

Fact Sheet: Elk Valley Water Quality Plan



Fording River South Active Water Treatment Facility

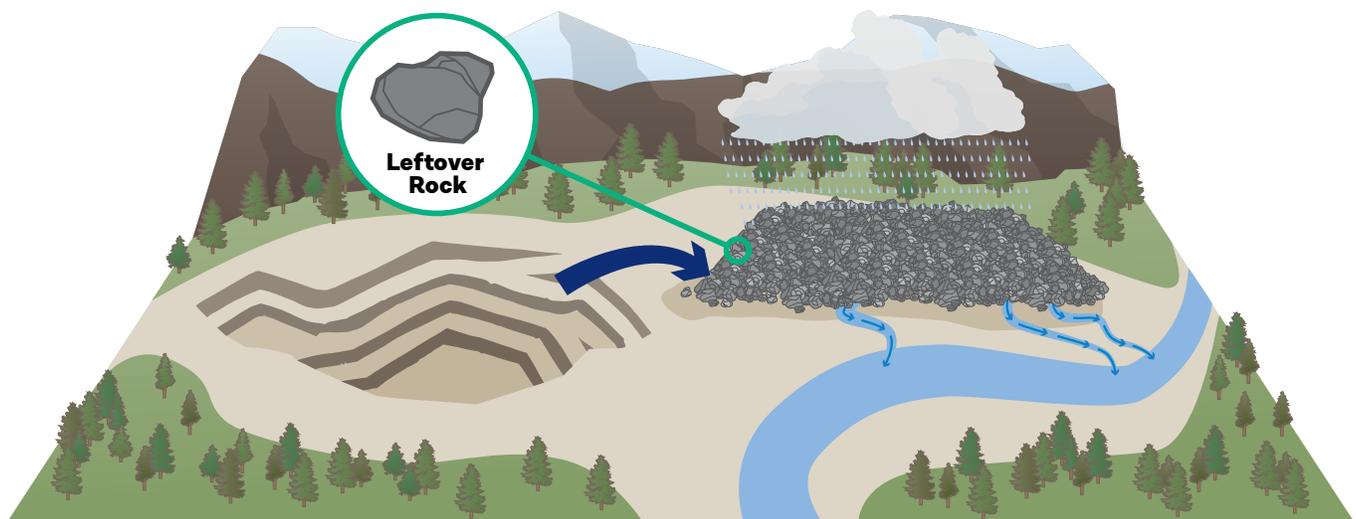
Teck is implementing the Elk Valley Water Quality Plan (EVWQP), a long-term approach to address the management of selenium and other substances released by mining activities in the Elk Valley.

The Challenge

Water quality challenges in the Elk Valley are connected to the long history of mining in the region. The mining process generates large quantities of leftover rock that contains naturally-occurring substances such as selenium, an element that is essential for human and animal health in small amounts. Water from both precipitation and runoff flows through these rock piles and carries selenium and other substances, such as nitrate, into the local watershed. If present in high enough concentrations in the watershed, these substances can adversely affect aquatic health.

Another challenge we are facing is the buildup of calcite. Calcite is a hard mineral that can form on streambeds. It is the same as the buildup that forms in tea kettles or water heaters in homes with hard water.

Calcite occurs naturally, but its formation can be accelerated by runoff water from mines. It is not a human health concern, but excessive calcite build-up can change the characteristics of streambeds by cementing rocks together and affecting habitat for fish and invertebrates.



Developing the Elk Valley Water Quality Plan

In 2013, in consultation with the Government of BC, the Ktunaxa Nation, scientists, and local communities, Teck developed the Elk Valley Water Quality Plan, which was approved by the Provincial Government in 2014.

This is a long-term plan with the goal of stabilizing and reversing the trend of selenium, calcite and other constituents and improving the health of the watershed, while at the same time allowing for continued sustainable mining in the region.

The Plan establishes short, medium and long-term water quality targets for selenium and other mine-related constituents to protect the environment and human health, as well as a plan to manage calcite formation.

To achieve the objectives of the plan, we're undertaking extensive monitoring, research and development, and building and implementing water treatment to remove selenium, calcite and other constituents from the watershed.

Implementing the Elk Valley Water Quality Plan

Teck has made significant progress implementing the Elk Valley Water Quality Plan. Water treatment facilities are operating now that are successfully improving water quality with more facilities planned and under construction.

Our **first water treatment facility** is successfully treating **7.5 million litres** of water per day at our Line Creek Operations and we are seeing reductions in selenium and nitrate concentrations downstream.

