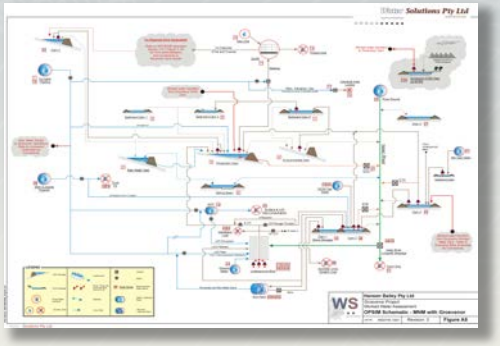
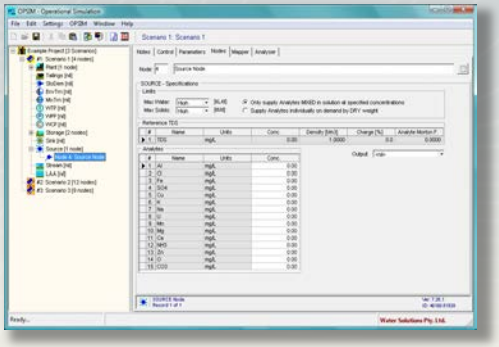
Simulation for Design and Decision Making - Natural and Industrial Water Resource Systems

OPSIM is a general-purpose, operational simulation solution software program for the expert modelling of both natural and industrial water resource systems. The software provides technicians and managers with a robust and powerful tool to handle the most demanding situations with ease and without compromise.

Comprehensive time series tracking of water, solids (tailings) and associated geochemical inventories is provided. An extensive suite of predefined simulation components allows rapid development of system models, while in-built mathematical and statistical analysis functions offer rapid assessment and reporting of simulation outcomes through tabulation or multi-line plots.

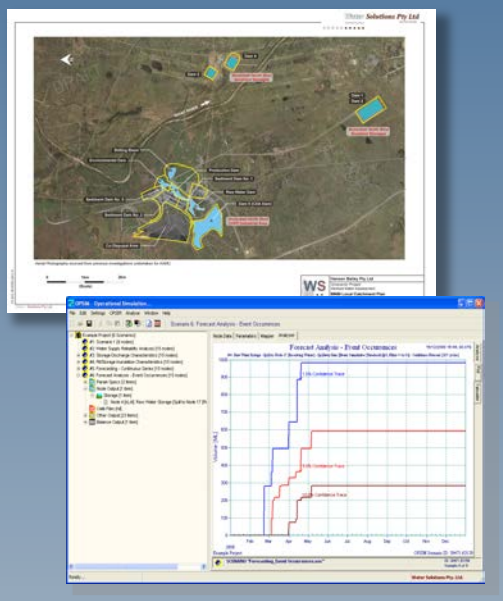
OPSIM allows the user to focus on the outcomes…
OPSIM focuses on outcomes…
OPSIM is outcomes…





USERS

OPSIM is designed to meet the needs of a vertically integrated user base ranging form technical to managerial users. In the highly interactive environments of operational systems, a single OPSIM model can fulfil the decision support needs of all key stakeholders.



For example, opening a new mining pit within an established operation is likely to:

- increase the water harvested from the local site catchments
- reduce the net demand of externally supplied raw make-up water
- increase the risk of uncontrolled spill from site dams
- increase the contaminated watershed commanded by the site
- increase the risk of pit inundation if water cannot be spilled more frequently from site dams
- Impact on tailings storage capacity
- and more…

OPSIM provides a valuable tool for rationally quantifying these situations in terms that are meaningful to multiple stakeholders.

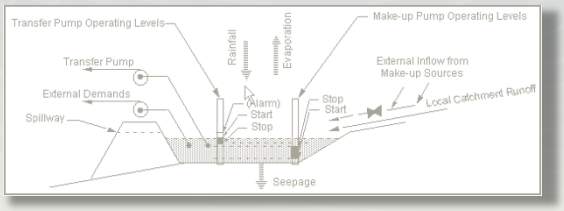
For example:

1. Pump Crew Manager - capacity of pump inventory on hand
2. Technical Services Manager - quantification of mitigation measures with respect to size / capacity
3. Mine Manager - cost of mitigation measures versus production benefit
4. General Manager - cost of risk analysis.
5. Production Manager - effect on production
6. Pit Manager - days of lost access to pits due to flooding

A single OPSIM model delivers a robust basis for coherent, clear and consistent decision-making to meet with the need of the most demanding stakeholders.

