

# SELENIUM AND NITRATE REMOVAL FROM COAL-MINING SEEPAGE WATERS



## Overview

Elevated nitrate and selenium concentrations are problematic and ubiquitous in coal mining environments. Weathering of coal mine waste rock releases minerals and associated trace elements like selenium. Nitrogen species are also commonly found in association with coal-mining drainages, leaching from the residual blasting compounds.

On-site pilot-scale Electro-Biochemical Reactor (EBR) systems were used to treat five British Columbia coal mine drainage waters. Influent selenium concentrations, averaging 35 µg/L to 531 µg/L, were removed to less than 1.5 µg/L. Varied levels of nitrate-N (11 mg/L – 170 mg/L) were removed to less than 2 mg/L. The test data demonstrated that the EBR technology is an effective treatment option for coal-mining waters. ■

## RESULTS

	Parameter	Average Influent	Average Effluent
Water A	NO <sub>3</sub> -N [mg/L]	170	<0.1
	Se [µg/L]	186	1.2
Water B	NO <sub>3</sub> -N [mg/L]	16.4	<0.1
	Se [µg/L]	35.0	1.4
Water C	NO <sub>3</sub> -N [mg/L]	37.0	1.0
	Se [µg/L]	531	1.4
Water D	NO <sub>3</sub> -N [mg/L]	11.0	<0.1
	Se [µg/L]	355	1.2
Water E	NO <sub>3</sub> -N [mg/L]	50.0	2.0
	Se [µg/L]	105	0.5

## Project Summary

### Coal-Mining Drainage Water Treatment

#### Location:

British Columbia, Canada

#### Application:

Mine Water Treatment;  
Nitrate and Selenium Removal

#### Process:

Electro-Biochemical Reactor

## Highlights

- **WesTech's Electro-Biochemical Reactor**
- **Low chemical dosage**
- **Low power requirements, suitable for remote drainage ponds**
- **Selenium precipitated in a stable elemental form**
- **Nitrate converted into harmless nitrogen gas**
- **Consistent contaminant removal to below the discharge targets**
- **No concentrated waste brine produced**

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