Our **second water treatment facility**, the Elkview Saturated Rock Fill, has been achieving near complete removal of selenium and nitrate from up to 10 million litres of water per day since 2018. In 2020, this Saturated Rock Fill was expanded and is now successfully treating up to **20 million litres** of water per day.

Our **third water treatment facility**, the Fording River South Water Treatment Facility, is now operating with capacity to treat up to **20 million litres** of water per day.

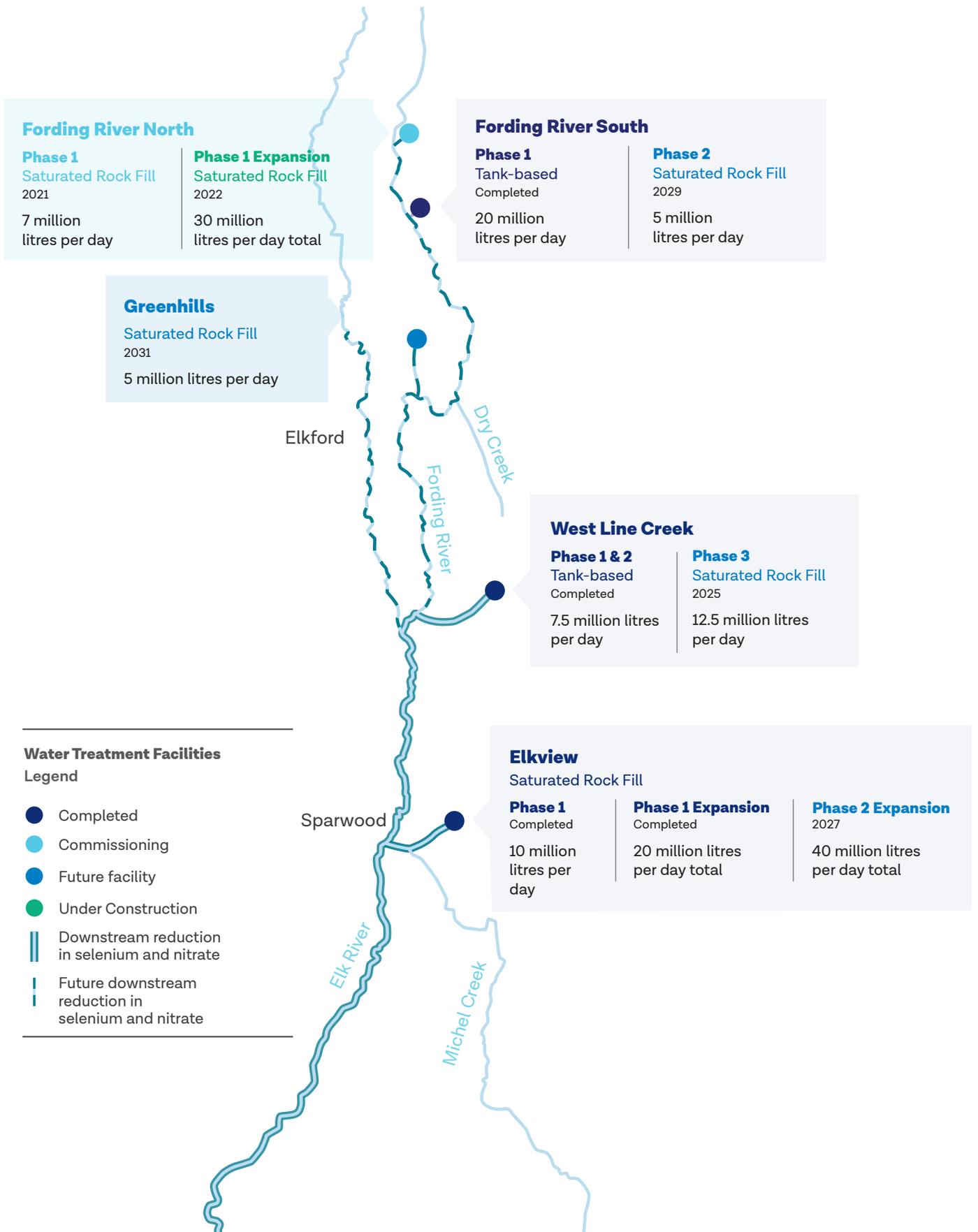
Our **fourth water treatment facility**, the Fording River North Saturated Rock Fill, is currently commissioning with expected initial capacity to treat up to 7 million litres of water per day. Construction is underway to expand this facility to **30 million litres** of water per day later in 2022.

Teck's water treatment facilities are achieving approximately **95% removal of selenium and nitrate** from treated water. We expect further significant reductions of selenium and nitrate as additional facilities come online.

