



**SERVICE AND SUPPORT  
IN  
MINE & EQUIPEMENT  
PLANNING**



**Ulrich Mentges**  
Senior Mine Planning Engineer

“

Through precise mine planning, we unlock the full potential of each operation – maximizing efficiency, sustainability and value while paving the way for long-term customer success.

**30+** Years of Experience

**1993**

Diploma in Mining Engineering at RWTH Aachen University

**1995 – 1998**

Mining Engineer at SST Consulting GmbH

**1998 – 2022**

Senior Mining Engineer at thyssenkrupp Mining

**2022 – 2024**

Senior Mining Engineer at FLSmidth

**2026+**

Senior Mining Engineer / Head of Mine Planning at MCI



**Joel Bauer**  
Mine Planning Engineer

“

Each mine is unique – with tailored planning, we unlock site-specific potential and secure sustainable performance.

**9+** Years of Experience

**2017**

M.Sc. Mineral Resources Engineering (European Mining Course) RWTH Aachen, Aalto University Helsinki, TU Delft

**2017 – 2020**

Mining Engineer at Lhoist Germany

**2020 – 2021**

Site Manager at RPBL

**2021 – 2024**

Mine Planning Engineer at thyssenkrupp & FLS

**2026+**

Mine Planning Engineer at MCI

## Testing

- Soil & rock testing by
  - PLT (material hardness)
  - EDAT (abrasiveness)

## Studies

- Study reporting
- Final result presentation

## Financial modeling

- Cost estimations / calculations
- NPC / NPV
- Sensitivity and risk analysis



## Optimization

- Pit & equipment optimization
- Overland conveyor design
- Belt Analyst calculations

## Mine design & layout planning

- Mine design
- Mine scheduling
- System planning & consulting
- System comparisons

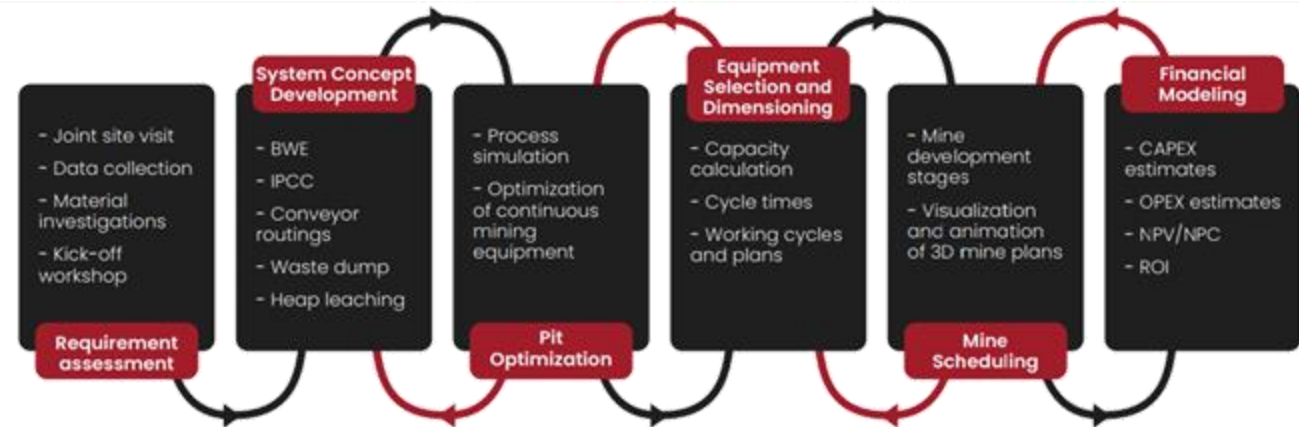
## Equipment selection

- Equipment budgetary concepts
- Equipment specifications
- Equipment dimensioning

