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Pitney Bowes Software

CASE STUDY

Curragh Mine

"IN REAL TERMS, THE INVESTMENT WE MADE RELATIVE TO THE BENEFITS WE'RE GETTING IS REALLY SMALL."

Matt Crisp, Environmental Adviser, Curragh Mine

3D KNOWLEDGE EMPOWERS CURRAGH MINE.

Challenge

Curragh Mine needed to increase its understanding of the dynamics of its on-site water management. Central to achieving this objective was the need to gain a more accurate, and more visual, measurement of water volume. And, in the process, ensure that dam monitoring was conducted at the highest levels of safety.

Solution

Making use of complementary technology, Curragh Mine sourced a solution provided by Sentinel Pty Ltd, comprising MapInfo Professional GIS software, Encom Discover 3D modelling software, Sentinel Acoustic Doppler Current Profiler (ADCP) system, and Sentinel's DataSight environmental database management system.

SENTINEL PTY LTD

SUMMARY

Curragh Mine covers an area of 12,600 hectares (approximately) in the coal-rich Bowen Basin of central Queensland, some 200 km west of Rockhampton. One of Australia's largest independent coal producers, Curragh currently produces 6.5 million tonnes of export coal and 2.5 million tonnes of domestic coal a year.

AN EFFECTIVE SOLUTION FOR WATER RESOURCE MANAGEMENT

To meet an increased need to understand the dynamics of their on-site water management processes Curragh engaged Sentinel Pty Ltd, a Pitney Bowes Software (PBS) business partner and environmental consulting company that specialises in remote monitoring systems.

Sentinel provided an integrated and comprehensive solution of complementary technology including MapInfo Professional GIS software, Encom Discover 3D modelling software, Sentinel Acoustic Doppler Current Profiler (ADCP) system, and Sentinel's DataSight environmental database management system.

DataSight provided the platform for managing the raw data, while MapInfo Professional provided the spatial platform. These two products were linked via a MapInfo-DataSight connector developed by PBS, with Encom Discover 3D providing the specialised three-dimensional modelling and visualisation capabilities.

Discover 3D is especially designed for applications in the Natural Resources industries, and seamlessly extends the capabilities of MapInfo Professional as a three-dimensional GIS.

Discover 3D was used exclusively for the Curragh Mine project to visualise and model the multitude of water depth measurements across Curragh Mine's dams and water resources.

An ADCP sits within a one-metre long portable boat, which is remotely controlled by the shore-based operator. The on-board differential GPS unit ensures that surveys can be accurately repeated to within a few percent of the previous surveys. As the boat completes a survey, the ADCP measures the depth of the dam and geographic position. One measurement is taken every second, which, at average speed, gives a measurement every 1.5 metres.

Measurements from the ADCP and GPS units are loaded into Discover 3D and displayed in three dimensions. Discover 3D is then used to create volumetric models of the current dam incorporating the spatial distribution of sediment (Fig 1). This enables Curragh to make an accurate assessment of current dam capacities. The measurement process also allows Curragh to monitor the spatial changes in silting profiles and plumes between surveys and over an extended time period.

"DISCOVER 3D PROVIDES ME WITH VISUALISATION AND A MORE STREAMLINED WAY OF MANAGING DATA WITH ITS DETAILED INTERPRETATION AND ANALYSIS CAPABILITIES."

Matt Crisp, Environmental Adviser, Curragh Mine

RESULT

The system gives Curragh an effective solution for managing its water resources and provides valuable insight into future infrastructure requirements.

BEFORE AND NOW

Before Curragh Mine implemented the PBS-Sentinel solution, this type of information could only be obtained by estimating volumes from dry catchment surveys and then periodically running depth surveys over the dam. The new system has several important advantages over conventional dam monitoring methods. According to Matt Crisp, environmental adviser at Curragh Mine, the procedure is much safer and produces far more accurate, repeatable and informative models. "Sentinel's ADCP, in conjunction with its remote-controlled boat, works the same as running a depth finder over a dam, but nobody has to go out on the water anymore," Crisp explains, and goes on to add, "We now have a significantly more intimate understanding of what the profiles of our water dams look like. Discover 3D provides me with visualisation and a more streamlined way of managing data with its detailed interpretation and analysis capabilities."

HIGHLY RECOMMENDED

PBS and Discover 3D came highly recommended, with a strong reputation for technical support, both during and after the project.

The project at Curragh Mine went very smoothly, according to Crisp. In fact, he says

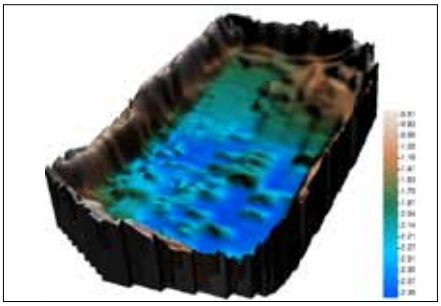

Fig 1. 3D dam model created by Discover 3D.

he would repeat the process almost exactly. "We would probably be a little bit more thorough in the way we conducted our experiments the first time. But in all honesty, from a data management and interpretation point of view, we're very happy with the outcome."

EXCELLENT INVESTMENT

Crisp goes on to say that the primary benefits to the business are achieved by the improvements in operational security and infrastructure planning. The business now has an accurate picture of the state of its water resources infrastructure and how that is likely to change in the future. "It was an extremely good investment from our point of view because this knowledge allows us to make more informed and insightful decisions," he says.

THE NEXT STEP

Curragh Mine is now looking at increasing its investment by further integrating DataSight, MapInfo Professional and Encom Discover 3D to spatially analyse other types of environmental data.

THE PITNEY BOWES SOFTWARE ADVANTAGE

The integration of Pitney Bowes Software and complementary Sentinel Pty Ltd solutions by Curragh Mine has been an excellent investment providing the advantages of improved safety as well as far more accurate, repeatable and informative models. Armed with higher quality information and more accurate knowledge Curragh Mine has been able to make more informed andinsightful decisions regarding on-site water management processes.

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