Teck now has up to **47.5 million litres per day** of water treatment capacity in the Elk Valley. After completion of the Fording River North Saturated Rock Fill water treatment facility later this year, Teck will have capacity to treat up to **77.5 million litres of water per day, a four-fold increase from its treatment capacity in 2020**. With the additional capacity, Teck expects to achieve one of the primary objectives of the Elk Valley Water Quality Plan: **stabilizing and reducing the selenium trend in the Elk Valley**.



Progress building water treatment facilities



Increasing water treatment capacity



Progressing treatment and remediation for calcite

Teck has built five treatment facilities that are using proven, effective and safe antiscalant-based calcite mitigation technology that prevent further spread of calcite formations to maintain good substrate quality in tributaries and rivers downstream of mining.

Teck has been installing this technology on tributaries and we expect these installations will neutralize significant sources of calcite to the Fording River, such as Swift, Cataract, Kilmarnock, and Greenhills Creeks and Dry Creek at our Line Creek Operations.

Further to calcite precipitation mitigations, Teck is also working towards calcite remediation to restore habitat.

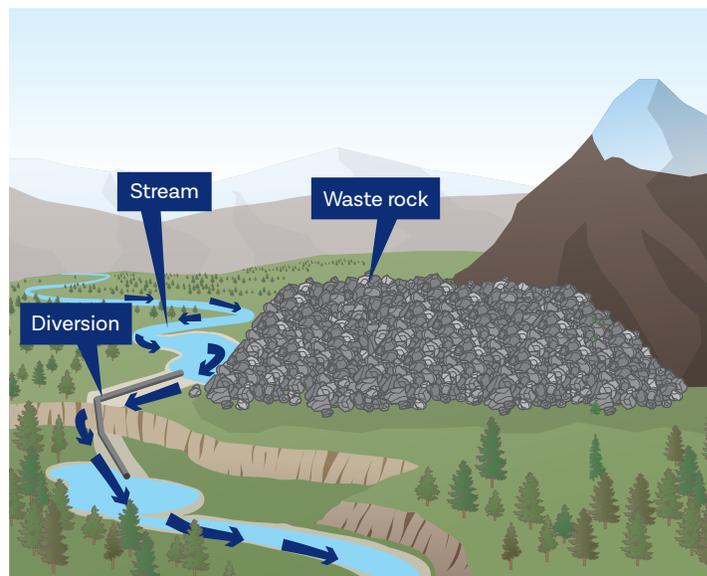
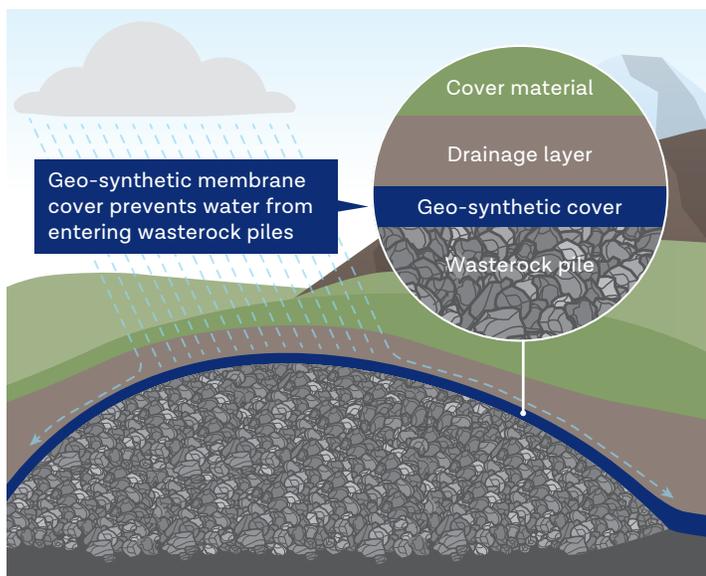
Teck is planning remediation of an approximately 250-metre-long section of Greenhills Creek which will pilot a methodology to implement the broader vision of habitat restoration work for this tributary and for calcite remediation in mine-affected tributaries valley-wide.



One of five treatment facilities to prevent further spread of calcite formations.

Implementing source control

As part of the Elk Valley Water Quality Plan, Teck is researching and implementing methods to control selenium release at the source.



Geo-synthetic Covers

Geo-synthetic covers are low permeability synthetic membrane barriers placed over top of a waste rock pile to reduce water percolating through waste rock and carrying selenium and nitrate into the watershed.

We are currently working towards the installation of a 200-hectare geo-synthetic cover trial in the Greenhills creek drainage by 2030.

The headwaters of Greenhills Creek have been identified as the location where a geo-synthetic cover over waste rock has the greatest technical potential as a source control measure.

