Elk Valley Water Quality Plan

2025 Implementation Plan Adjustment

July 31, 2025

A GLENCORE COMPANY

Executive Summary

Introduction and Regulatory Context

The purpose of this report is for EVR Operations Limited (EVR) to present the Elk Valley Water Quality Plan (EVWQP): 2025 Implementation Plan Adjustment (IPA), which is the water quality mitigation plan for the management of selenium, nitrate, sulphate and cadmium (known as Order constituents) in the Elk Valley. The 2025 IPA was prepared in accordance with *Environmental Management Act (*EMA) Permit 107517 and *Mines Act* C-Permit requirements to update the water quality mitigation plan for the Order constituents (nitrate, selenium, sulphate and cadmium) on a five-year cycle. The objective of this plan is to outline the timing and sizing of future water treatment and other water quality mitigations that support the objectives of the Elk Valley Water Quality Plan (EVWQP). A terms of reference for the development of the 2025 IPA was submitted and approved (in accordance with Permit 107517 requirements) and all of the terms have been met for this submission. The 2025 IPA supersedes the 2022 IPA and was developed inclusive of recent changes to the permitted mine plans.

The 2025 IPA achieves the primary objective of the EVWQP, which is to stabilize and reduce selenium, nitrate, sulphate and cadmium concentrations. This is the third update since the development of the Initial Implementation Plan (IIP) for the EVWQP in 2014. This plan builds on these previous plans and is designed to meet full compliance as soon as possible utilizing the best achievable technologies and incorporating learnings from EVR's Water Quality Adaptive Management Plan (AMP).

There are seven Order stations and seven compliance points included in Permit 107517, with locations downstream of each operation and through the Elk River to the Koocanusa Reservoir; 13 of these locations in total, as one station is both a compliance point and an Order station. Site Performance Objectives (SPOs) and compliance limits are set in Permit 107517 for the management of water quality concentrations for selenium, nitrate, sulphate and cadmium at these locations.

Significant progress has been made in the management of water quality in the Elk Valley and the majority of the treatment included in the 2025 IPA is either operational or in the advanced stages of construction and permitting. EVR has four fully commissioned and operating water treatment facilities, one at each of the Line Creek Operations (LCO) and Elkview Operations (EVO) and two at the Fording River Operations (FRO). As a result of these efforts, selenium and nitrate concentrations have stabilized and are reduced in the Fording River and downstream in the Elk River, with compliance currently maintained at most compliance point and Order stations, and full compliance for selenium and nitrate is projected by mid-2027. In addition to these operating facilities, EVR is currently in the advanced stages of construction of a new facility at LCO and making substantial upgrades and expansion to the other existing facility at LCO, both which will be operational in 2026. Further, two expansions are in progress for the FRO North Saturated Rock Fill (SRF) (the first expansion is currently under regulatory review and will be operational by the end of 2025 and the second expansion is in the advanced planning stage and will be operational by the end of 2026). The 2025 IPA includes these new and expanded projects and outlines EVR's future mitigation plan for the continued management of selenium, nitrate, sulphate and cadmium for EVR's permitted mine plans.

The mitigations included in the 2025 IPA are proven water treatment technologies and water management (i.e., diversions and storage). There are two major types of water treatment technologies utilized at EVR's mine sites: (1) tank-based active water treatment facilities (AWTFs), and (2) non-tank based facilities called Saturated Rock Fills (SRFs). There are two categories of tank-based water treatment utilized in the 2025 IPA, one that is a biological treatment process that removes nitrate from mine affected waters (through conversion into inert nitrogen gas) and transforms selenium into a solid, which is removed offsite. The other treatment technology is a membrane-high density sludge (membrane-HDS) process that removes nitrate, selenium, sulphate and cadmium. SRFs use a naturally occurring biological process that is enhanced to treat selenium and nitrate and built within former mine pits that are backfilled with rock and saturated with mine-affected water. This process

converts the dissolved selenium into a solid that is attenuated in the rock fill and the nitrate into inert nitrogen gas that is safely released. The biological and membrane-HDs treatment technologies can be combined, where appropriate and feasible, which can reduce the quantity of treatment by-products (i.e., brine from membrane-HDS being treated by the biological process). Clean water diversions are evaluated on a project-by-project basis and, where feasible, are included in the mitigation plan. Storage options are also incorporated into the mitigation plan, where feasible, to support improved utilization of existing and future treatment facilities.