# MINE PLANNING & DESIGN SERVICES

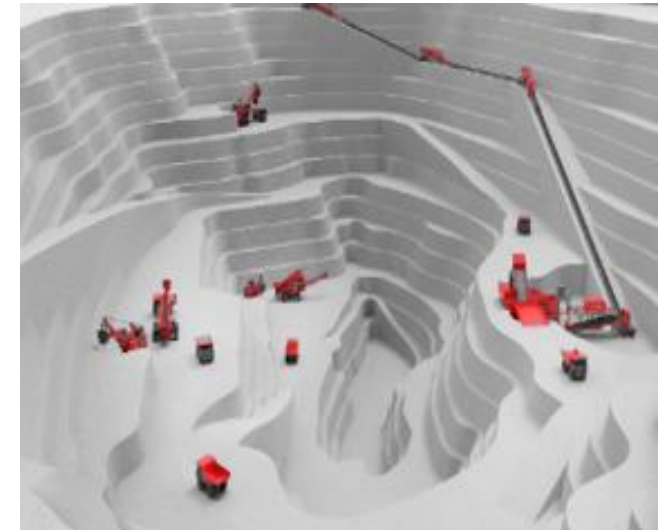
## Capabilities & Services

- **Application Engineering:** Tailored solutions with flexible cost and performance options, guiding decisions from concept to execution.
- **Mine Planning & Optimization:** Strategic support from feasibility studies to full system integration for efficient mining.
- **Feasibility Studies & Equipment Selection:** Detailed evaluations, customized equipment designs, and 3D visualizations.
- **Innovative Mining Systems:** Optimized conveyor-based solutions reduce truck reliance, improving efficiency and cutting costs.
- **Financial Modeling & Risk Analysis:** Precise CAPEX/OPEX with sensitivity analysis for robust financial planning.
- **Mine Scheduling:** Tailored schedules for continuous/discontinuous systems, ensuring alignment with mine design.



## Approach & Benefits





- **Collaborative Development:** Early-stage collaboration to assess CAPEX, OPEX, flexibility, and scheduling impacts.
- **Data-Driven Precision:** Extensive database and simulations for optimized equipment and layout planning.
- **End-to-End Support:** Comprehensive support across the mining lifecycle, from feasibility to operations.



