



COLLABORATION INVESTIGATION

Clients: *Confidential*

Duration: 4 Months (2018)

Project Team:

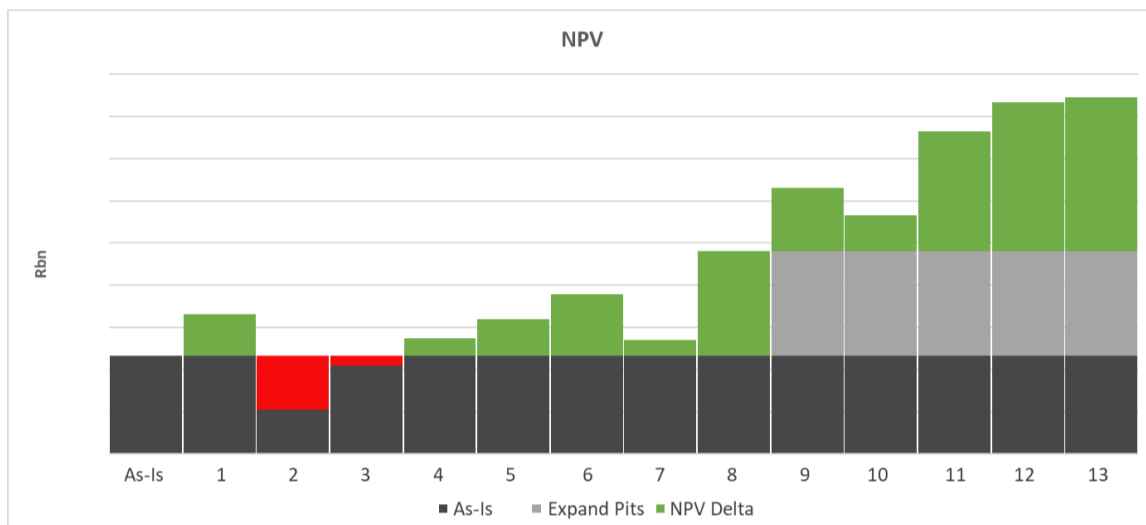


FIG 1: Incremental NPV per Collaboration Option when Combining Both Mines



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PROJECT LEAD



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TECHNICAL LEAD



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OPTIMISATION



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SCHEDULING



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FINANCIAL MODELLING

CLIENT NEED

Two neighbouring mines decided to investigate the potential of unlocked synergies as if operating as one mine.

APPROACH

VBKOM conducted the investigation with a techno-economic team and delivered 13 collaborative scenarios (shown in FIG 1). Each mine was baselined individually and then combined with an integrated mine schedule to form the Combined As-Is. Thereafter each Combined Option was compared to the Combined As-Is. Options were demonstrated in NPV terms and various other key metrics and supported by detailed mine scheduling and pit optimisation work.



VALUE DELIVERED AND RESULTS

Each Collaboration Option was detailed with the following results:

- > Production Animation of Life-of-Mine Schedule
- > NPV Sensitivities and Top Drivers
- > Discounted Cashflow Analysis and Unit Cost Breakdown
- > Capital Expenditure
- > Production Volumes, Resource Utilisation, Plant Yields
- > Grade-Tonnage Plot showing Incremental Value
- > Plant Yield Curves
- > Incremental NPV Value compared to Base Case

SCENARIOS

The following Collaboration Options were investigated:

- > **As-Is**: Combined and integrated for both mines to reflect a shared operation.
- > **Option 1**: Reclassify Mine A's waste as ROM feed for Mine B's low-grade plant.
- > **Option 2**: Send Mine B's high-grade ROM to Mine A for a yield benefit. Stockpiling applied.
- > **Option 3**: Swap both mine's medium-grade ROM and send to the other mine's plants.
- > **Option 4**: Adapt the mining sequence to optimize the waste stripping ratio.
- > **Option 5**: Lower Mine A's plant yield and spend capital to build a super low-grade plant.
- > **Option 6**: Best of both mines' unit costs are applied to both mines, i.e. efficiency sharing.
- > **Option 7**: Best options thus far combined.
- > **Option 8**: Spend capital to lift system constraints, i.e. increased plant and rail capacity.
- > **Option 9**: Expanded Whittle pits with existing plant capacity and a variable product portfolio mix.
- > **Option 10 & 11**: Expanded Whittle pits with upgrades to existing plant capacity and a variable product portfolio mix.
- > **Option 12**: Expanded Whittle pits with upgrades and expanded plant capacity.
- > **Option 13**: Expanded Whittle pits with upgrades and expanded plant capacity and a variable product portfolio mix.



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