



### INFORMATION BULLETS

**DATE:** July 20, 2022

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**ISSUE:** Water Quality (WQ) in the SE Coal Block: mitigation history, current state of the environment, and compliance & enforcement

#### SUMMARY AND KEY MESSAGES:

- The Area Based Management Plan (ABMP) seems to be generally working:
    - The plan is driving significant investment in WQ mitigation measures and provides a strategy for adaptively managing cumulative effects.
    - Schedule delays for the Active Water Treatment Facility (AWTF) at Fording River Mine have been a challenge, resulting in significant continuing localized non-compliances for the past 3yrs; however, the facility has now been commissioned and treatment capacity in the valley continues to increase as more facilities come online.
    - Based on updated models and improved science, Teck is predicting full compliance with current ABMP targets by 2028.
  - Even with full compliance, the ABMP allows for localized effects in the short and medium term while working towards increased protection and reduced risk over time.
  - ENV has been working on a proposal to update the ABMP.<sup>s.13</sup>  
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- Permitting teams will prioritize application reviews for mitigation projects or other applications that are necessary to support Teck in achieving compliance.

#### KEY FACTS:

##### Water Quality: Mitigation History & Timeline

- Decades of mining activity in the SE Coal Block of B.C. led to significant waste rock accumulation, alteration of land and watercourses, poorly understood environmental impacts and degrading water quality (WQ) trends.

- In 2014 the ENV Minister approved an Area Based Management Plan (ABMP), titled the Elk Valley Water Quality Plan, to stabilize and reduce mine-related contaminants in the watershed. The ABMP provides for regional management that allows localized environmental effects and supports trade-offs for efficient mitigation of watershed-scale impacts.
- The ABMP established short-, medium- and long-term WQ targets for Selenium (Se), Nitrate (NO<sub>3</sub>), Sulphate (SO<sub>4</sub>) and Cadmium (Cd) that range from B.C. water quality guideline levels which are fully protective (at downstream sites), to (upstream) site-specific targets at levels that exceed thresholds where effects are expected.
- ENV, Ktunaxa Nation Council (KNC) and Teck have been working in earnest to implement the ABMP since its approval.
- In 2015, the first Se (and NO<sub>3</sub>) AWTF came online at West Line Creek (WLC), treating up to 7,500m<sup>3</sup>/d. Unexpectedly, the new technology resulted in toxicity impacts and Teck experienced reduced flows and downtime when the system had to be upgraded and adjusted.
- The challenges with the WLC AWTF, compounded with construction issues and COVID, caused delays in commissioning the second AWTF at Fording River Operations South (FRO-S), which commenced almost three years late in 2021. FRO-S AWTF is now fully commissioned and is operating at full capacity, treating up to 20,000m<sup>3</sup>/d.
- In 2020, Teck expanded a full-scale pilot of Saturated Rock Fill (SRF) technology at Elkview Operations (EVO) to achieve 20,000m<sup>3</sup>/d capacity, and has continued to develop and refine this technology for widescale application throughout the Elk Valley. SRF technology is robust, requires less complex infrastructure, and has lower capital and operating costs than AWTFs.
- In early 2022, commissioning of a second SRF commenced at Fording River Operations North (FRO-N). Full operation at 30,000m<sup>3</sup>/d is expected in 2023.
- At present, the EVO SRF is operating at reduced capacity while Teck investigates the cause of unexpected elevated Se in benthic invertebrate tissue downstream of the outfall. Teck is also taking actions to reduce nickel discharge.
- Teck's Regional Water Quality Model (RWQM) is in place to support assessments, predictions, and mitigation planning. Teck is currently applying the RWQM to develop an ABMP implementation plan adjustment (IPA) which will be submitted imminently and is expected to propose 18 facilities and/or expansions and commit to treating 193,500 m<sup>3</sup>/d by 2042 to achieve ABMP targets. See Figure 1.
- To date, Teck reports investments of over \$1B implementing the ABMP, and by 2031 they will have invested close to \$2B.
- The 2022 IPA is expected to predict possible Se and NO<sub>3</sub> non-compliances at a few locations as late as 2028.
- For the first time, the 2022 IPA will include Teck's plan to address sulphate through additional treatment modules at their existing and proposed treatment facilities.
- Teck has also developed antiscalant technology to prevent calcite deposition on streambeds, is currently operating five antiscalant plants over nine tributaries, and is developing pilot projects to remediate impacted streams.
- Teck continues to invest heavily in research and development (R&D) and is at the global forefront in developing source control and treatment to mitigate coal mining impacts.

