

## Process water metering at Mogalakwena Platinum Mine



### Challenge

Continuous metering of many process water flows at Anglo American's Mogalakwena mine, the largest surface platinum mine in the world.

### Solution

Anglo American's FutureSmart™ program enabled a permanent installation for a non-intrusive, multi-zone, optical process flow metering system. This installation uses a single, extended fibre optic circuit of several miles in length to enable continuous online metering of mine water flows at several measurement zones throughout a region comparable in size to Lower Manhattan.

The data from all metering zones is capable of being automatically uploaded to a server for the purpose of enabling automatic water balance calculations. Following installation, a calibration operation was executed whereby the system was calibrated using output obtained from clamp-on ultrasonic meters.

### Results

The sensing system was installed in early December 2016, and has been in continuous use since commissioning. The continuous acquisition of flow data from a non-invasive metering network at Mogalakwena represents a critical step towards the development of an automatic water balance system at a tier one mine.

### Impact

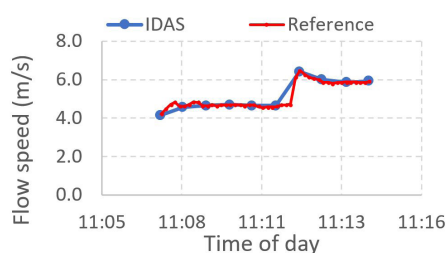
Anglo American was awarded the prize for "Innovation in Sustainability" by Mines and Technology (London, 2017) for this technology application.

## Introduction

Material from Finfer, D., "Continuous process water metering at Mogalakwena Platinum Mine using non-intrusive fibre optics", Water Congress 2018 incorporating 6th International Congress on Water Management in Mining and 2nd International Congress on Water in Industrial Processes, Santiago CL, May 2018.

Mogalakwena is a highly productive surface mine in a water-stressed region with complex water management requirements. In this environment, delivery of accurate, real-time monitoring for all water flows mine-wide will deliver real water savings. To this end, Anglo American commissioned Silixa to install a permanent, non-intrusive, multi-zone, optical process flow metering system. This installation uses a fibre optic circuit of several miles in length for continuous online metering of water flows at several measurement zones throughout a region comparable in size to Lower Manhattan, as indicated within Figure 1 on the right.

The process metering system relies on Distributed Acoustic Sensing (DAS), which can measure the acoustic signals everywhere along a telecommunications-grade optical fibre with a spatial resolution on the order of meters.



The data from all metering zones can be integrated with a server for automatic water balance calculations. The sensing system was installed in December 2016, and has operated continuously since commissioning. A time-coordinated calibration operation was executed using output obtained from clamp-on ultrasonic meters. Continuous flow data acquisition from a metering network at Mogalakwena represents a critical step towards an automatic water balance system at a tier one mine. Once an automatic balance system is achieved across the entire mine-site, the full system will support real-time, automated process control; conserving water and, ultimately, improving metal recovery.

"[Anglo American] expects that this accurate, real-time monitoring of all mine-wide water flows will yield significant water savings. [States the company,] 'Unlike traditional sensors that measure at discreet, predetermined points, this installation uses a single fibre-optic circuit, several kilometres long – enabling continuous real-time metering of mine water flows across multiple points throughout a region comparable in size to lower Manhattan.'"

Source: Under Control, Mining Decisions Magazine, Feb 2018

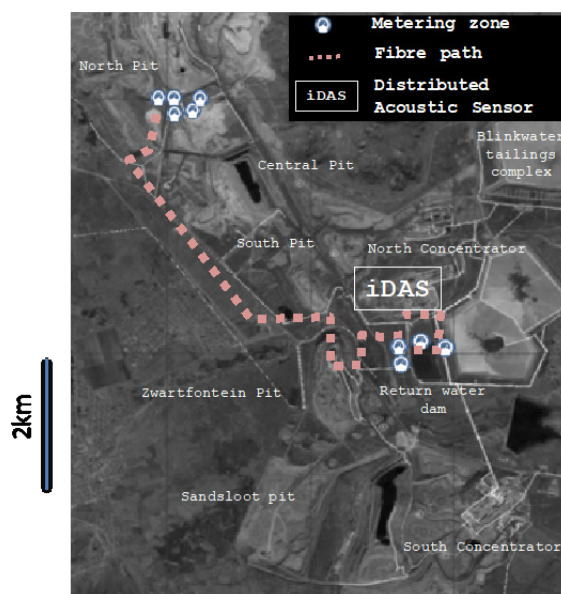


Figure 1. Process metering layout for mine water balance application at Mogalakwena.