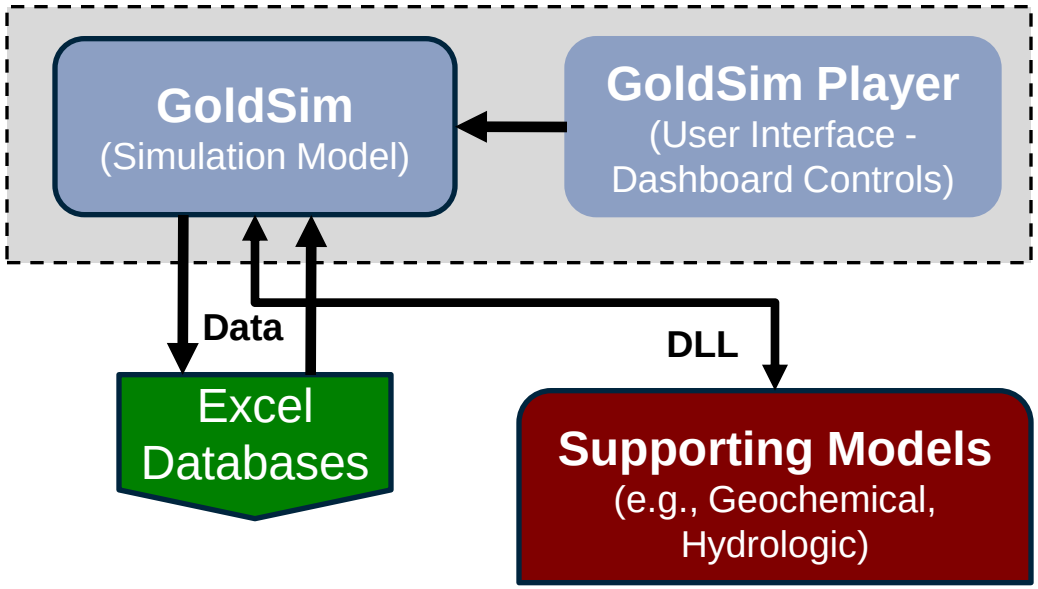
What is Goldsim?

Framework for developing deterministic and probabilistic simulation models

- Water
- Chemistry
- Work-flow
- Decision support
- Reliability
- Risk assessment
- Economics
- Etc.



DLL=Dynamic Link Library

Why use Goldsim?

- GoldSim (www.goldsim.com)

- **Reasons**
- Commonly used for mine and environmental application (large user group)
- Visual development environment with a large number of modeling “elements” including logical and discrete event capabilities
- Strong probabilistic capabilities
- Hierarchical structure
- Integration with Excel and relational databases
- Chemistry capabilities
- Sensitivity and optimization tools
- GoldSim Player dashboard models can be used license-free
- Number of different modules for different types of models

Roll of Models in Water Managment/Process Control

- **Water Management** is a management system (practical) with a strategy and GOAL

- Water balance models/simulations are tools used to:
  - Evaluate risk (planning and operational)
  - Develop stragtegy
  - Communicate strategy

- The development of strategies as a result of simulations that become part of practical planning, guidlines, and steering ”rules” for process operations/mining operations

- Water balance models (Goldsim, HSC sim, or otherwise) ≠ good water management practice in and of themselves

- Integration with steering or control systems in the mines is useful- easier transfer of data, real time updates, can be used as a control system

- However real power comes in simulation and evaluation of risk- not
  - Understanding how the system responds under dynamic conditions
  - Understanding downstream effects

Example-Aitik Clarification Pond

- **Goal:** Raise clarification pond dam 3 m to increase storage capacity from 13 to 18 Mm3

- **Problem:** Frost damage to sections of the dam core require sinking the water level in the clarification from 6 m in order to repair the dam prior to raising the dam height.
  - Must maintain enough water to keep the mill operating
  - Must discharge within flow and water quality limits as needed (controlled discharge cannot exceed 1/3 of the flow in the recipient water body).

- **Solution:**
  - Understanding the seasonal variation and water level/water requirement showed that we can sink the water level in the clarifcation pond under winter.
  - Risk evaluations for
    - Process water requirement (mine plan)
    - Climate scenarios (too much or too little water have large consequences)
    - Construction timing and plans
    - Dicharge requirements
  - Water balance model used to simulate the solution, with evaluations of risk
  - Model was then regularly updated (weekly basis):
    - Weather, production plan, construction schedule etc.
- **Result: Repair work was completed safely and without deviation from discharge requirements, and without disruptions to the process**