

# MINE PLANNING AND DESIGN

*(AFTER EXPLORATION IS DONE)*

By

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# What is difference between mine planning and design

- ▣ Planning is the primary step
- ▣ Designing is the secondary step
- ▣ What does planning consist of
  - Available resource planning
  - Production planning
  - Machine planning
  - Manpower planning
  - Closure planning

- ▣ Other areas that require planning are
  - Disaster management planning
  - Environmental planning
  - Material planning
  - Construction planning
  - And so on so on so on

# Types of planning

- ▣ Long term planning (*Generally for the life*)
- ▣ Medium range planning (*Generally 5 years*)
- ▣ Short term planning (*Yearly or monthly*)

# Inputs and out puts

- ▣ The inputs for mine planning
  - Material available for production
  - Demand of the mineral both quality and quantity
  - Legal needs for mines safety
  - Legal needs for mineral conservation
  - Legal needs for environmental protection

# Actual work during mine planning

- ▣ Borehole logging,
- ▣ Decision on slice (machine height)
- ▣ Drawing of slice plans and sections
- ▣ Computation of volumes and quality with slices and also sections.
- ▣ Compare volumes arrived from 'X' sections and CAL section taken on either side
- ▣ Form regression curves

# Outputs of mine planning

- ▣ Outputs of mine planning
  - Schedule of production
  - Recruitment plan phase wise
  - Safe operation
  - Rational conservation
  - Matching equipment life and mine life

# How is planning done?

## Step-1

- ▣ With the data available check the reserves for different cut-off grades
- ▣ If crusher is used check for AHD,
- ▣ Decide on the annual production Q&Q
- ▣ Decide on type of machinery needed
- ▣ Decide on the fleet sizes and matching
- ▣ Take care of IRR for the machine
- ▣ This completes the first step



## Step II

- ▣ Production data is input to step 2
- ▣ Do manpower planning,
- ▣ Follows machine maintenance planning
- ▣ Infrastructure planning
- ▣ Storage facilities
- ▣ Spare part planning
- ▣ DMP (Disaster Management plan)

# What is mine design?

- ▣ Designing consists of
  - Actual layout of roads,
  - Locations of access and egress
  - Location of crushing plant
  - Slope design,
  - Strata control in the case of UG mines
  - Ventilation design in the case of UG mines,
  - Drainage layout
  - Overall pit slope (Final pit slope)

# Practical problems in mine planning and design

- ▣ Incorrect input data like wrong quality
  - This occurs due to wrong core data record
  - Either lean or rich material will be stacked in one place geologically, making planning difficult
  - The stripping will be erratic (Neither reducing, nor increasing, nor constant)
  - Environmental restrictions and safety restrictions

# Practical utility of this class

- ▣ You can approximately check the correctness of the reserves and quality
- ▣ You can compare the design compatibility with the legal needs.
- ▣ You can check yourself whether the quantity and quality is compatible with slice quantity or not

ANY QUESTIONS?

THANK YOU