcopyrite, pyrite and subordinate pyrrhotite and a large number of minor and trace minerals which are mostly sulphide's, arsenide's and telluride's of nickel, cobalt, molybdenum. Bismuth, uranium, precious metals etc. The copper mineralization is in the form of disseminations in the granular quartz-chlorite schist to give fairly uniform low grade wide ore zones with remarkable persistence along strike and dip. Within this wide zone, stringers and veins are found within biotite-chlorite schist's. Thin, rich massive sulphide zones are confined in to brecciated quartz veins. Very sporadic replacement patches are noticed. Thus, the ore is essentially of the dissemination and cavity filling type. The ore zones are exposed on the surface in the form of leached outcrops and gossans with indigenous limonite with gangue minerals. Since the total sulphide ore minerals are small in proportion, the resultant gossan zones are not conspicuous. The copper lodes have been delineated in borehole cores and in the mines on the basis of the assay data. The lodes are mostly sheeted zones with branches and interlocks of sulphides.

Ore mineralogy:

Chalcopyrite is the most pre-dominant sulphide mineral followed, in order of abundance, by pyrite and pyrrhotite. Important amongst oxide minerals are apatite, magnetite and uranium mineral. Gold and silver occurs in minor quantities. The sulphides occur commonly as massive, veins, stringers along foliation and fracture planes, as disseminations and as minor replacement patches and veins.

Mineralisation and alteration:

Intense shearing may be observed in the shear zone rocks. Shearing accompanied by silicification, feldspathisation, tourmalinisation and other metasomatic activities have resulted in alteration of the adjoining rock units to biotite chlorite quartz schists and to granular quartz biotite (tourmaline-magnetite) rocks with disseminated copper ores. Vein lets and stringers of chalcopyrite may be noted as filling within the fractures and also along the foliations in the chlorite/ biotite quartz schist. The fracture filling type of ores may be observed in the conglomeratic quartzites.

Zone of oxidation:

The zone of oxidation extends over the entire strike length of the area. The depth of oxidation varies 20 to 35m from the surface level. The lower limit of the zone of oxidation follows the topographic profile and there are no abrupt changes.

Zone of secondary enrichment:

The primary sulphides appear just below the zone of oxidation without a zone of secondary enrichment which is practically absent in the area. The sulphide minerals in the oxidized zone are invariably leached, leaving iron-hydroxide as a residue. These leached outcrops on the surface indicate the presence of sulphide mineralization at depth. Some of these leached outcrops exhibit limonitisation with shades of brown, grey and purple colours.

Paragenesis:

The paragenetic sequence of the ore minerals has been worked out on the basis of mutual textural and replacement relationship. In the ascending order of appearance it is limonite, chromite, pyrite, pyrrhotite, molybdenite, uraninite, nicolite, arsenopyrite, chalcopyrite, tetradymite and melonite.

b. Description on deployment of mining machinery may be given in the following format.

b) Deployment of mining machinery:

Departmental

Sl No	Machineries deployed	Capacity	Number of Units	In use	Brief description	Remarks
1	Double drum winder		01	02	Ore hoisting/men winding	
2	Single Drum hoist		02	02	Ore hoisting winding	
3	Main ventilation fan		02	04	For mine ventilation	
4	Compressor		04	03	To provide air underground and surface machines	

Contractual

Sl No	Machineries deployed	Capacity	Number of Units	In use	Brief description	Remarks
1	Jack Hammer with air legs		25	25	For development face drilling	
2	DTH for drilling pilot holes for stopes and pilot raises		01	01	To use in large dia drilling	
3	Rocker Shovel		15	15	Mucking and Loading	
4	Cavo/ hopper loader –2		02	02	Mucking and Loading	
5	Scraper		05	05	Scrapper shall be used for ore extraction.	
6	Battery locomotives		05	01	Use in UG for ore transportation	
7	UG pumps		03	03	Underground de-watering purpose	
8	Side tipping Mine car		45	45		

3. Implementation of Mining Plan or scheme of Mining:

Sr. No.	Proposal in the approved Mining Plan or Scheme of mining (Period from 2018-19 to 2019-20)	Observations regarding implementation of proposals given in approved Mining Plan Or Scheme of mining.	Remarks
1.	**CONSERVATION OF MINERALS**		
a)	Exploration:	a) No exploration has taken place	
b)	Utilization of subgrade mineral:	b) NIL	
c)	Any other proposal for monitoring:	NA	
2.	**SCIENTIFIC MINING**		
a)	Mine Development and method of mining	Mining method of work, is **Room & pillar** as suited to the narrow width of ore-body of Kendadih. As the width of the ore body is 1.5 to 4.0m mostly, hence the most suitable method of mining is Room & Pillar method. However, if the lode width is found to be higher during the course of mining, Horizontal cut & fill (HCF) method may be applied. Currently only development work is going on Development faces: 3L/1220N/DN, 3L/510N/DS, 4L/1040N/DN, 5L/70N FW/DN, 5L/990N/DN Raises:	

		3L/1100N, 3L/1260N, 4L/1028N, 4L/1460N, 5L/305N, 5L/174S	
b)	Handling of Waste/subgrade material:	660MT, Entire waste rock generated during mining is used for stowing underground.	
c)	Area reclamation & restoration:	0.125 Ha area Rehabilitaion done in year 2018-19	
d)	Any other proposal for monitoring:	NA	
3.	**PROTECTION OF ENVIRONMENT**		
a)	Afforestation:	80 Nos. trees planted in 2018-19 with survival rate of 40%	
b)	Quality of Air:	Within permissible limit	
c)	Quality of Water:	Within permissible limit	
d)	Noise Level:	Within permissible limit	
e)	Vibration:	Within permissible limit	
f)	Any other proposal for monitoring:	NA	

4. History of Violations after approval of Mining Plan or Scheme of Mining:

Sl.	Date of	Name of Inspecting	Violations of MCDR,88 observed	Rectification of	Remarks

No.	Inspection	Officer	andPointed out	Violations	
1.		Sh. G.s. Kannan, SMG (Examination of office record)	Rule 45(5)(b) issued on 01/01/2020	Complied on 14/02/2020	

5. Socio-Economic Development Plan: Total __ lakh spent for C S R activities during 2018-19.

Sl. No.	Proposed Action Plan towards Socio-Economic Development	Expenditure Proposed (In Rs. Lakh)	Expenditure Incurred (In Rs. Lakh)	Remarks
1.	General Development in the area			
	i) Housing	1.49	1.49	
	ii) Water Supply	9.57	9.57	
	iii) Sanitation	4.22	4.22	
	iv) Health, Safety and Medical Facilities	2.92	2.92	
2.	Education and Training	6.87	6.87	
3.	Employment to local inhabitants			
4.	Public Transportation and communication			
5.	Recreation and other sports activities	4.55	4.55	
6.	Expenditure for environment management	0.11	0.11	
7.	Other	3.04	3.04	
	Total:	32.77	32.77	

24/02/2020

(Anupam Nandi)
Regional Controller of Mines & Inspecting Officer