# MINE PLANNING & DESIGN SERVICES

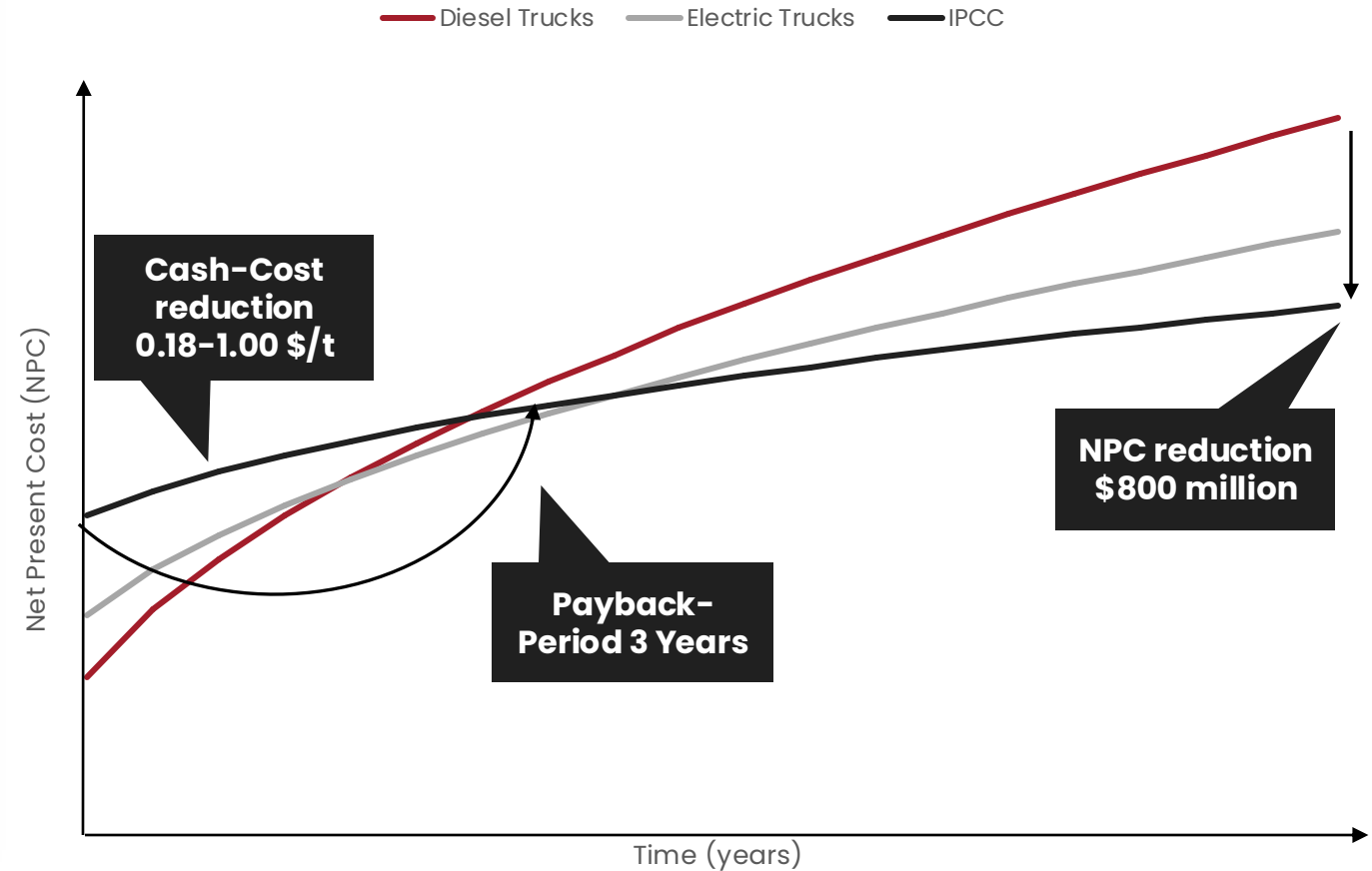


MCI Mine Planning team provides services for techno-economic studies during project development

| Project stage      | Conceptual study                                                                                                                                                                              |  |  | Pre-feasibility study                                                                                              |  |  | Early contractor involvement                                                                                       |  |  |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--------------------------------------------------------------------------------------------------------------------|--|--|--------------------------------------------------------------------------------------------------------------------|--|--|
| Concept            | Determine what it <b>could be</b>                                                                                                                                                             |  |  | Determine what it <b>should be</b>                                                                                 |  |  | Engineer what it <b>will be</b>                                                                                    |  |  |
| Objective          | Study to compare systems based on scenario analysis                                                                                                                                           |  |  | Engineering study to derive best system                                                                            |  |  | Engineering on how mine and equipment will look like                                                               |  |  |
| Accuracy/timeframe | +/- 25-40% (4-16 weeks)                                                                                                                                                                       |  |  | +/- 15-25% (3-6 month)                                                                                             |  |  | +/- 5-15% (4-9 months)                                                                                             |  |  |
| Methodology        | Concept screening & development<br>                                                                          |  |  | More detailed system design<br> |  |  | Optimization of best system<br> |  |  |
| MPL approach       | Mine Planning Team can provide services/deliverables to customer across the project development phase<br> |  |  |                                                                                                                    |  |  |                                                                                                                    |  |  |

## Exemplary Study for Comparison Diesel vs. Electric Trucks vs. IPCC

- **CAPEX:**  
Higher initial CAPEX pays back after 3 years
- **Cash-Costs reduction due to:**  
20-60 % less truck fleet requirement & Less haul road maintenance & workshop size
- **NPC improvement:**  
Net-Present-Cost reduction of up to \$800 mio at assumed 9 % discount rate & over life-of-mine
- **CO<sub>2</sub> reduction:**  
Reduction in on-site carbon emissions by up to 50 % depending on power source