### Water Quality: Current State of the Environment

- Teck is required to monitor WQ at approximately 130 locations and conducts numerous studies to assess mine-related impacts. All this data is uploaded to a publicly accessible database quarterly.
- Monitoring shows that aquatic ecosystems in mainstems are functioning, but chronic toxicity impacts are present in some areas. Many tributaries are heavily impacted both from infill and water quality.
- Monitoring and assessment programs have not detected aquatic ecosystem impacts in the Kooconusa reservoir, despite Se levels being above the proposed Water Quality Objective (WQO) most of the time and many fish tissue samples above the conservative threshold for potential aquatic life impacts. Further species sensitivity threshold studies are underway to better understand any risks posed by Se in the reservoir.
- Studies continue to find other emerging issues, such as nickel toxicity and enhanced bioaccumulation of some forms of selenium, that are being addressed using the structured Adaptive Management Program defined in the ABMP.
- Evaluation of Cause for the Upper Fording River Westslope Cutthroat population crash of 2019 does not point to WQ as a primary factor; however, WQ combines with other mining stressors and may create vulnerability in the population.
- Teck's recently submitted comprehensive Human Health Risk Assessment concluded:
  - Selenium is the primary mine-related parameter of concern from a human health risk perspective in the Elk Valley. There is a risk to human health associated with Ktunaxa citizens eating fish at their preferred rate in all areas except the Kooconusa Reservoir. More data is needed to understand local and fish species-specific risk patterns.
  - Other mine-related parameters pose little to no risk for most designated water uses, or human consumption via food or water.
  - Exposure to mercury from eating Kooconusa reservoir fish resulted in the highest human health risk assessed in the report. However, mercury is not mine-related and concentrations in fish are consistent with concentrations from other regional lakes.
  - Implementation of water treatment technologies will continue to reduce risks to human health associated with selenium and nitrate.

### Water Quality: Compliance and Enforcement

- ENV takes a risk-based approach to compliance and enforcement activities for Teck as guided by ministry policies and procedures. In addition to those policies and procedures a 4 Year Compliance Plan has been developed with input from the Ktunaxa Nation Council (KNC). The compliance plan covers all 26 of Teck's EMA authorizations:
  - The Valley Permit has quarterly inspections on WQ results and an annual comprehensive review
  - Eight effluent permits for specific mining operations are inspected annually
  - Eighteen other authorizations for discharges to air, refuse, and explosives are inspected at least once every four years

- KNC is provided with quarterly compliance updates and all inspection records. They also have an opportunity to provide input to the statutory decision maker to consider when reviewing Administrative Penalties (AP), prior to a final determination on the AP.
- In 2021 most WQ data at compliance points was in compliance, except at three sites: Line Creek had only 25% compliance for monthly NO<sub>3</sub> (but 100% for Se); Upper Fording River had 33% compliance for NO<sub>3</sub> and 42% compliance for Se (both related primarily to delays in FRO-S AWTF); and the lower Fording River had 58% compliance for monthly NO<sub>3</sub> and 50% for Se.
- There have been approximately 175 comprehensive permit inspections in the SE Coal area since 2015, including a total of 33 inspections on the Valley Permit which resulted in two Notices of Compliance, five Advisories, 11 Warnings, 13 AP referrals and two Investigations.
- Enforcement responses are escalating as non-compliances continue. There has been approximately \$675K in APs assessed to Teck,<sup>s.15</sup>
- Teck has implemented a “Task Force” to develop and implement an action plan to address outstanding and recurring non-compliances.
- WQ is starting to stabilize at some target locations and is expected to improve by the end of 2022 with new treatment facilities coming online.

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