

# Water Stewardship



Pictured above: Desalination plant at the Quebrada Blanca Phase 2 project, Chile.

# Water Stewardship

Water is an essential resource for people, communities and the environment. Natural resource crises, including water, are among the top 10 global risks identified by the World Economic Forum's 2021 Global Risks Report.<sup>22</sup> Additionally, the Intergovernmental Panel on Climate Change reports that climate change will be accompanied by significant changes to the water cycle, further intensifying extreme weather events and contributing to water scarcity.<sup>23</sup>

Water is also a critical input to the mining process, used in several activities including mineral processing, dust suppression and employee use. Mining can affect both the availability and the quality of water in surrounding environments, which requires careful planning and mitigation actions to minimize these impacts. The mining industry has developed innovative ways to demonstrate leadership in water stewardship by collaboratively managing water as a shared resource throughout the mining cycle.

Teck recognizes that water is essential to communities in the watersheds where we operate, that access to water is a fundamental human right and that responsible water management is essential to maintaining trust. We work to protect water quality downstream of our operations, improve water use efficiency, and engage with stakeholders and Indigenous Peoples on watershed management wherever we operate. To address risks related to water scarcity in regions such as Chile, we have developed a strategic priority to transition to seawater or low-quality water sources for all

operations in water-scarce regions by 2040. In 2021, we advanced construction of a desalination plant at our Quebrada Blanca Phase 2 (QB2) project, which will allow us to avoid using fresh water in this water-scarce region.

In 2021, we continued to implement the Elk Valley Water Quality Plan at our steelmaking coal operations in southeast British Columbia. We completed the Elkview Saturated Rock Fill (EVO-SRF) Phase 2, the Fording River South Active Water Treatment Facility (FRO-S AWTF), and the Fording River North Saturated Rock Fill (FRO-N SRF) Phase 1. By the end of 2021, we had capacity to treat up to 47.5 million litres of water per day. For more information, see the Managing Water Quality in the Elk Valley section on page 50, as well as page 22 of our [2021 Annual Report](#).

In 2021, we also aligned our reporting against the Mining Association of Canada's Towards Sustainable Mining (MAC TSM) [Water Stewardship Protocol](#), and achieved a minimum of AA performance at our Canadian operations.

## GRI Indicators and Topic Boundary

102-34, 303-103, 303-1, 303-2, 303-3, 303-4, 303-5, 306-3, 307-1

This topic is considered one of the most material by our shareholders, employees, local communities, regulators and society in the context of Teck's operations.

## How Does Teck Manage This Topic?

Information about how we steward water, including relevant policies and our management practices and systems, is available for [download on our website](#).

<sup>22</sup> The [Global Risk Report 2021](#). World Economic Forum. 2021. <sup>23</sup> [Climate Change 2021: The Physical Science Basis](#). IPCC. 2021.

## 2021 Highlights

# 3.1

the number of times water is reused and recycled on average at mining operations

Completed construction of **three water treatment facilities** – the Elkview Saturated Rock Fill (SRF) Phase 2, the Fording River South Active Water Treatment Facility and the Fording River North SRF Phase 1; by the end of 2021, we had capacity to **treat up to 47.5 million litres of water per day**

Advanced the construction of a **seawater desalination facility at our Quebrada Blanca Phase 2 (QB2) project** in preparation for first copper production in the second half of 2022

## Our Performance in Water Stewardship in 2021

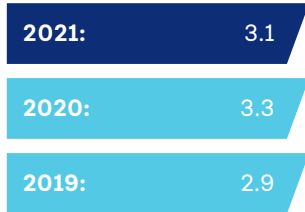
**Our Targets and Commitments** Teck is committed to responsible management of water resources, and to protecting water quality and water access where we operate. The following table summarizes our performance against our sustainability strategy and goals for water stewardship.

