



ACARP matters because it enhances life-of-mine landform management: 3d-Dig

Spoil management in open cut coal mines is an expensive exercise, particularly in mines that use pre-strip fleets in conjunction with draglines to remove overburden. Hauling distances and re-contouring activities have a significant impact on costs. Poor long-term planning has resulted in some mines needing to dump spoil over previously rehabilitated areas because they have under-estimated the footprint required for spoil piles and pre-strip dumps. Life-of-mine landform and spoil transport analysis could significantly reduce costs and avoid the need to redo rehabilitation works.

Industry target

- Develop a computer-based system to study, design and optimise overburden removal including:
 - ⇒ Highly detailed short-term to medium-term design simulation
 - ⇒ Life-of-mine spoil management and landform design, including design for integrated dragline and truck/shovel operations
 - ⇒ Long-term dumping schedule.

Industry investment

- ACARP: \$505,000
- Three projects.

3d-Dig 2000



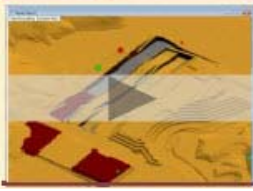
Automated Excavation of Medium Term Schedule.

This clip shows the automated excavation of a medium term schedule. The schedule covers several strips and two independent pits.



Automated Dump Sequencing.

Excavation and dumping for a short/medium term schedule are modelled in this clip. The excavated material is dumped to a hierarchy of four dumps.



Life of Mine Dump Modelling.

This clip shows the automated excavation and dump of a complete life of mine.



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Results

- Development of the 3d-Dig 2000 mining simulation software package. This flexible modelling system:
 - ⇒ Allows for large-scale excavation and dumping, and highly detailed incremental simulation conforming to a schedule
 - ⇒ Fleet productivity for draglines, truck/shovel and dozer systems with dynamic simulation of equipment on the haul/transport route
 - ⇒ Detailed volumetric and productivity reports
 - ⇒ Topographic models of the operation at any stage of the schedule
 - ⇒ Selective dump (material) modelling, including stratified dumps
- 3d-Dig 2000 users can improve allocation of waste to different equipment types and carry out:
 - ⇒ Life-of-mine landform and spoil transport analysis
 - ⇒ Pit design and schedule optimisation
 - ⇒ Troubleshooting studies (such as access, spoil fit)
 - ⇒ Research and validate new and novel mining methods.

Return on investment

- Reduction in rehandle and rehabilitation costs
- Reduction in life-of-mine haulage costs
- Reduction in mine closure costs.