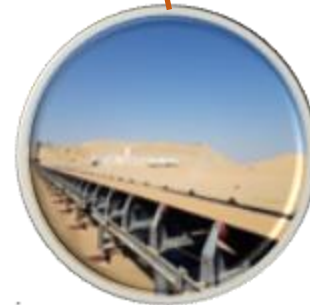
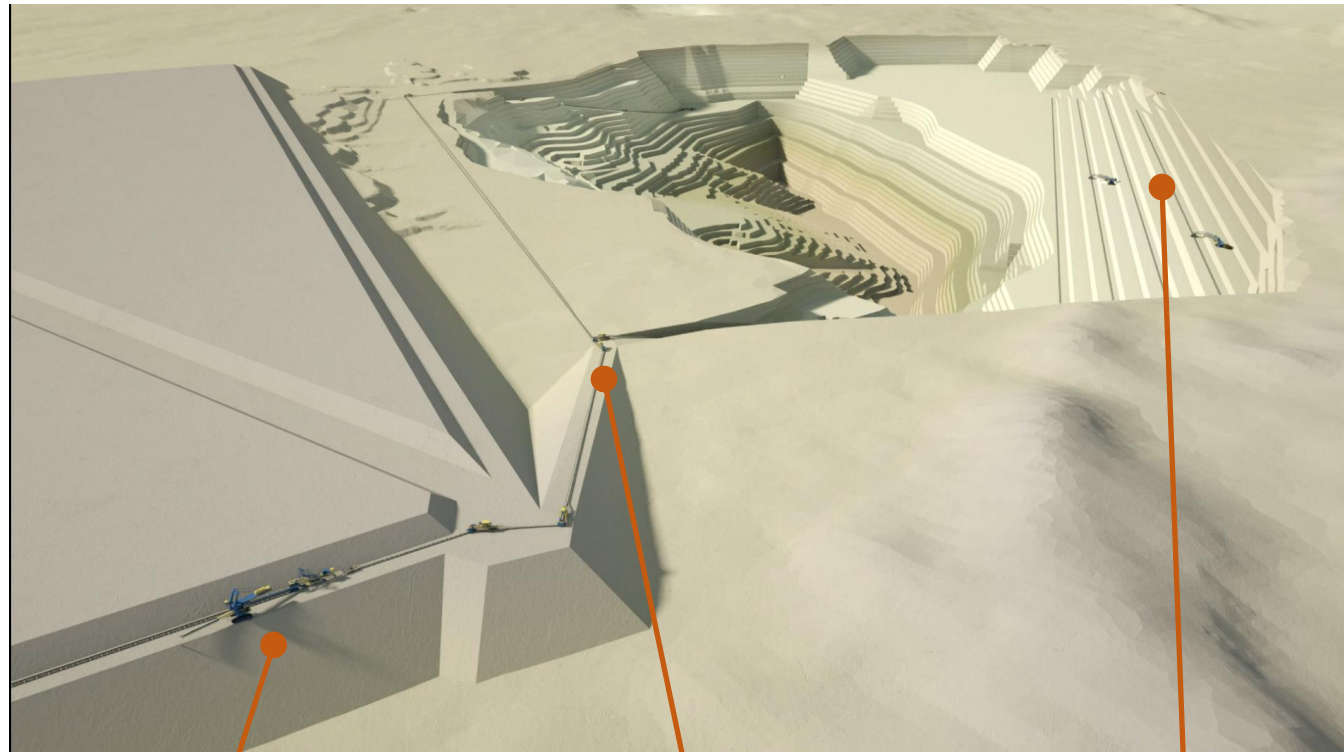
**MINE PLANNING BY MCI**  
**EXAMPLES**



# MINE PLANNING & DESIGN SERVICES

## Implementing a Continuous BWE System

- **Excavation Planning:**  
We plan excavation areas in advance, calculate volumes, estimate the duration of each cycle, and coordinate the interaction of multiple excavation lines. This ensures precise control, optimized efficiency, and reliable execution.
- **Dumping Planning:**  
We plan every step of the dumping process in detail, including precise schedules and coordinated sequences. By managing multiple dumping lines in parallel, we ensure efficient interaction and achieve the desired results as quickly and reliably as possible.
- **Belt Conveyor Routing:**  
As the key of the continuous material transportation, the conveyor transportation of material needs a specific planning according to the site conditions and topography. Long distance and curved conveyor installations will be considered and engineered.



# MINE PLANNING & DESIGN SERVICES

## IPCC for Ore & Waste

### Task:

Investigation of IPCC for 100 Mtpa Ore & 180 Mtpa Waste during feasibility stage respecting the original schedule with 9 pushbacks

### Solution:

The ore system consists of two semi-mobile gyratory crushing stations, two parallel Overland-Conveyors over mountainous terrain towards a stockpile with 3.2 Mt capacity. The 60 km long overland-conveyor towards the processing plants has been investigated by another expert team.