Sustainability Strategy Goals	Status	Summary of Progress in 2021
Strategic Priority: Transition to seawater or low-quality water sources for all operations in water-scarce regions by 2040		
<b>Goal:</b> By 2025, design all development projects in water-scarce regions with a seawater or low-quality water source.	On track	Advanced the construction of a seawater desalination facility at QB2. Construction of the facility is expected to be completed by the second half of 2022.
Strategic Priority: Implement innovative water management and water treatment solutions to protect water quality downstream of our operations		
<b>Goal:</b> By 2025, implement new source control or mine design strategies and water treatment systems to further advance efforts to manage water quality at our operations.	On track	<p>Advanced source control mine design strategies at our steelmaking coal operations including advancing construction of a suboxic zone within a spoil at Fording River as well as a clean water diversion at Fording River.</p> <p>Continued to improve nitrate source control from blasting at our steelmaking coal operations. In our base metals operations, we began construction of a waste stockpile cover at Red Dog Operations (RDO).</p> <p>Completed construction or expansion of three water treatment facilities at our steelmaking coal operations. By the end of 2021, our treatment capacity increased from 17.5 million litres per day to up to 47.5 million litres per day.</p> <p>Commissioned a new reverse osmosis water treatment plant at RDO to improve water discharge and to adapt to the changing climate.</p>

## Performance Metrics

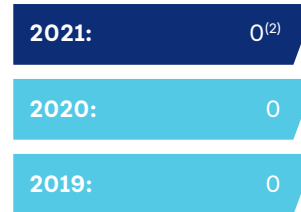
### Indicator

Number of times water was reused and recycled at mining operations



### Indicator

Significant<sup>(1)</sup> water-related incidents



- (1) Teck uses a risk management consequence matrix to determine incident severity, which includes environmental, safety, community, reputational, legal and financial aspects. "Significant incidents" includes incidents assessed as Level 4 or Level 5 based on our risk matrix and guidance.
- (2) The fish decline in the Upper Fording River is not classified as a significant water-related incident in accordance with our incident reporting system, as it has not been connected to a specific incident under our control. However, the decline is a significant event that Teck is taking very seriously, and we are fully committed to a thorough and extensive evaluation of cause and implementation of the comprehensive recovery plan.

## Managing Water Quality in the Elk Valley

In 2021, we continued to implement the Elk Valley Water Quality Plan (the Plan), a long-term approach to address the management of selenium and other substances released by mining activities in the Elk Valley. The Plan was approved in 2014 by the B.C. Minister of Environment and developed in cooperation with governments in Canada and the U.S. as well as with Indigenous groups, communities, independent scientific experts and others. The goal of the Plan is to stabilize and reverse the trend of mine-related substances and to maintain the health of the watershed while allowing for continued sustainable mining in the region where our steelmaking coal operations are located. The Plan is among the largest water quality management programs in the world, and Teck is making significant progress in advancing the Plan and protecting water quality in the Elk Valley.

The Plan establishes short-, medium- and long-term water quality targets, which are protective of the environment and human health, for selenium, nitrate, sulphate and cadmium, as well as a plan to manage calcite formation. In 2021, we continued to implement a range of practices and mitigation projects as part of the Plan, including increasing our overall total treatment capacity up to 47.5 million litres per day. See more details in the case study on page 50 and the Water Treatment Facilities section on page 51.

To date, we have spent more than \$1.2 billion so far to implement the Plan; between 2022 and 2024, we plan to invest up to a further \$750 million in work to protect the watershed. For information on our management of water quality in the Elk Valley, see page 22 of our 2021 Annual Report and [our website](#).

### Case Study: A Big Year for Water Quality Management in the Elk Valley

Teck marked significant milestones in our work to implement the Elk Valley Water Quality Plan (EVWQP), a long-term approach to maintain the health of the watershed in the area of our B.C. steelmaking coal operations. In 2021, our work included completing two key projects: the Elkview Saturated Rock Fill expansion, and the Fording River South Active Water Treatment Facility. In addition, we completed construction of phase 1 of the Fording River North Saturated Rock Fill

facility. In 2022, we expect to increase capacity to treat more than 77.5 million litres of water per day — with expected significant reductions in selenium and nitrate concentrations throughout the watershed. Looking to 2022 and beyond, we plan to further increase water treatment capacity, as we work closely with our communities and partners to protect this vital resource. Read the full case study at [teck.com/news/stories](https://teck.com/news/stories).

## Monitoring Aquatic Health

Teck conducts ongoing aquatic health studies and monitoring in the Elk Valley and makes these reports public to help advance community knowledge and scientific understanding. This includes regular water quality sampling at more than 130 locations across the Elk Valley. Monitoring shows that selenium concentrations have been reduced downstream of our water treatment facility at Line Creek Operations (LCO). We expect more significant reductions in selenium concentrations as treatment capacity is ramped up in 2022.

