

Heap Leach Optimization Application

Datasheet

IntelliSense.io's Heap Leach Optimization application is a real-time analytics and decision optimization system using AI to help heap leaching Metallurgists and Operators make better decisions and meet their operational KPIs.

Challenges in Heap Leaching

Heap Leaching is a relatively low-cost leaching process that is able to extract target minerals/metals at low ore grades. This makes Heap Leaching the preferred means of leaching, especially in low rainfall climates. There are, however, a few challenges when it comes to Heap Leach operations:

- If fine particle material reports to the leach heaps, it negatively impacts leaching efficiency and other downstream processes, reducing metal production and increasing OPEX.
- The rate of reclaiming gravel from leaching pads is often limited by high residual moisture in these heaps - limiting the overall production rate.
- Inefficient irrigation strategies, high acid consumption and lower recoveries result from operations having significant uncertainty around how ore types and material properties are distributed throughout the heaps/sections.

Knowing the material characteristics and quality of your Heap Leaching pads, and what this means for how you can best operate them, will allow you to make informed decisions about the feed sent to the processing plant, how to irrigate the heap and when to reclaim the spent material.

This will increase your operational efficiency, overall throughput and maximize your leach solution grade.

The IntelliSense.io Solution

Powered by the IntelliSense.io brains.app platform, the Heap Leach Optimization application provides operations with:

- 1. Early warnings** of which material in the mine plan (or block model) will lead to the generation of fines, and guidance on how to mitigate this so the heap leach section is not impacted
- 2. Real-time visibility** on the spatial distribution of properties in the stacked material
- 3. Early warnings** of problematic areas (e.g. high moisture retention) in the heaps, **root-cause analysis** on what caused them, and guidance on how to best compensate for them (irrigation and reclaiming)
- 4. Guidance** on how to irrigate the different modules and plots of the leaching cells for optimal leaching performance & metal transfer to the solvent extraction stages

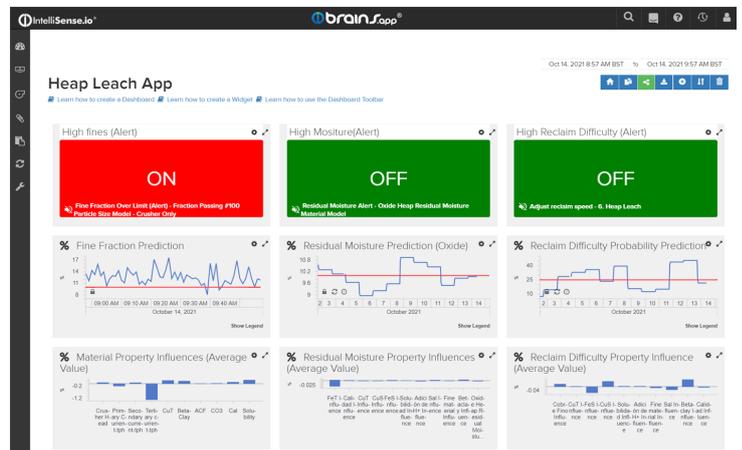


Figure 1: A Heap Leach performance dashboard, alerting Operators of predicted heap properties that will influence the Heap Leach performance, unless mitigated correctly.

Benefits

- **Higher metal recovery** due to improved leaching kinetics by adapting mine planning and blending strategies
- **OPEX savings** on acid consumption and material handling
- **Reduced localized flooding events** and risk of heap blinding on leaching pads
- **Improved reclaimer utilization** & higher overall throughput
- **Reduction in fine material contamination** affecting downstream processes
- **Better process transparency** and reporting



Figure 2: An Opportunity Lost dashboard, highlighting additional financial benefit to be gained in improving the operation of the Heap Leach process

4% improvement in copper recovery from heaps (approx. \$1M) per year achieved by the Heap Leach Optimization Application at a Chilean Copper Mine

Mine to Market: Value Chain Optimization

Powered and connected together by the brains.app platform, the Heap Leach Optimization Application is one of a suite of real-time decision-making applications that uses Artificial Intelligence (AI) to optimize each unit process; and the value as a whole, from mine-to-market.

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