



## CUSTOMER CASE STUDY

# BRK Ambiental: Increasing water security with predictive analytics

BRK - [www.ri.brkambiental.com](http://www.ri.brkambiental.com)  
Industry - Water and Infrastructure

## Challenges

- Ensure the security of 32 dams against potential ruptures, overflows and structural instability
- Streamline the manual and time-consuming process of collecting and managing dam operations data
- Create a data-driven strategy that predicts water availability, improves decision-making, and prevents dam overflows

## Solution

- Collect and analyze real-time data using AVEVA™ PI System™ and use findings to improve dam maintenance strategies

## Results

- Projected avoided costs are estimated at US\$20 million over the next 10 to 15 years
- Near-real-time monitoring enables preventative maintenance, allowing operators to make quicker and more informed decisions
- A 30-day water forecast aids in better management of water levels, preventing overflows, and ensuring water availability

BRK Ambiental is one of the largest private water distribution, collection and treatment companies in Brazil. Its 32 dams provide drinking water, irrigation and flood control. These dams play a crucial role in their surrounding communities and ecosystems and are integral to Brazil's renewable energy transition—more than 70% of the country's electric power comes from hydroelectric energy. But dams can also, if mismanaged, pose serious risks. In 2019, a dam in Brazil collapsed due to a major rupture. It was not a BRK dam, but it showed the devastating effects of what can happen when maintenance is mismanaged. The collapse resulted in the loss of 270 lives and triggered sanitation and environmental hazards by flooding the entire region.

In addition to the potentially catastrophic effects of a dam rupture or water shortage, repairs for just one dam can cost close to US\$1M. Without a doubt, BRK takes dam security very seriously, which is why it is committed to finding new ways to tackle challenges to dam security. Reservoir overflow, water shortages and structural instability are challenges that climate change has only intensified. Proper maintenance is crucial in addressing these challenges—and that maintenance requires data.

“Our projected avoided costs for these 32 dams is nearly US\$20 million for the next 10 to 15 years.”

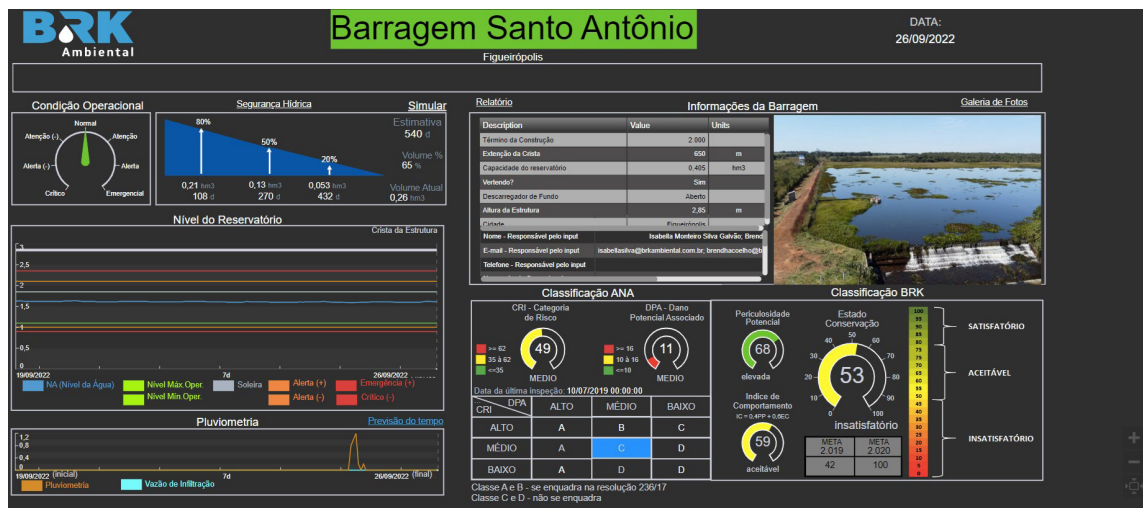
**Andre Park**  
Operational Technology Coordinator. BRK Ambiental

## An algorithm for water security

Knowing how important data is to a good maintenance strategy, BRK wanted its operations data to more accurately forecast dam conditions. More accurate forecasts mean better, faster maintenance decisions, which helps BRK keep its water resources reliable and safe. So BRK developed an algorithm using AVEVA PI System to increase the accuracy and speed of its forecasts and optimize operations.

As Andre Park, Operational Technology Coordinator for BRK, said “Before, operators and engineers had to go personally to the dams and had to write down all the data, and then upload it back in our system. Now we have this [data] incoming every hour automatically from the dam sensors.” This operations data is now consolidated in one place, which enhances the accuracy and visibility of dam data and eliminates the need for paper and labor.

BRK's new data analysis system automatically collects and analyzes dam data in near-real time. It combines this data with information and analysis about the behavior of dams from previous years, as well as factors like climate and rainfall, for more advanced predictive analytics. Operators can now make quicker, more informed decisions to prevent ruptures or overtopping.