As reported previously, monitoring conducted for Teck in the fall of 2019 found that the abundance of westslope cutthroat trout (WCT) adults and sub-adults in the upper Fording River had declined significantly since previous sampling in fall 2017. In 2021, however, 796 fish were observed, compared to approximately 170 in 2019, indicating a positive trend in recovery.

Teck established an Evaluation of Cause team of external experts to investigate and report on the possible causes of the 2019 fish count decline. The Evaluation of Cause team found that the upper Fording River fish population decline happened in the winter of 2018/2019 and was caused by the interaction of extreme ice conditions (due to extreme prolonged cold air temperatures, seasonal winter low flows and low winter snowpack), sparse overwintering habitats and restrictive fish passage conditions during the preceding migration period in fall 2018. While some stressors such as cold weather are natural, mining development has altered the availability of overwintering habitats in portions of the river and exacerbated the challenges to fish passage through water use, channel widening and aggradation. The findings indicate water quality constituents, including selenium, were not a primary contributor to the decline. The final Evaluation of Cause Report and supporting technical reports can be found on [our website](#). Monitoring is ongoing and 2021 fish survey results indicate a positive trend in the WCT population. The study team is currently evaluating the data for the 2021 monitoring reports and once finalized will be publicly available in 2022.

In 2021, we continued to develop and implement a comprehensive fish recovery strategy for the Upper Fording River in collaboration with the Province and the Ktunaxa Nation Council. Teck's fish recovery plans are being built around three pillars: fish habitat, water quality and water quantity. Since 2019, we have worked to rehabilitate approximately 40,000 square metres of fish habitat along 5 kilometres of the upper Fording River and we have reconnected 14 kilometres of tributary habitat. This work included creating overwintering pool habitat, adding woody debris, improving fish passages and planting over 45,000 seedlings across 21 hectares to improve riparian areas, in addition to limiting water use during low-flow periods and increased monitoring.

In a separate watershed (which includes Harmer and Grave creeks), results of WCT population monitoring indicated that

a negligible number of individuals were added to the WCT population in 2018 and 2019 in Harmer Creek. The 2021 monitoring documented the presence of two- and three-year old fish, indicating complete recruitment failure did not occur, and new recruits are present. The abundance of adult WCT in the Harmer Creek population has remained comparatively small but stable, throughout both the historical period and recent years. A team of qualified professionals is working through available information to determine recruitment challenges in this system to inform future watershed planning and habitat improvement projects.

Annual reports about our ongoing monitoring programs, which are prepared by professional scientists, reflect data generated since the Elk Valley Water Quality Plan was approved. The reports have been reviewed by the Environmental Monitoring Committee (EMC), a group that provides science-based and Ktunaxa traditional knowledge advice and input to Teck, and to the B.C. Ministry of Environment and Climate Change Strategy regarding monitoring designs and reports in the Elk Valley. The EMC includes representatives from the Ministry of Environment and Climate Change Strategy; Ministry of Energy, Mines and Low Carbon Innovation; Ktunaxa Nation Council; Interior Health Authority; an independent scientist; and Teck. Read the 2021 EMC Report available at <https://www.teck.com/media/2021-EMC.pdf>

## Water Treatment Facilities

We increased our treatment capacity through the construction of active water treatment facilities (AWTFs) and through the successful implementation of our innovative saturated rock fill (SRF) technology, a nature-inspired water treatment solution that effectively removes compounds such as selenium and nitrate from water.

By the end of 2021, Teck's water treatment facilities in the Elk Valley included:

- Our first facility, West Line Creek Water Treatment Facility, successfully treating up to **7.5 million litres** of water per day
- Our second facility, Elkview Saturated Rock Fill, successfully treating up to **20 million litres** of water per day
- Our third facility, Fording River South Water Treatment Facility, treating up to **20 million litres** of water per day

By the end of 2021, we had capacity to treat up to 47.5 million litres of water per day. Additionally, in 2021 we completed construction and began commissioning the first phase of our fourth facility, the Fording River North Saturated Rock Fill (FRO-N SRF). This facility is being expanded to 30 million litres of water treatment capacity per day in 2022.

By the end of 2022, Teck will have 77.5 million litres per day of treatment capacity installed— more than quadruple our treatment capacity in 2020 of 17.5 million litres per day. With treatment capacity ramping up this year, we expect to achieve one of the primary objectives of the Elk Valley Water Quality plan - stabilizing and reducing the selenium trend in the Elk Valley and Kooecanusa.

