



Olympic Dam Case Study

Dust Control Solutions for Mining Shutdown Works

Project Summary

Client	BHP
Location	Olympic Dam Mine, Roxby Downs, SA
Application	Dust Control Solution for Mining Shutdown Works
Project Summary	Rental of JMS-60-MES Mobile Dust Collector

Client Overview

The Olympic Dam Mine, owned by BHP, is a large poly-metallic underground mine located in Roxby Downs, South Australia. It is the fourth largest copper deposit and the largest known single deposit of uranium in the world.

Client Challenge

Shutdown works are an essential part of running a mine and allow for work to be conducted safely and efficiently.

Rebuilding of the furnace at the BHP Olympic Dam site was the largest planned maintenance shutdown in the mine's history. The \$350 million project included upgrades to the smelter, refinery, concentrator, and other key infrastructure. Key project goals were zero injuries and no delays to the project timeline.

Horizontal Smelter Furnace Rebrick

Over time, the extreme heat in the smelter furnace erodes the brick lining which then needs to be rebricked.

The demolishing of the existing brick lining is a manual process undertaken by workers in a confined environment and creates hazardous dust including Respirable Crystalline Silica (RCS) that needs to be controlled to protect the health and safety of workers and the surrounding environment.

Health and Safety

Driving Demand for Dust Control

Respirable dust poses a serious risk to the health and safety of workers, and / or an impact on the surrounding environment.

Demolition and construction works are governed by regulations across Australia by the Environmental Protection Authorities established in each state, who administer legislation covering air and water quality, waste, contaminated land, noise, pesticides and hazardous waste.

Safe Work Australia is also actively working on national policy to improve work health and safety (WHS) and workers' compensation arrangements across Australia.

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Silica is a natural substance found in most rocks, sand and clay and in products such as bricks and concrete. When these products are cut or sanded down, they create dust that be fine enough to reach deep inside the lung, known as Respirable Crystalline Silica (RCS) which can cause a harm to health. Silica dust can cause silicosis, a serious irreversible lung disease, and lung cancer. Inhalation of brick dust or RCS can lead to serious and sometimes fatal illnesses, particularly if breathed for prolonged periods or in a very high volume for short periods.

Under the Workplace Health and Safety Act (WHS) Regulations any Person Conducting Business or Undertaking (PCBUs) have specific duties to manage the risks to health and safety when using, handling, generating and storing hazardous chemicals, including silica. They also have a duty to ensure the workplace exposure standard for Crystalline Silica is not exceeded and to provide health monitoring to workers.

Managing risks and worker exposure to silica can be achieved by selecting and implementing measure using the hierarchy of controls, including engineering controls that minimise the risk of exposure to generated dust, including the use of dust collection attachments. The workplace exposure standard for respirable crystalline silica that must not be exceeded 0.05mg/m³ (eight-hour time weighted average).

Our Solution

By calculating the area of the furnace and the duct configuration required to extract dust from the working area, the Grydale engineering team calculated the size of dust collector required to place the furnace under negative pressure and provide effective dust control for the duration of demolition and construction works. This solution was then positioned to BHP by Swart and Sons as part of a shutdown works contract. Upon award of the contract, Swart and Sons cross-hired one of our rental fleet for the duration of works.

The dust collector was positioned outside of the furnace, to place the working area under negative pressure. Dirty air was pulled from the working area to the dust collector and clean air was exhausted to the atmosphere.

Results

The overall shutdown works project was one of the largest in the Southern hemisphere to be completed on time with zero injuries, a testament to the planning, contractors and the solutions used to execute works.

The use of the Grydale JMS-60-MES (60m³/s, Mobile, Electric, Skid) dust collector provided an effective dust control solution for the rebricking of the horizontal furnace, protecting the health and safety of workers on site and the surrounding environment.

Projects that required dust collectors with large air volumes previously had to use of multiple smaller volume dust collectors. However Grydale offer 40m³/s (85,000 CFM), 50m³/s (105,000 CFM) and 60m³/s (125,000 CFM) units in their rental fleet and are therefore able to offer a cost effective and efficient dust collection solution for shutdown works.

Using a single machine has the following benefits:

- 1) Simplified set up.
- 2) Reduced space requirements on site.
- 3) Cost effective freight and logistics.
- 4) Cost effective operation and maintenance costs of a single dust collector.

If multiple machines were used then the working area would need to be subdivided and multiple duct runs set up to link back to individual machines. There would also need to be more resources on site to run multiple machines.

Grydale. Experts in Dust Control

Our team has over 15 years' experience designing and manufacturing industrial dust collection and extraction solutions.

We focus on adding value through a total service offering, providing ventilation design, manufacture, implementation, ongoing project management and on-site maintenance and technical support.

Contact us for more information.
enquiries@grydale.com.au
+61 1300 929 349

