

WEC Projects to use natural processes at Botswana mine sewage treatment facility

WEC Projects has secured a R3m contract for the expansion of the Lucara Botswana's Karowe diamond mine's sewage treatment facility. The mine requested a man-made natural reed bed wetland system that will provide a "polishing" phase to the treatment process, using natural organisms and filtration processes to further clean the wastewater.



Source: Supplied

The company installed the original treatment plant in 2012 and will integrate the new system into the existing facility, increasing throughput from 100m³ to 150m³ per day to meet the requirements of an increase in the number of staff at the mine.

Lucara Botswana's Karowe diamond mine is located near the village of Letlhakane in the eastern Kalahari Basin region of Botswana. Currently an open pit mine, it is expected to cease open pit activities by 2026, after which it will continue mining underground, extending its operational life to around 2040. More than 1,000 metres above sea level, the mine operates in a region where temperatures average 35°C and water is scarce; so much so that the Government of Botswana has legislated mandatory water-saving requirements for the industry.



Source: Supplied

Water conservation

Says Wayne Taljaard, managing director of WEC Projects: “This is a particularly unique feature for a mine as usually such reed bed wetlands are built for much larger installations such as municipal sewage treatment. The government’s mandate for water conservation has forced companies in Botswana to apply creative thinking to overcome the challenge of operating in an arid country.”

The main sewage treatment facility will consist of a WEC Projects Model A treatment plant, an extended aeration system using conventional activated sludge to process the sewage. The wastewater passes through a mechanical screen which removes solids and is then treated by a biological reactor which integrates anoxic, aerobic and clarification zones.



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Natural water treatment

After treatment, the water will enter the reed bed wetland area where it will percolate through the reed bed allowing microorganisms to breakdown contaminants such as sulphur, heavy metals and chlorine. The water produced by this process, while not for human consumption, will be reused by the mine for applications such as irrigation and dust suppression.

To create the wetland, a shallow dam will be built, its bottom to be filled with gravel and reeds planted. The water from the treatment plant will feed into the wetland area where nature will be left to take its course.

Adds Taljaard, “The reed bed solution offers a number of advantages for the mine as the effluent will be relatively odourless and is flexible enough to cope with fluctuations in input. It also requires little maintenance once it is up and running and will ensure that the mine remains within the constructs of the law.”

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