In addition to the initial ex-pit location of the crushers, one IPCC location for the first six years and another location for years 12-15 had been designed within the schedule.

The waste system consists of three crushing stations feeding two spreaders and one truck load-out, saving 180 m of truck-lift.



Semi-Mobile Ore Crushers



Semi-Mobile Waste Crushers



IPCC Stage 1



Waste Dump Development



Ore Stockpile



Waste Dump Completion

# MINE PLANNING & DESIGN SERVICES

## Exemplary Study For Waste IPCC

### Task:

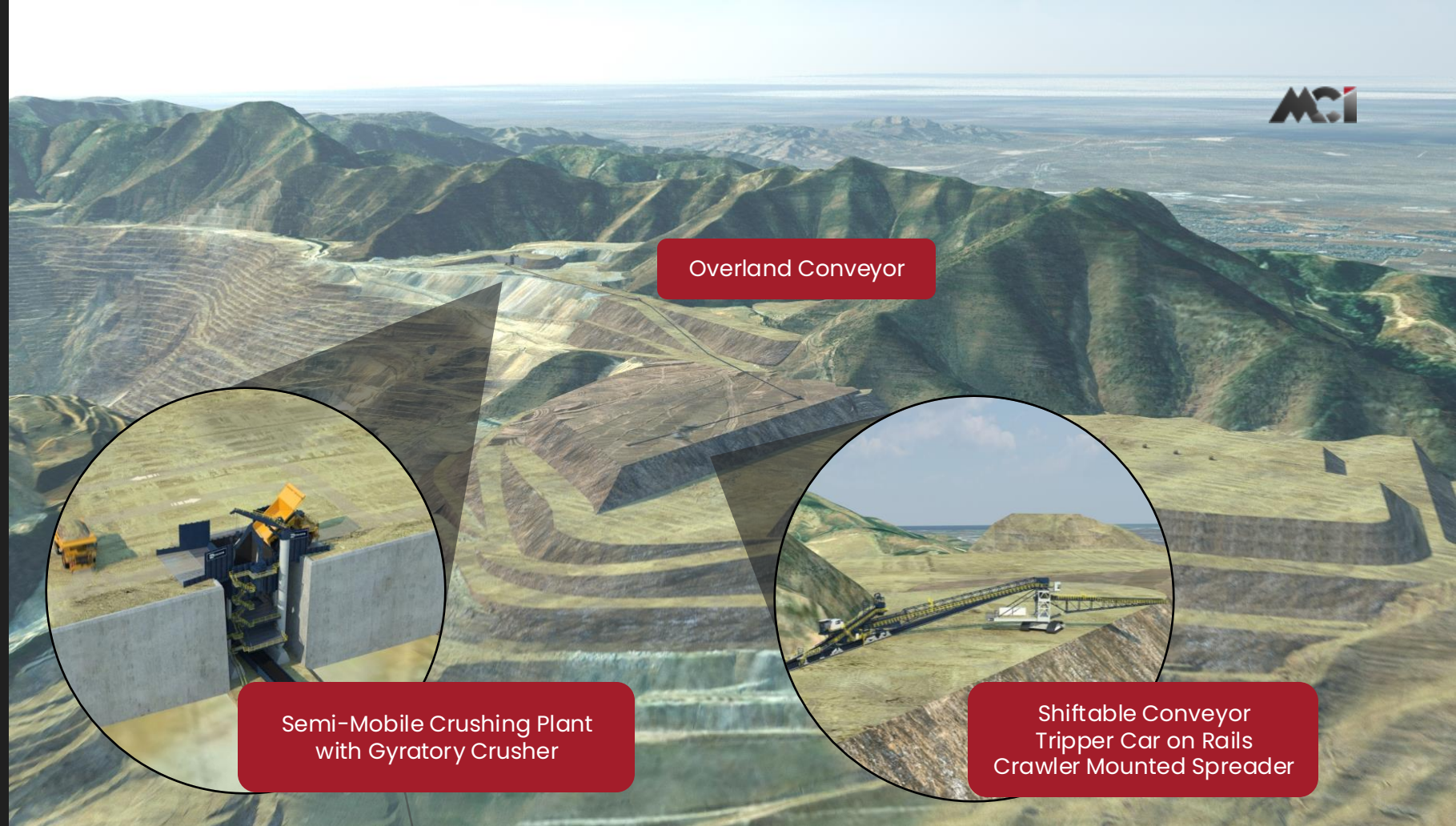
Support of the prefeasibility investigation for handling of waste by IPCC. Focus was the reduction and OPEX and CO<sub>2</sub> emissions

### Solution:

IPCC system located aside the pit at the crest of the dump. Significant lift in transportation is done by conveyors.

