

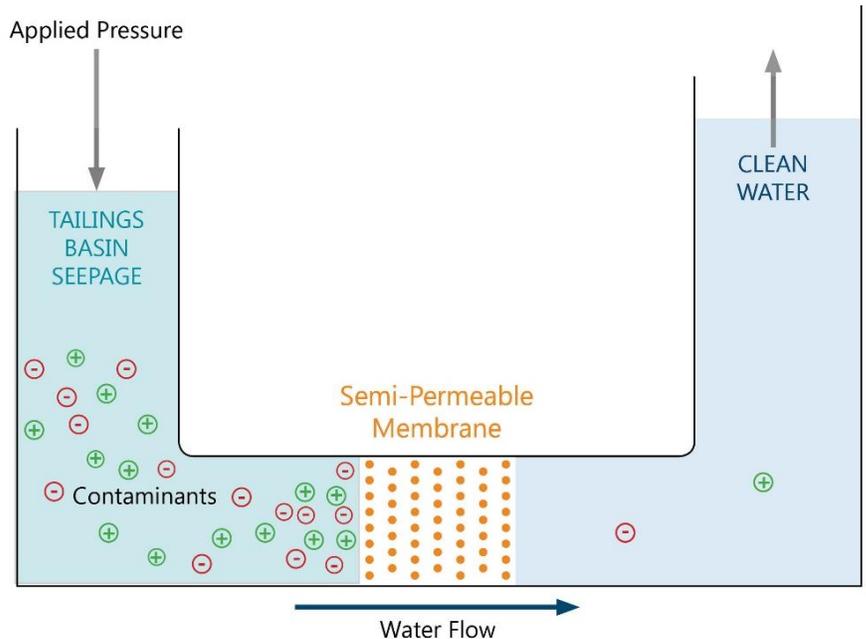
Reverse osmosis

PolyMet will use reverse osmosis, a common type of membrane separation, in its water treatment process.

Reverse osmosis is a common type of water treatment. It uses membrane separation technology that has been in use for more than 40 years. Small reverse osmosis systems are found in many homes, where they are used in “under-sink” treatment systems for improving the taste of tap water by removing salts and other dissolved contaminants. Commercially, reverse osmosis systems treat bottled water and water used in production of other beverages including most canned or bottled soft drinks. In areas with a limited supply of fresh water, reverse osmosis has been used to remove salt from seawater to create drinking water. With continuous improvements in membranes, reverse osmosis remains a state-of-the-art technology for water treatment.

How it works

Using a pump to increase the pressure within a water treatment system, reverse osmosis works by pushing water molecules through a semi-permeable membrane. The size of the pore spaces (holes) through the membrane restricts the flow of charged particles, such as sulfate and other contaminants, while allowing clean water molecules to pass through, as shown in the diagram. The clean water is then stabilized with the addition of calcium and bicarbonate before it is discharged.



The built-up particles that do not pass through the membrane stay in a concentrated liquid waste, called a brine. For the PolyMet Project, the brine will be treated and the solids will be disposed of at a permitted facility or processed in the Hydrometallurgical Plant.

PolyMet will continuously monitor the membrane performance. The membranes will be regularly cleaned, and the cleaning solution will be pumped to the tailings basin pond. With regular maintenance, membranes last for many years before they wear out. When they reach the end of their design life, the membranes will be replaced.