Mining Modeling 4

Evaluating Mining Project Expansion Options

Summary

This advanced modeling course deals with a common issue encountered by mining professionals: how to modify an existing model to incorporate a new potential expansion?

The course will also discuss how to evaluate the various size and timing options for the expanded capacity.

This session will cover design and flexibility concepts as well as various advanced Excel techniques.

Participants will be given an existing model of a mining project and asked to include an expansion of various sizes.

Prerequisites

This course builds on "Mining Modeling 1", so participants may want to complete that course prior to taking the "Mining Modeling 4" session.

Timing

This course requires 8 hours.

Learning Topics

1. Build Switches for Various Expansion Sizes
- ✓ Clearly organize expansion options into various cases:
  - – Include Capex, labour, ore inventory and downtime
  - – Show current and expanded capacity
- ✓ Include a switching mechanism to toggle expansion cases
- ✓ Use Conditional Formatting to show timing of expansion startup
- ✓ Permit the user to choose the year of expansion and the schedule/timing of Capex and incremental processing capacity

2. Incorporate Scenarios for Testing Key Drivers
- ✓ Create a matrix to test expansion sizes as well as key drivers
- ✓ Use Data Tables to populate the model for all permutations of expansion cases and economic scenarios

3. Modify All Relevant Schedules
- ✓ Adjust mine sequencing for expanded waste and ore volumes
- ✓ Add inventory schedule for ore and finished products:
  - – Highlight excess ore inventory
  - – Show periods where there is excess mill capacity
- ✓ Adjust cost schedule for changes due to expansion:
  - – Adjust mining costs due to changes in haulage distance
  - – Capitalized costs attributed to expansion
- ✓ Modify depletion schedule for capitalized costs
- ✓ Create schedule to value various types of inventory
- ✓ Adjust working capital schedule for inventory valuations

4. Value the Various Expansion Scenarios
- ✓ Show unlevered free cash flows for all expanded cases
- ✓ Determine the impact of expansion on the overall project
- ✓ Value expansion scenarios using NPV, IRR and payback period