Mine design incorporates a large crusher, connecting conveyor routing and the dumping sequences for the mobile spreader.

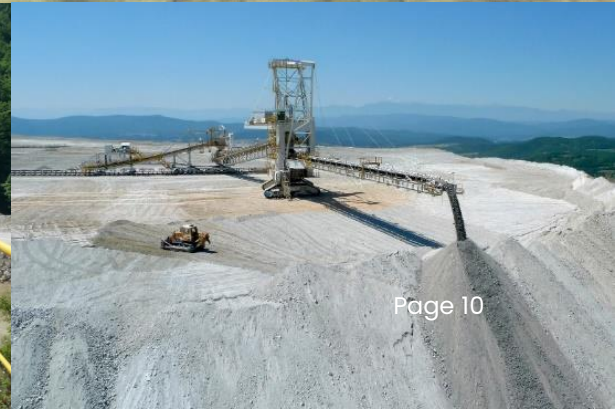
Additional support works are considered by use of exiting small dump truck fleet.



Overland Conveyor

Semi-Mobile Crushing Plant with Gyratory Crusher

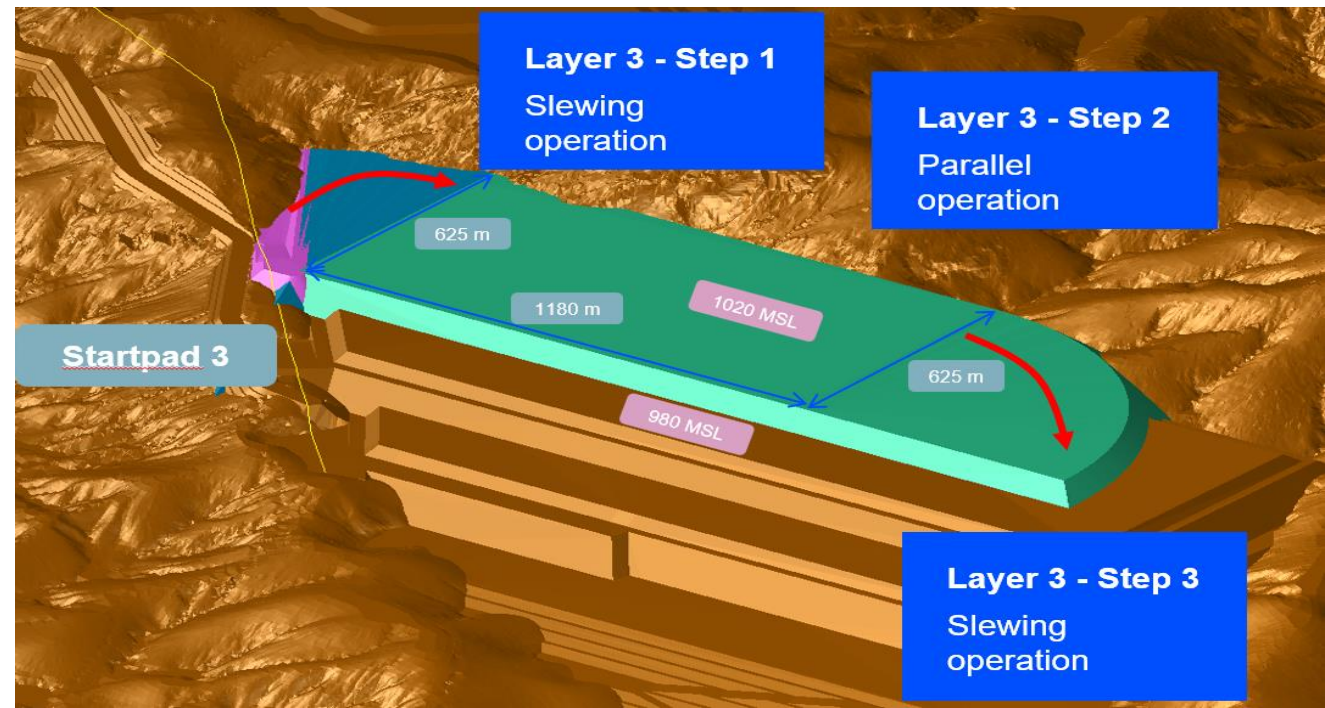
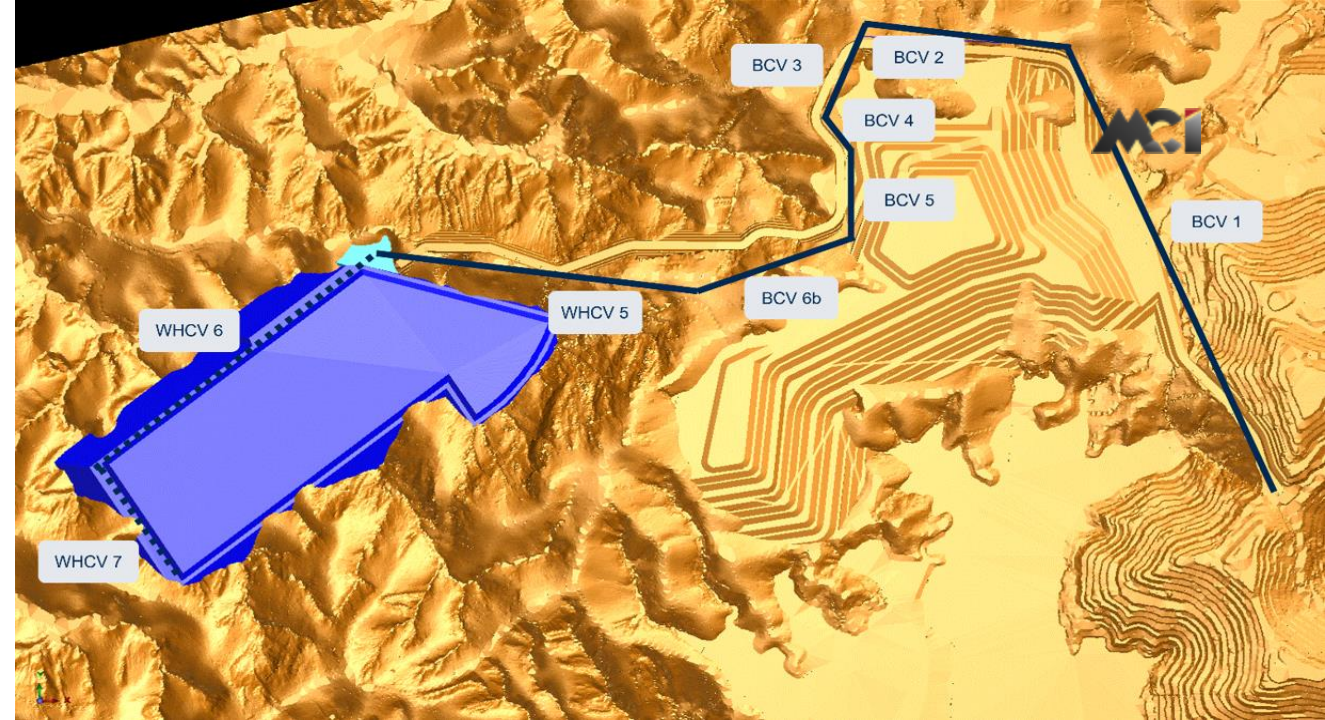
Shiftable Conveyor Tripper Car on Rails Crawler Mounted Spreader



# MINE PLANNING & DESIGN SERVICES

## WASTE HANDLING in an IRON ORE MINE

- **Task:** Investigation on an overland conveying system from primary crushing location to waste dumps
- **Mine Planning & Optimization:**
  - Stepwise scoping of four (4) routing solutions
  - Detailing of preferred routing
  - Dump development planning
  - Preliminary project execution scheduling
  - CAPEX & OPEX estimation
- **Incorporation of :** Dynamical analysis of horizontal and vertical long-distance conveying