We also commissioned a clean water diversion structure at Fording River Operations (FRO) that will reduce the volume of water affected by waste rock.

### Reducing Nitrate in Blasting

Our comprehensive research and development program has led to the creation of a new nitrate prevention technique that uses liners that prevent explosives with nitrate from coming into contact with water, which significantly reduces the amount of nitrate in the environment. This technique was successfully piloted in 2019 at our steelmaking coal operations. In 2021, we deployed liners in 92% of all holes at our steelmaking coal operations. We continue to work towards a target of having 95% of all explosives being placed into lined holes at our steelmaking coal operations.

### Research and Development

Teck is focused on continued research and development to improve water quality in the short and long term. Examples of this work include:

- **Source control:** Aggressively pursuing the use of source control technologies in our mined rock facilities, and constructing mined rock facilities to limit air entry and the

corresponding natural reactions that generate constituents of interest; in 2021, we advanced our first example of this technology at Cedar North at Elkview Operations

- **Alternative water treatment technologies:** Exploring the use of smaller in situ water treatment facilities that can be built much closer to where treatment is needed, and evaluating emerging treatment technologies that target mine water constituents of interest
- **Mined rock covers:** Evaluation of different forms of covers, ranging from vegetative to geomembrane covers, for mined rock piles
- **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; we are assessing the contribution of diversions to water quality performance through the construction and monitoring of the Kilmarnock Creek Diversion at Fording River Operations (FRO), which was commissioned in 2021

Capital spending on water treatment (AWTFs and SRFs) and water management (source control, calcite management and tributary management) was \$226 million in 2021.

## Community Engagement on Water

Access to clean and sufficient water by users in our areas of influence is important to us and to our stakeholders. When implementing our water management practices, we consider and engage with other water users in the watersheds where we operate. In 2021, we engaged with local communities and

Indigenous Peoples on water management, including our work in the Elk Valley on water quality, as well as on key projects such as QB2, the proposed Highland Valley Copper 2040 project and the proposed Fording River Extension project.

## Improving Water Efficiency

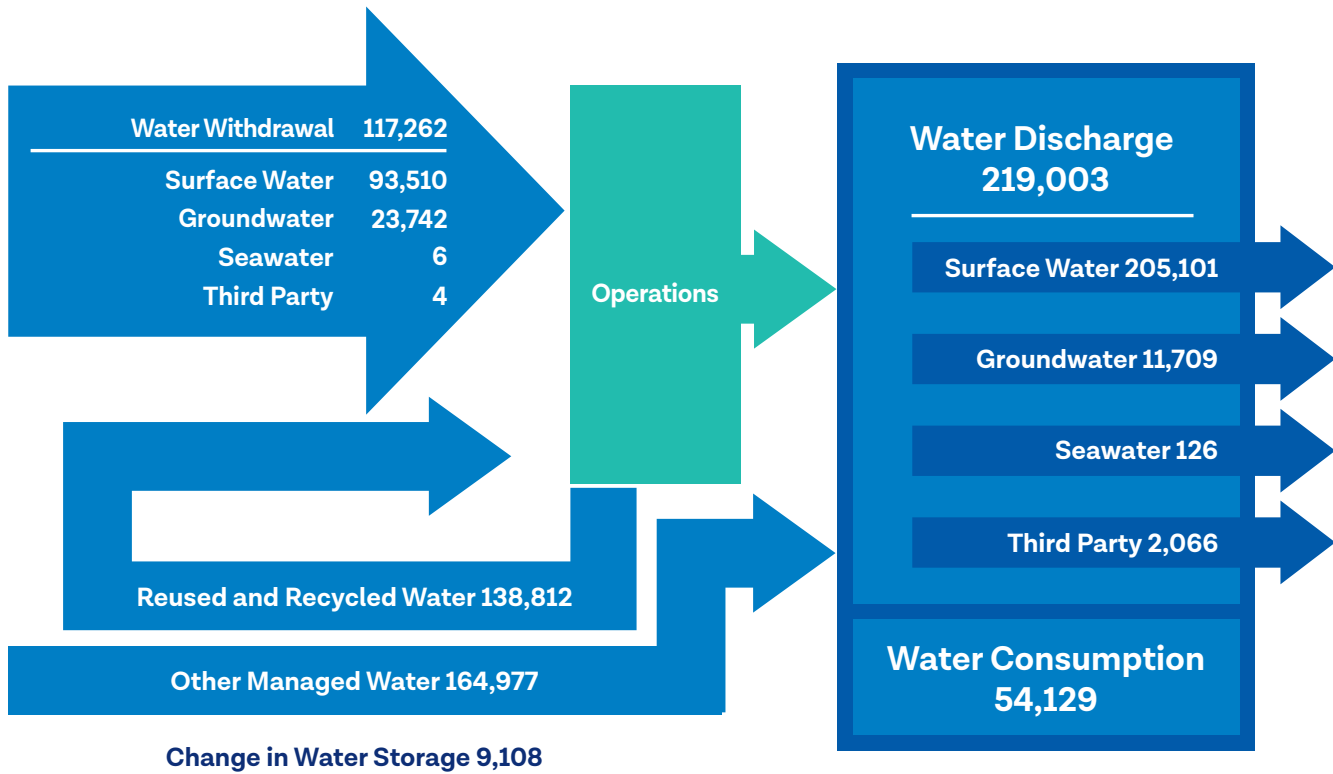
We monitor water data at all of our operations and incorporate the data into scenario planning using site-wide water balances.<sup>24</sup> The company-wide water balance (Figure 17) is the aggregation of all of the site-wide water balances. This water balance is complex due to the variability of natural factors such as rainfall, snowmelt, and the diversity of the climates and geological conditions where our operations are located. Understanding our site-wide and company-wide water balances is key to improving water management practices and to enabling better decision-making.

