

Modernising a Water Network Build

The Customer

Newgrange is a mining engineering consultancy firm with extensive experience in production, mine planning, technical and financial evaluations internationally.

The Challenge

An underground copper-gold mine in Australia, had a pressing need to enhance its framework of the clean, dirty and emergency mine water pumping streams. The existing framework consisted of a plethora of CAD drawings, individuals' unique knowledge and numerous details omitted or unknown. This further complexified the problem of accurately simulating flows from 15 boreholes due to their interdependent relationships at pipe junctions and nodes. In conjunction, there was an additional upskilling requirement of the workforce in charge of managing these fluid distribution systems.

The Solution

Newgrange conducted an on-site visit inspecting the major pumping infrastructure and provided training to onsite engineers. A new naming methodology was introduced, changing primary layer names to represent specific pipelines by pump station and water type. Newgrange also recommended Pumpsim DESIGN as a solution to accurately 3D model borehole flows and fluid distribution systems. This involved calculating system curves for each borehole and stream, estimating flow versus system curve. Once modelled, Pumpsim provided the ability to run 'what if' simulations, validating the supply network.

The Results

Newgrange updated and modernised the entire water network model, achieved accurate borehole flow simulations in Pumpsim DESIGN and provided effective engineer training. They proposed an accurate modelling method based on changing water table heights. Dynamic simulations through Pumpsim proved highly valuable, identifying several stalled and cavitating pumps. This mitigated future replacement costs potentially running into the hundreds of thousands of dollars annually through early detection and redesign, but also provided sound water optimisation management ensuring a more reliable production schedule.



KEY ADVANTAGES



100%
Synthesised & modernised all framework data into an intuitive 3D model.



\$100Ks
Potentially saved in pump replacement through early detection and redesign.



OPERATIONS
Enhanced ability to risk assess water network maximising production.



An intuitive and interactive 3D modelling software for the accurate design, optimisation and simulation of complex real world pump and liquid distribution systems. It seamlessly enhances decision making through automatic calculation of flows and pressures. Try it today!