

Dow Water & Process Solutions

Editorial Project Highlight

Making the Case for Wastewater Reuse in South Africa Open Cast Coal Mine

South Africa's primary resource for generating energy is coal, representing more than 80 percent of the country's energy supply. During the process of power production, coal is burned to generate steam. Steam is then used to drive turbines, which, in turn, generates electricity. Water is an integral component in this process, as it is used to extract and wash coal, and cool the steam to produce electricity.

In countries where water resources are limited or scarce, such as in South Africa, water reuse schemes are implemented to reduce stress on freshwater assets, and promote an environmentally-contained process. Following suit, a local coal mine treats their wastewater produced from mining operations for reuse, and transports it to the nearby power station to be used as make up water in their cooling system operations.



As conventional sand filters and other ultrafiltration (UF) technologies initially used to treat the mining wastewater were found to be ineffective, the coal mine turned to Dow Water & Process Solutions for UF technology as a pre-treatment to Reverse Osmosis (RO), to effectively recover wastewater.

To remove suspended and dissolved materials from the wastewater stream, Dow collaborated with a local OEM to rapidly deploy a modular containerized system. Dow UF membrane technology was ultimately found to have increased advantages over traditional sand filters during pre-treatment, including the removal of particles, suspended solids, and microorganisms from the wastewater.



Most raw water contains particulates, such as silt, colloids and bacteria, which can negatively impact the performance and economics of downstream operations and demineralization equipment. These contaminants can be effectively removed using Dow technology to facilitate continued and consistent performance of boiler feed and water treatment systems, and reduced environmental impact.

After the coal mine's wastewater is treated with UF and RO, the recycled water is transported to a nearby power station, where it is further demineralized with Dow ion exchange resin technology, and used as boiler make-up water in the cooling system.

About Dow Water & Process Solutions

A global leader in sustainable separation and purification technology, Dow Water & Process Solutions is making real progress in the world. We're helping to make water safer and more accessible, food taste better, pharmaceuticals more effective and industries more efficient and spearheading the development of sustainable technologies that integrate water and energy requirements. Dow Water & Process Solutions offers a broad portfolio of ion exchange resins, reverse osmosis membranes, ultrafiltration membranes, fine particle filters and electrodeionization products, with strong positions in a number of major application areas, including industrial and municipal water, industrial processes, pharmaceuticals, power, oil and gas, residential water and waste and water reuse. More information about Dow Water & Process Solutions can be found at www.dowwaterandprocess.com.

About Dow

Dow (NYSE: DOW) combines the power of science and technology to passionately innovate what is essential to human progress. The Company is driving innovations that extract value from the intersection of chemical, physical and biological sciences to help address many of the world's most challenging problems such as the need for clean water, clean energy generation and conservation, and increasing agricultural productivity. Dow's integrated, market-driven, industry-leading portfolio of specialty chemical, advanced materials, agrosiences and plastics businesses delivers a broad range of technology-based products and solutions to customers in approximately 180 countries and in high growth sectors such as packaging, electronics, water, coatings and agriculture. In 2013, Dow had annual sales of more than \$57 billion and employed approximately 53,000 people worldwide. The Company's more than 6,000 products are manufactured at 201 sites in 36 countries across the globe. References to "Dow" or the "Company" mean The Dow Chemical Company and its consolidated subsidiaries unless otherwise expressly noted. More information about Dow can be found at www.dow.com.

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