

SELENIUM REMOVAL FROM REVERSE OSMOSIS CONCENTRATE WATERS

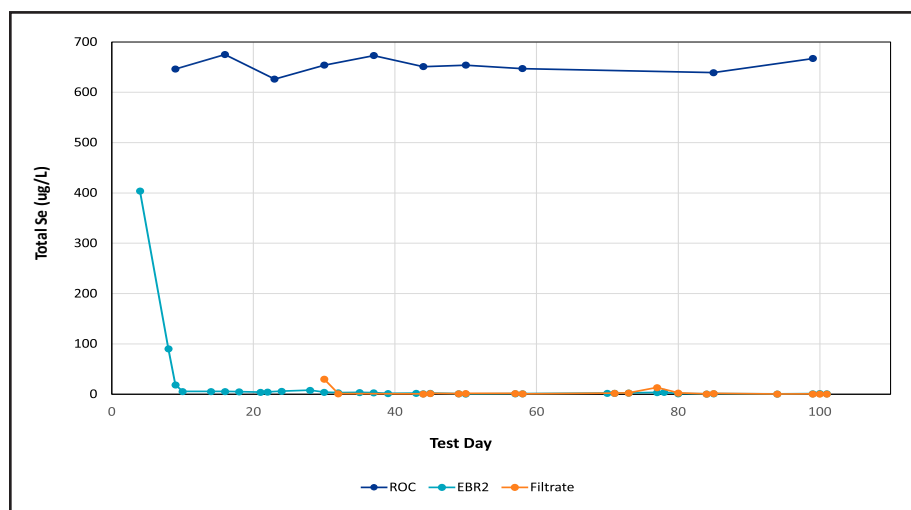


Overview

Weathering of open pit mine material releases minerals and associated trace elements like selenium into the groundwater, negatively impacting the health of downstream aquatic life. The mine utilizes reverse osmosis (RO) membrane filtration to remove selenium. WesTech piloted the Electro-Biochemical Reactor (EBR) system followed by Ultrafiltration (UF) to remove selenium from the Reverse Osmosis Concentrate (ROC) stream.

The six-month pilot demonstrated an average total selenium removal rate of 99.3%, consistently reducing the ROC concentrations of 650 µg/L to less than 5 µg/L. The nutrient requirement was low, reducing operating expenses and limiting the excess biogrowth production often experienced with conventional bioreactors. The post-treatment requirement was greatly reduced because of the low bioreactor BOD levels, no residual selenite or organo-selenium species, low phosphorus, and low turbidity. The final system design produces no liquid waste streams. ■

RESULTS



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Project Summary

RO Concentrate Water Treatment

Location:
United States

Application:
Mine Water Treatment;
Selenium Removal

Process:
Electro-Biochemical Reactor &
Ultrafiltration

Highlights

- **Fast start-up time**
- **Low chemical dosage**
- **Low biomass generation**
- **Low power requirements**
- **Selenium precipitated in a stable elemental form**
- **Simplified post-treatment requirements**
- **No liquid waste discharge**
- **Selenate the predominant species in the effluent**