If the cover trial is successful, there may be potential for geo-synthetic covers to be deployed in a limited number of other specific settings in the Elk Valley to supplement other source control measures already under development.

This visual helps show how the cover acts as a barrier to prevents rain and snow melt from flowing through the waste rock pile.

Water Diversions

Clean water diversions can reduce the volume of water affected by waste rock, thereby reducing the amount of water that needs to be treated.

This involves the construction of earthen dikes, channels or other physical barriers and/or pipes to direct clean water around mining activities.

Monitoring

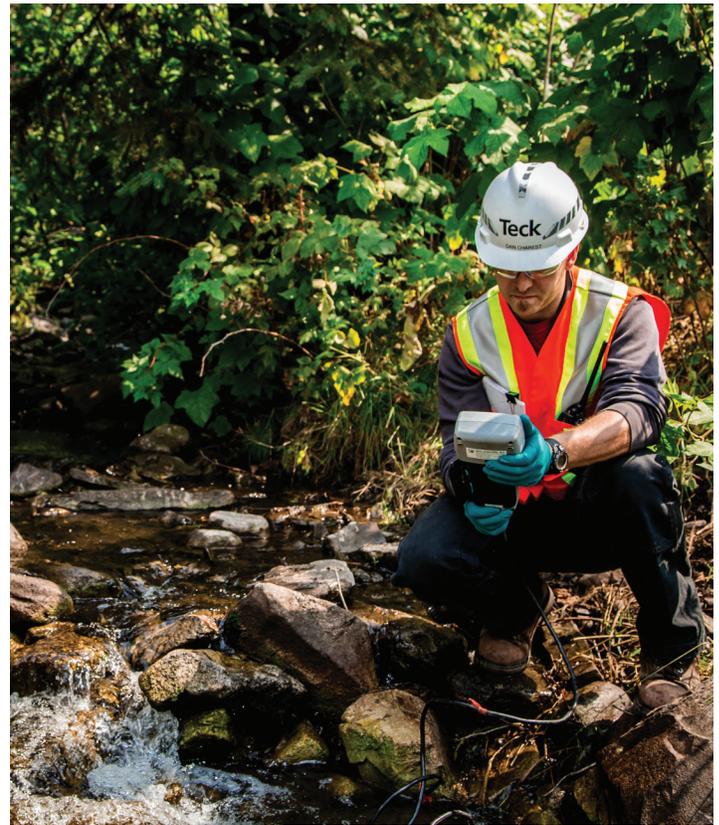
We are conducting extensive studies and monitoring of water quality and aquatic health, which includes regular water quality monitoring at more than 130 locations in the Elk Valley.

Monitoring shows that selenium concentrations have been reduced downstream of our water treatment facilities at Line Creek and Elkview, and we expect further significant reductions as the new Fording River facilities come online.

Sharing Monitoring Results

Teck is committed to being transparent with stakeholders as we implement the Elk Valley Water Quality Plan. We make data and results from ongoing water quality, aquatic and animal health research and monitoring undertaken as part of the Plan available, and we will continue to share those results going forward. This includes Annual Reports completed by an Environmental Monitoring Committee comprised of an independent scientist and representatives from the B.C. Government, Ktunaxa Nation Council, Interior Health Authority, and Teck.

Monitoring reports related to the Elk Valley Quality Plan can be found at: teck.com/elkvalley



Research and Development

The Elk Valley Water Quality Plan includes the adoption of new technologies and management approaches as further advancements in technology are achieved through this program.

Teck has undertaken a comprehensive research and development program that has led to the development of breakthrough technologies including:

- Saturated Rock Fill technology to treat mine-impacted water that is achieving near complete removal of selenium and nitrate.
- Development of a new nitrate management technique that uses liners that prevent explosives with nitrate from coming in contact with water. This technique has been applied across our operations in the Elk Valley, and the majority of blast holes now utilize a liner that prevents nitrate from entering the watershed, protecting water quality

Teck has more than 25 research and development projects underway, including the advancement of smaller, in-situ water treatment facilities that can be built closer to where treatment is needed.

Teck's use of saturated rock fills to treat mine-affected water is leading-edge sustainable technology. Saturated rock fill is extremely effective at removing selenium and nitrate from mine affected water and improving water quality.

Dr. Lisa Kirk, an affiliate professor in Montana State University's Department of Chemical and Biological Engineering, who helped develop saturated rock fill technology.

Investments

To date, we have spent \$1.2 billion to implement the Elk Valley Water Quality Plan.

Between 2022 and 2024 we plan to invest up to a further CAD\$750 million in work to protect the watershed.

For more information

Visit teck.com/elkvalley