In 2018, we updated our water data collection and reporting to align with the ICMM's *A Practical Guide to Consistent Water Reporting*. Our detailed water data is provided in our [2021 Sustainability Performance Data](#).

At Teck, we use water primarily for material processing and transport, cooling and dust control. A portion of the water we use is consumed through entrainment in our products and tailings or through evaporative processes. The water we use is typically obtained from where our operations interface with surface water and groundwater systems, and we are transitioning to seawater sources in water-scarce regions such as northern Chile. We manage and discharge a significant amount of water without use, and we discharge this water as close as practical to the source location. The water we discharge is monitored and treated where necessary.

<sup>24</sup> Site-wide water balances provide an understanding of water withdrawals, consumption, reuse/recycle and discharge volumes at each operation. Water balances are developed using a mix of measurements and modelling computation.

Figure 17: Company-Wide Operational Water Balance – Megalitres (ML)



**Water withdrawal:** All water that enters the operational water system and is used to supply the operational water demands.

**Other managed water:** Water that is actively managed without intent to supply the operational water demands.

**Water discharge:** Water that is released back to the water environment or to a third party.

**Water consumption:** Water that is permanently removed, by evaporation, entrainment (in product or waste) or other losses, and not returned to the water environment or a third party.

**Reused and recycled water:** Water that has been used in an operational task and is recovered and used again in an operational task, either without treatment (reuse) or with treatment (recycle).

**Change in water storage:** The net change (positive or negative) in the volume of water stored over the accounting

period; a positive number indicates water accumulation, and a negative number indicates water reduction.

**Types of Water**

**Surface water:** Water from precipitation and runoff that is not diverted around the operations; includes water inputs from surface waterbodies that may be located within the boundaries of our operations.

**Groundwater:** Water from beneath the earth’s surface that collects or flows in the porous spaces in soil and rock that is not diverted around the operations.

**Third-party sources:** Water supplied by an entity external to the operation, such as from a municipality; we do not use wastewater from other organizations.

**Seawater:** Water obtained from a sea or ocean.

In 2021, the number of times water was reused and recycled, expressed as the ratio of water reused and recycled to water withdrawals, was 3.1 at our mining operations. This means that we reused the same water approximately 3.1 times on average before treating and returning it to the environment.

Trail Operations accounts for 61% of our water withdrawals. Almost all the water used at Trail Operations is for cooling purposes, meaning that it does not come into contact with

chemicals or reagents, and the only change it undergoes is a slight increase in temperature before being returned to the environment within regulatory-approved conditions. In 2021, our water withdrawals were nearly the same as in 2020. Our total water consumption in areas with water stress<sup>25</sup> was 11,149 ML in 2021. Additional water data is provided in our [2021 Sustainability Performance Data](#).