# MINE PLANNING & DESIGN SERVICES

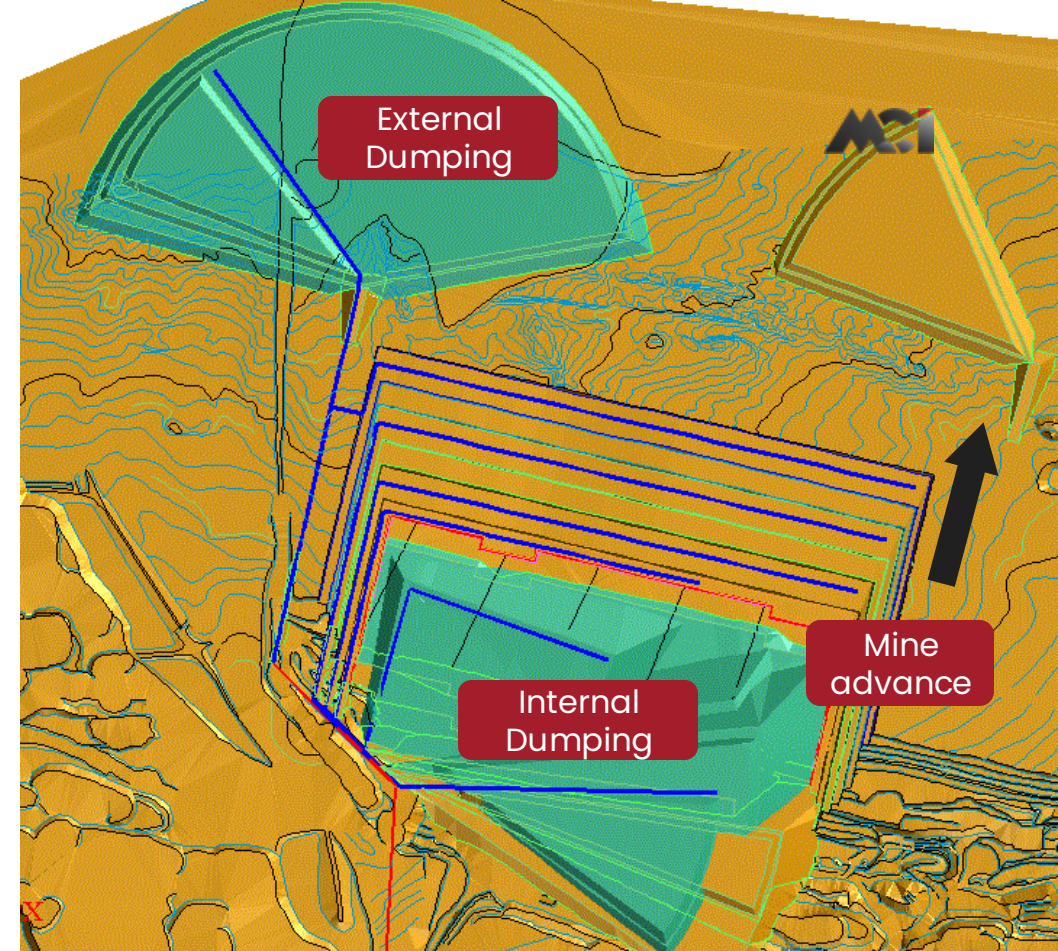
## Exemplary Study for IPCC Implementation in a Coal Mine

### Main Task:

Implementation of conveyor transportation under consideration of the geological coal deposit model

### Scope of work:

- ✓ Creation of the coal seam model based on drill hole data base
- ✓ Development of the future mine advance
- ✓ Project scheduling according to integration of required conveyor lines
- ✓ Calculation of external and internal dump volumes
- ✓ Preliminary re-organization of required manpower
- ✓ CAPEX/OPEX for the continuously working equipment
- ✓ Financial modelling





**INTERESTED IN  
HAVING A PIT-  
STOP WITH US?**

**ONE TEAM  
ONE MISSION  
ENDLESS SPIRIT**