EVR is currently undertaking two full-scale suboxic zone (SOZ) source control research and development trial projects (EVO Cedar North and FRO Swift North mine rock spoils). The SOZs are designed to limit oxygen supply to the mine rock resulting in the development of conditions that have the potential to reduce leaching of selenium and nitrate. The potential benefits from SOZs were not accounted for in the water quality modelling to support the development of the 2025 IPA, as the trials are still in progress, but these are important projects that may be incorporated in future IPAs.

The 2025 Implementation Plan and Compliance Evaluation

The 2025 IPA is a guide to identify the operational date, sources for treatment, and estimated capacity of future water mitigation projects required to support the EVWQP. These projects are then executed, in alignment with the plan, and adjusted based on site-specific considerations and new learnings through project planning and execution. The 2025 IPA table of treatment is outlined below in Table E.1 and the clean water diversions are listed in Table E.2.

Table E.1. 2025 Implementation Plan Adjustment - Table of Treatment.

Site	Treatment Facility (Phase) [1]	Hydraulic Capacity Up To (m^3/d)	Operational Date [2]	Order Constituents Treated
FRO	**FRO AWTF-S**	20,000	Sep 1, 2022	Selenium, nitrate
	FRO-N SRF (Phase 2)	30,000	Dec 31, 2023	Selenium, nitrate
	FRO-N SRF (Phase 3a)	10,000	Dec 31, 2025	Selenium, nitrate
	FRO-N SRF (Phase 3b)	20,000	Dec 31, 2026	Selenium, nitrate
	FRO Sulphate Treatment [3]	17,000	Dec 31, 2034	Sulphate
LCO	**WLC AWTF**	7,500	Jan 1, 2020 – Oct 1, 2026	Selenium, nitrate
	LCO AWTF [4]	17,500	Oct 1, 2026	Selenium, nitrate, sulphate, cadmium
	LCO Dry Creek AWTF (Phase 1)	10,000	Dec 31, 2026	Selenium, nitrate, sulphate, cadmium
	LCO Dry Creek AWTF (Phase 2) [5]	12,000	Dec 31, 2030	Selenium, nitrate, sulphate, cadmium
	North Line Creek (NLC) SRF	1,000	Dec 31, 2033	Selenium, nitrate
GHO	Cougar South Pit (CSP) SRF	3,000	Dec 31, 2041	Selenium, nitrate
EVO	**EVO SRF (Phase 2)**	20,000	Sep 1, 2021	Selenium, nitrate
	EVO SRF (Phase 3)	3,000	Jan 1, 2082	Selenium, nitrate
Total Estimated Hydraulic Capacity up to (m^3/d)		163,500	-	-

[1] Treatment facilities in bold are currently either in operation or under construction.
[2] The operational date is the date when facility commissioning activities are completed.
[3] The treatment assumptions for sulphate removal are limited to sulphate for this treatment facility for the purposes of the 2025 IPA; load removal for selenium, nitrate and cadmium will be considered through more detailed project planning phases.
[4] This treatment facility is a combination of the existing WLC AWTF biological treatment with a membrane-HDS treatment and the hydraulic capacity listed in the table applies to selenium and nitrate treatment; the component that specifically treats for sulphate and cadmium is up to 14,300 m^3/d hydraulic capacity.
[5] The LCO Dry Creek AWTF Phase 2 is included as per design capacity and mechanical completion date outlined in Permit 107517 Appendix 4F – Line Creek Operations Dry Creek and also in Mines Act Permit C-129. An amendment request can be made by EVR that, if approved, could result in a change to this date, capacity and/or treatment technology.

Table E.2. 2025 Implementation Plan Adjustment – Clean Water Diversions.

Clean Water Diversion	Associated Water Treatment Facility	Operational Date	Streams and Volume Diverted
Kilmarnock Creek	FRO AWTF-S	In place and operating	Upper Kilmarnock Watershed, up to 86,000 m^3/d
No Name Creeks	LCO AWTF	October 1, 2026	No Name Creek estimated at up to 120,000 m^3/d
Upper Line Creek and Horseshoe [1]	LCO NLC SRF	December 31, 2033	Upper Line Creek and Horseshoe Creek estimated at up to 35,000 m^3/d

[1] The efficacy of the CWDs at LCO are being evaluated with the next phase of treatment at this operation and adjustments to the diversion strategy may be made based on feasibility and environmental effects. These diversions are not projected to be required to support compliance at the Line Creek Compliance Point.

