

Water Management

FACT SHEET

Introduction

Palabora Mining Company operates one of the largest underground block cave copper mines in the world. Naturally, the impact on the environment is significant. However, the Company has a well defined and expertly executed environmental programme to manage this impact effectively.

Palabora's Water Management programme is complex because of the various interlinked processes, large waste disposal dams and the close proximity to the Kruger National Park and the Olifants River.

Palabora's employs experienced environmentalists, and uses expert consultants, to assist with identifying the potential impact on the environment, quantifying these impacts and then implementing control measures to minimise these impacts.

Water Management Strategies

The Lepelle Water Board supplies industrial and potable water to users in the Phalaborwa Region. The water is pumped from the Phalaborwa Barrage in the Olifants River, purified and distributed to the various users. The Olifants River is already under stress, especially during the dry winter and spring months, and it is essential for industries reliant on the river to participate in the management of its catchment.

Palabora is actively involved in local water management meetings, held to discuss management strategies for the region. A computerised water balance (GoldSim) has been developed to model water quality and quantity. This is a very powerful tool to quantify the impact of a new installation on the water management system.



Process Water Containment

Palabora Mining Company imports approximately 12 mega-litres of industrial water and three mega-litres of potable water per day from the Lepelle Water Board. The industrial water is used in the various processing plants, mainly as a transport medium for and to transport the mining residues (tailings) to the tailings dams. Tailings dam water decants into the return water tailings dam, from where it is recycled back into the processes.

This system is called Palabora's 'Zero Discharge' policy. All water is contained and recycled to various plants for re-use. Over the years, a number of water management systems have been installed to prevent effluent flowing into the natural environment. The following are the most important installations:

Loole Weir

A weir was built in the Loole Creek drainage system before it enters the Selati River. This prevents mine affected water from flowing into the river. From the weir, water is re-directed to the return water tailings dam. A telemetry system was installed at



Loole Weir to constantly monitor the water levels and to warn of overflows in the river. A containment dam was also built upstream to control surge flows into the weir and thus prevent overflows into the Selati.

Seepage Pumps

A number of sump and pump systems have been installed below the wall of the return water tailings dam and at the toe of the tailings dam to capture seepage and pump it back to the return water tailings dam.

Process Water Pumps

A number of sump and pump systems were also installed at various plants to capture effluent and pump it back into the plant. This is essential to prevent soil and water contamination outside the plant areas.

Monitoring Programmes

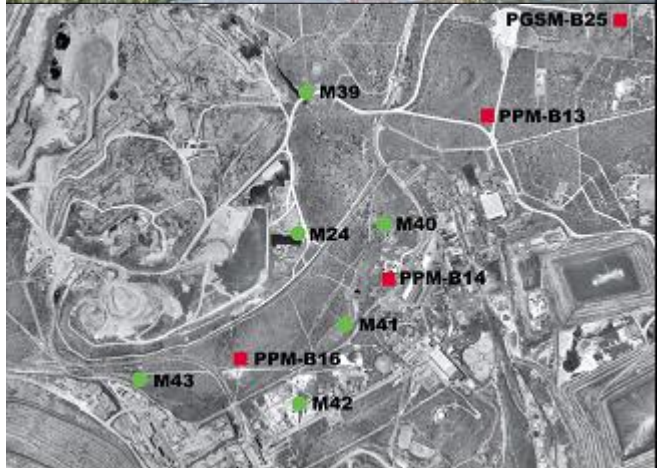
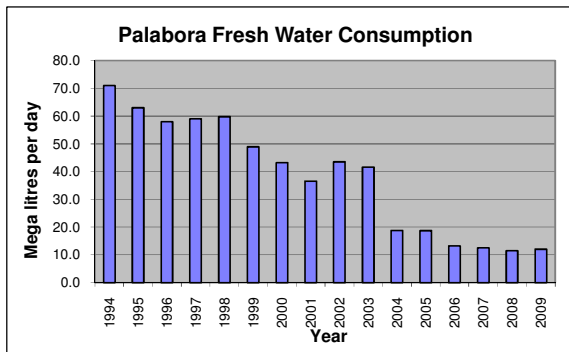
Palabora has implemented routine monitoring programmes to determine the water quality of the various process streams, seepage from the dams, ground water and natural streams. This information is used for impact assessment studies, management decisions and ground water modelling studies.

Surface Water

A monitoring system was developed to monitor impacts and potential impacts from the various plants, dams and creeks, as well as the water quality of the natural rivers and streams outside the mining area. More than thirty monitoring sites have been identified, and routine water samples are collected and analysed according to approved procedures.

Ground Water

More than one hundred boreholes have been drilled on the mine and a ground water modelling and monitoring system has been developed for Palabora. This system is used to model the impact on the ground water system, and to implement remedial measures. Some of the boreholes are pumped to prevent contamination of the natural environment and a seepage trench has been installed along the toe of the tailings dam to capture seepage and pump it back to the return water tailings dam.



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