<sup>25</sup>Water-stressed areas lack the ability to meet human and ecological demands for fresh water. Water stress components include water availability, quality and accessibility. The proportion of sites in water-stressed areas is 25%.

**Table 14: Water Withdrawals and Water Reused and Recycled – Megalitres (ML)**

All operations	2021	2020	2019	2018
Water withdrawals (ML)	117,262	118,284	127,018	128,146
Water reused/recycled (ML)	138,812	157,641	148,914	174,688
<b>Mining operations</b>				
Water withdrawals (ML)	45,222	47,739	51,954	60,003
Water reused/recycled (ML)	138,812	157,641	148,914	174,688
Number of times water is reused and recycled (ratio of reused/recycled and withdrawals)	3.1	3.3	2.9	2.9

## Technology and Innovation

In 2021, Teck implemented several initiatives across our organization to improve water use, monitoring and efficiency.

At Carmen de Andacollo (CdA) we conducted field trials to evaluate the use of additives to reduce the water content of the tailings discharged into the facility. This will lower the amount of water in the tailings facility, which reduces the amount of water lost to evaporation, and ultimately leads to the reduction of overall site water consumption.

Teck gained water monitoring efficiencies at CdA and FRO. At CdA, we digitized the operational water balance to enable near real-time optimization of water use and flows, and increased the number of sensors installed in the field. At FRO, we advanced development of a digital tool that displays real-time water quality and flow rate results that are used by the operation to inform water management decisions.

Also see the Technology and Innovation section on page 45 in the Tailings Management chapter for more details on projects being implemented at our steelmaking coal sites.

## Water-Related Compliance

### Non-Compliances and Significant Water-Related Incidents

We continue to implement the water quality improvement measures identified in the Elk Valley Water Quality Plan. The pace of construction of some of the water treatment facilities was hindered by challenges related to the treatment technology and, more recently, as a result of the COVID-19 pandemic. Partly due to the slower-than-anticipated pace of construction, we have recorded non-compliances in relation to certain permit limits in the Elk Valley. To address these non-compliances, we are aggressively advancing construction of several water treatment facilities and we are implementing other water quality improvement measures in parallel, such as reducing nitrate from blasting, and accelerating research and development projects in the areas of source control, water diversions and mine rock cover systems.

We assess the severity of environmental incidents based on the potential environmental, safety, community, reputational and financial impacts. Based on our incident severity criteria, there were no significant water-related incidents in 2021.

### Litigation

Teck continues studies under the 2006 settlement agreement with the U.S. Environmental Protection Agency (EPA) to conduct a remedial investigation on the Upper Columbia River in Washington state. The Lake Roosevelt litigation involving Teck in the Federal District Court for the Eastern District of Washington continues. In December 2012, on the basis of stipulated facts agreed between Teck and the plaintiffs, the Court found in favour of the plaintiffs in phase one of the case, issuing a declaratory judgment that Teck is liable under the *Comprehensive Environmental Response, Compensation, and Liability Act* for response costs, the



amount of which will be determined in later phases of the case. A hearing with respect to natural resource damages and assessment costs is expected to follow completion of the remedial investigation and feasibility study being undertaken by Teck. For more information, see pages 111–113 of our [2021 Annual Information Form](#).

### **Charges, Fines and Penalties**

In March 2021, Teck Coal resolved charges under the *Fisheries Act* relating to discharges of selenium and calcite in 2012 to a mine settling pond and to the Fording River from our Fording River and Greenhills operations in the Elk Valley. As part of the resolution, Teck Coal was assessed total penalties of \$60 million for the two offences. The Crown will not proceed with charges relating to the same discharges over the period from 2013 to 2019.

Teck Coal received a fine of \$40,000 in May 2021 for failing to maintain minimum flow requirements at Dry Creek at

our Line Creek Operations, which resulted in the death of 26 westslope cutthroat trout. A formal Incident Cause Analysis Method (ICAM) investigation was completed, resulting in several recommendations that have been or are being implemented to improve risk management for water operations and construction works.

Teck Coal received a fine of \$120,000 in March 2021 for *Daphnia magna* toxicity breaches of the Elk Valley Regional Environmental Permit associated with calcite buildup in some Elk Valley waterways. As part of ongoing implementation of the Elk Valley Water Quality Plan, Teck Coal focused research and development activities on identifying a technology to prevent calcite precipitation in the waterways. Based on this research, Teck Coal has now successfully installed calcite prevention treatment at multiple locations.