

# DEBSWANA ORAPA DIAMOND MINE

## CASE BRIEFING

### Introduction

Due to previous engagements elsewhere at the mine and its successes at Jwaneng, Benmarc was approached by Debswana to provide a dust mitigation solution for the recently refurbished Crusher 3, and Crusher 2 at Orapa Diamond Mine.

Due to stringent security controls, Benmarc remains unable to bring concrete data out of the mine. Therefore the pictures presented within this brief is not ultimately what is needed for a case report.

### Objective

Due to the increase in production in 2011, dust emissions at both crushers became a concern. Primary areas of excessive emissions were at the tip reception bins, crusher bowls, and discharge onto overland conveyors to the silo's. A further concern was the high levels of visible dust when extracting out of the silo's, and discharge onto the stockpiles.

### Solution

Benmarc suggested the installation of a separate system at each of the two crushers, as geographically the crushers are too far apart to be served from a central system. Although there were some differences with regard to the requirements for each of the two systems, design took into account the cost of critical spares holding, and therefore modelled the two systems to be identical.

The systems were built into 3m ISO shipping containers, and controlled by its own on-board Siemens S7-300 PLC's. Although Benmarc employed a dedicated technician to attend to the systems, technically there is no need for interaction from operating personnel. The systems are fully automated and responds to signals provided from plant equipment.

Two separate chemicals are used in the process –

- BM210E – local dust mitigation at tip reception bin
- BM210E – local dust mitigation at crusher bowl and pre-wetting of material
- BM515E – Treatment of material at discharge onto overland belt. This also provided a bond for finer materials to yield an extended downstream benefit

## Consumptions

Although the mine delivers extremely dry ore to the plant at a rate of over 3600tph, the forecasted water and chemical consumption rates were not exceeded in the bid to reduce the emission levels successfully.

- Water consumption: 0.5%/ton
- BM210E Consumption: 0.01L/ton
- BM515E Consumption: 0.06L/ton

## Results

Although we cannot yet produce tangible data in the form of dust level graphs, the available pictures below indicate a dust-free ore delivery.



Crusher bowl without suppression



Crusher Bowl with suppression



Stacking



Close-up of stacking