Case Study:

Rebuilding of haul roads damaged by moving a dragline at South32 Wolvekrans Colliery

Wolvekrans Colliery is a coal mine located in the coalfields of Mpumalanga and is owned by South32. It is an opencast mine using dragline, as well as truck and shovel operations, to extract coal.

DUST-A-SIDE®

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THE PROBLEM STATEMENT

Due to depletion of coal mined at the current pit, a dragline had to be moved to another pit. The dragline has a load capability of 150 tonnes and weighs 3 600 tonnes.

It usually takes several years to disassemble and rebuild a single dragline, or months of planning and preparation to 'walk' them to new mining sites. Given tight schedules and the demand of coal and strict signed contracts to supply coal to clients, this option wouldn't be viable. The mine foresaw that moving the dragline was going to be a huge undertaking. One key concern was that moving the dragline from one point to another was going to cause considerable damage to the mine's valuable haul road network. Due to the weight of the dragline, rebuilding sections of haul road was all but inevitable.

Dust-A-Side currently manages dust on mine primary haul roads at the Wolvekrans Colliery. As industry leaders in haul road construction and management, South32 recognised that Dust-A-Side was best positioned to undertake this project. Given that Dust-A-Side's methodology allows for ease of rehabilitation of damaged sections on haul roads quickly and cost effectively, Dust-A-Side in collaboration with South 32 project manager drafted the scope and executed the project with great success.

DUST-A-SIDE'S OBJECTIVES

> To assist with moving the dragline safely to another pit

> To assist the mine in ensuring the damage caused by the dragline movement on the haul roads was effectively and efficiently reconstructed to their original state

> To ensure that production was not disturbed during the moving of the dragline

HOW DID DUST-A-SIDE ACHIEVE THESE OBJECTIVES?

To prevent any disruptions to production, the rebuilding of damaged roads was done concurrently with the moving of the dragline.

As the dragline moved, a dedicated Dust-A-Side crew would follow the dragline to prepare and repair the damage at an average distance of 500m. The Dust-A-Side crew that undertook this project consisted of a head count of 11 personnel including a site manager, supervisors and equipment operators.

All damaged sections of the haul road were rebuilt with DASProduct. DASProduct is a bespoke dust control product developed especially for the mining industry using proprietary bitumen emulsion technology. It has proven to control fugitive dust, as well as stabilise the wearing course layer on permanent haul roads at mining sites

Throughout the project, DASProduct was conveniently delivered in a liquid form, ready to use and diluted on site to the required application concentration. Upon curing, it bonded the damaged haul road sections and formed an impermeable seal, allowing the haul roads at the mine to perform dust and mud free under all weather conditions.

SCOPE OF THE PROJECT

Safely moving a dragline weighing:	Over 3 600 tonnes
Area of road affected:	9,5 km x 30m = 285 000 m2
Product used:	570 00 litres of DASProduct
Project value:	R5 790 020
Man hours:	Same team currently managing the existing haul road contract (i.e. no additional labour)
Safety incidents:	None reported during the project
Duration of the project to rebuild the damaged road:	6 weeks
Machinery used:	2 x Massey Ferguson tractors, 2 x 14k graders , 2 x B50 water bowsers, 2x B212 Bell Bomag Compactors

PROJECT CHALLENGES

- Creating a balance on existing human resources and equipment acquired for additional construction work
- Existing traffic management – the affected road is the busiest and carries heavy traffic
- Weather conditions – intermittent rain contributed to delays on the project progress
- Ensuring that production continued in all parts of the mine without or minimal interruption
- Accommodating scheduled blasting areas which contributed to further time delays

THE RESULTS SPEAK FOR THEMSELVES

Damage caused by moving the dragline

Damaged roads rebuilt by Dust-A-Side

The following table demonstrates the Roughness Defect Score (RDS) of the DAS Road segment before moving the dragline, during moving the dragline and after the dragline damage was repaired.

Defect Type	Before Dragline Damage 20 March 2019	During Dragline Damage 26 March 2019	After Dragline Damage 16 April 2019
Corrugations		**15.00**	**6.25**
Loose Material	**9.5**	**17.40**	**3.5**
Potholes	**4.00**		
RDS	**13.50**	**32.40**	**9.75**

DASMETRICS ANALYSIS REPORT OF DRAGLINE DAMAGE

Green icons = indicates sections of the road with no defects
Yellow icons = roads with moderate defects soon to require repair work
Red icons = roads with severe defects requiring immediate repair work

Road defects before the dragline was moved:

There are few red dots, signifying minimal defects on the road.

Road defects during the move of the dragline:

As can be seen, there are many more red dots soon after or during the movement of the dragline.

Road defects after dragline damage was repaired:

Red dots are once again minimal after repair work

OUTCOMES

South32 expressed their gratitude to the successful completion of this project based on the following:

- Project completed with no incidents
- Workmanship quality and the quick turnaround
- Completed within budget by employing the same crew to manage the current primary haul roads to undertake the additional scope
- The mine haul roads returned to the original state and continue to perform dust-free throughout the mine.
- All roads have been restored to their original state prior to the moving of the dragline.

DUST-A-SIDE IS PROVEN TO OUTPERFORM

Dust-A-Side are world leaders in providing holistic road management and dust control solutions to the mining industry.

Talk to us today about arranging an obligation-free technical consultation, complete with preliminary report.

At no charge to you, an advisor from our team will:

- Conduct a thorough inspection of your site
- Assess priority areas including roads, process facilities, conveyors or stockpiles
- Study your current operating practices, processes and systems
- Organise laboratory testing of material and water samples
- Explore opportunities to improve efficiency and reduce costs
- Perform a cost benefit analysis

Following the consultation, our commercial personnel will prepare a preliminary report, detailing recommendations and solutions to meet your needs as well as proposed next steps.

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