Dashboard showing dam data and critical alarms



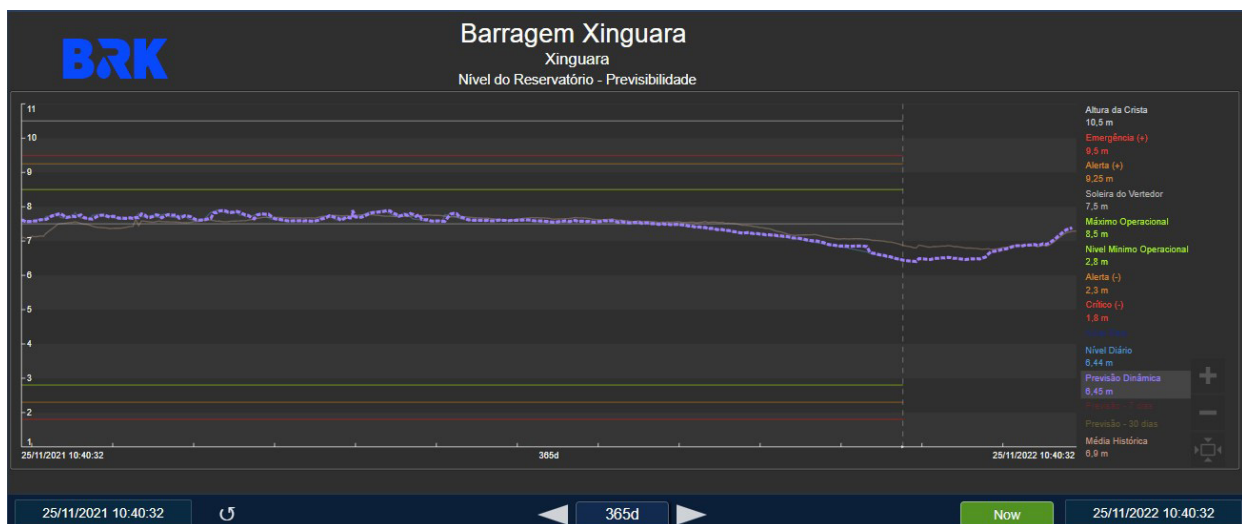
## From collection to analysis to notification

First, BRK collects data like dam levels and rainfall using AVEVA PI System, both automatically and using the system's manual logger as a backup. This near-real-time data comes in every hour and is stored in the system's data archive, where operators perform calculations on the data and set alarm limits.

BRK uses AVEVA PI System's asset framework to predict the behavior of dam levels. BRK then visualizes this enhanced contextualized data with AVEVA™ PI Vision™.

Operators and engineers can access this data securely from anywhere for mobile inspections and diagnostics.

The company then uses the system's automatic notifications to send emails to the dam's operators if the limits exceed the ones that were set. The operators can drill down into more specifics about the alarm and quickly decide what to do. This improved operational efficiency means increased water security.



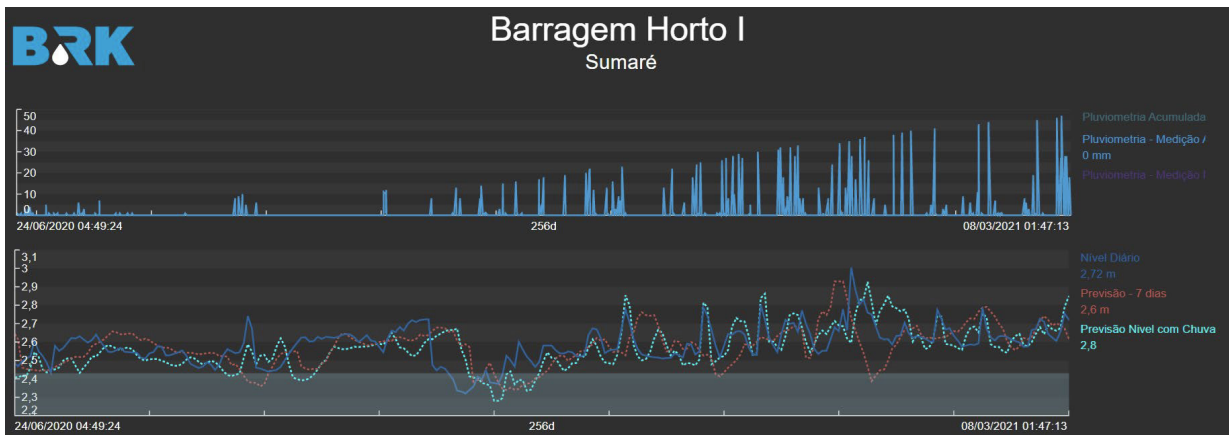
Operators can easily see dam water levels and make a decision: drain the water or wait for it to stabilize?

## BRK saves a projected US\$20M in repairs

For each dam, BRK has a dashboard that provides information about the condition of operations, water availability, water levels, rainfall, risk classification and safety levels, along with a historical trend line. This overview gives operators access to a 30-day forecast that includes alert levels based on the data collected. If a particular dam has an alert that the water level is reaching maximum capacity, operators can look at other data in the forecast to make a decision about whether to drain the water from a dam or wait for the water level to stabilize.

It's a balancing act: BRK needs to avoid overflows and ruptures but also make sure there's enough water to prevent a shortage.

Increased water security means that the water in BRK's 32 dams goes where it needs to go, mitigating risks to people and the environment—and it saves BRK money in preventive maintenance. The organization projects avoided costs at nearly \$20 million for the next 10-15 years, as the cost to rebuild from a dam rupture is around a million dollars.



Use of rainfall data enables even more accurate predictive maintenance

## Conclusion

BRK continues to try and improve the accuracy of its algorithm, with hopes to be able to increase its forecasts beyond 30 days. Evolving conditions due to climate change and aging infrastructure mean that accurate predictive data analysis and preventive maintenance will continue to be paramount in the management of water and wastewater.

BRK is committed to keeping its water, communities and environment safe. It recognizes the importance of data in this endeavour, and its partnership with AVEVA is integral to ensuring the accuracy of its predictive analytics.

For more information,  
[watch the full presentation here.](#)