Why Better

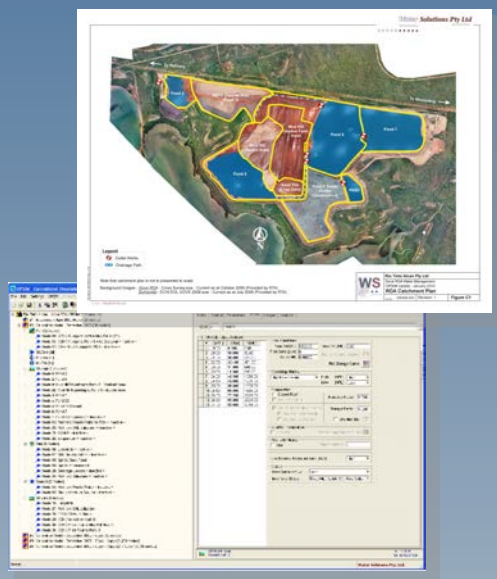
- Designed and maintained by engineering and scientific experts in the field
- Up to date leading edge technology
- Tailored specifically to meet with the needs of the engineering and mining industry
- Proven industry track record – used by most major mining houses in Australia
- Transparent modelling and analysis – modelling basis and all data clearly defined and technically supported
- Provides a concise record of system design and operation
- Provides a basis for comprehensive water balance auditing
- Easy to use
- Rapid model development
- Intuitive user interface
- Designed to make use of “real world type modelling parameters



APPLICATIONS

OPSIM is designed for application to natural and industrial water resource systems that are exposed to the influences of climate. It is a design and analysis decision making tool, specifically tailored to quantify complex system interactions and characteristics in an unbiased, scientifically substantiated and transparent manner. Using OPSIM, climatic characteristics are translated into system characteristics, climatic risk into system risk and cause directly linked to effect.

Modelling schematization is on the basis of functional operation, with each function relating to a measurable physical process. OPSIM models can be used to establish any number of variants with confidence and ease. OPSIM is equally well suited to existing systems or greenfield feasibility assessments.

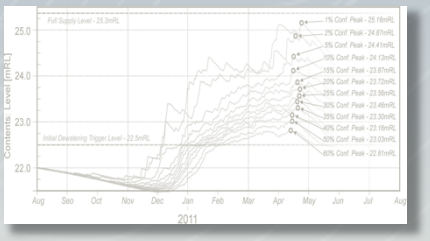


Typical applications include:

- General functional design of mine water management systems
- Sizing of infrastructure for performance (cost-benefit)
- Assessment of exposure risk (eg quantification of system failure or underperformance)
- Assessment / design for environmental compliance
- Contaminated water quality and quality modellng for treatment system design
- System performance forecasting: short-term seasonal, or longer-term up to life-of-mine
- What-if assessments
- Regulator or management justification and forensics

Primarily used within the mining industry, OPSIM is also applicable to the simulation of general water resource systems.

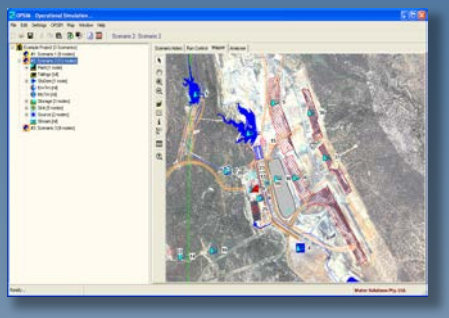
Why Better



- Does not require a degree in Engineering or Computer Science to use
- Ready to use without need for any programming
- Includes built-in data management for quality control
- Allows the creation of read-only models for low cost distribution
- Includes geochemistry (full analyte suits) with density and charge balance tracking
- Provides full operational simulation capability including built post processing analysis and graphing
- All data (an graphics) can be directly copied and pasted into other applications for report purposes
- Users focus on addressing an engineering water management issue rather than solving a technical programming issue
- Full modelling of tailing solids accumulation including moisture and solute retention and consolidation
- Simple plain text open data architecture easily transferred to and from other modelling platforms
- Made in Australia

CAPABILITIES

OPSIM dynamically simulates all key physical processes that go to defining the water management system being modelled. Simulations are configurable on a user defined time-step basis, with selectable resolution ranging from 5 minutes to 1 day. In most instances a 1 day time step resolution is more than adequate.



OPSIM uses the linked node method of schematization, with a range of pre-defined node types used to construct each model. The range of node types provided has been designed to cater for all normal mining situations: coal, gold, zinc, iron ore, bauxite/ alumina, diamonds or uranium; open cut and underground; with or without water quality constraints; with or without water processing / treatment; etc.

OPSIM™ supports three primary modes of operation:

- Static Mode - Generally used where a long-term (eg 100 year) sequence of historical rainfall data is run through an OPSIM model that represents a snapshot of a system operating at a specific point in time. This mode allows the correct calculation of stationary statistical characteristics (eg Annual Exceedance Probability).

- Historical Mode - Similar to Static Mode, but primarily used for forensic investigation, calibration against historical or recreation of historical circumstances.

- Forecasting Mode - Used to make short or long-term forecasts of expected system performance time series traces, with respect to chance of exceedance. Short term forecast applications typically include wet season preparations and emergency action response planning. Long-term forecasts are well suited to mine planning activities. This mode of analysis is also suited to non-stationary situations (eg storage capacity changes over time with tailings accumulations).

OPSIM easily incorporates timeline changes to a system's configuration and operation. Key applications of this capability include calibration to historical records and life-of-mine planning/design.

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The OPSIM Logo …"represents the mergence of water and technology in a controlled way that the water is kept in the sphere – a symbol for OPSIM's water management ability".

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