Selenium and nitrate concentrations have stabilized and are reduced in the Fording River and downstream in the Elk River, with compliance currently maintained at most compliance points and Order stations, and full compliance for selenium and nitrate is projected by mid-2027. Compliance for nitrate and selenium is currently achieved and projected to be maintained at the Elk River upstream of Boivin (GH_ER1; E206661), Elk River downstream of Michel Creek (EV_ER1; 0200393), Elk River at Elko Reservoir (RG_ELKORES; E294312) and Koocanusa Reservoir (RG_DSELK; E300230) Order stations and at the following compliance points: GHO Elk River Compliance Point (GH_ERC; 300090), EVO Harmer Creek Compliance Point (EV_HC1; E102682), CMm Compliance Point (CM_MC2; E258937), and EVO Michel Creek Compliance Point (EV_MC2; E300091). Selenium and nitrate concentrations will be maintained below SPOs and compliance limits at all seven Order stations and all seven compliance points by mid-2027, following the commissioning of the FRO-N SRF Phase 3b.

Sulphate concentrations are currently below limits and SPOs at all compliance points and Order stations. Sulphate concentrations are projected to be maintained below these thresholds at all locations except at the Order station (and compliance point) GH_FR1 (Fording River downstream of Greenhills Creek; 0200378) and the FRO Compliance Point (FR_FRABCH; E223753). Sulphate concentrations are projected to exceed the SPO at GH_FR1 seasonally February through April (in some or all of these months depending on the year) beginning in 2032 until mid-2035 and the compliance limit at FR_FRABCH in 2029, and 2031 through mid-2035 in January through April (some or all of these months depending on the year). Compliance is projected to be attained and maintained a few months after the commissioning of the FRO Sulphate Treatment facility. Compliance for cadmium is currently achieved and projected to be maintained at all locations.

Integrated Aquatic Effects Assessment

The objective of the integrated effects assessment is to evaluate potential area-based effects to aquatic health for each management unit (MU) during periods when water quality is projected to be potentially greater than compliance limits and SPOs for nitrate, sulphate, and selenium. The EVWQP divided the Designated Area into six MUs (i.e., MU1 – MU6). Assessment screening criteria are based on area-based protection goals from the EVWQP. Where screening criteria were met, projected water quality conditions were interpreted to be protective of aquatic health. Not meeting screening criteria does not necessarily mean that aquatic health will not be protected; however, such results require further evaluation.

Key findings of the integrated assessment are summarized by constituent:

- Nitrate – Screening criteria were met for benthic invertebrates, fish, and amphibians for all assessment periods (2025-2035) in all assessed MUs (1, 2, and 4).
- Sulphate – Screening criteria were met for benthic invertebrates, fish, and amphibians for all assessment periods (2025-2057) in MU1 for the IPA scenario (i.e., with sulphate treatment) and no treatment scenario (i.e., without sulphate treatment).
- Selenium - Screening criteria were met for benthic invertebrates, amphibians, and aquatic-feeding birds for all assessment periods (2025-2035) in all assessed MUs (1, 2, and 4), and for fish for all assessment

periods (2025-2035) in MU2 and MU4. For fish in MU1, screening criteria were met for fish reproduction and the integrated effect criterion was met for juvenile fish growth; however, the mainstem criterion was not met for juvenile fish growth, indicating a potential for low-level growth effects (up to 13%) to juvenile fish feeding in the mainstem Fording River immediately downstream of the Fording River South AWTF. These results reflect the projected localized influence of organoselenium, which EVR is actively working to reduce. Given the low integrated effect size and spatially limited area, selenium conditions across MU1 are expected to be protective of aquatic health, although with lower confidence relative to other MUs that met screening criteria.

Based on the above results, projected water quality conditions as presented in the 2025 IPA are expected to be protective of aquatic health in the MUs.

Next Steps

Significant progress has been made in the management of water quality in the Elk Valley and the majority of the treatment included in the 2025 IPA is either operational or in the advanced stages of construction and permitting. As a result of these efforts, selenium and nitrate concentrations have stabilized and are reduced in the Fording River and downstream in the Elk River, with compliance currently maintained at most compliance point and Order stations, and full compliance for selenium and nitrate is projected by mid-2027. The 2025 IPA outlines EVR's future mitigation plan for the continued management of selenium, nitrate, sulphate and cadmium for EVR's permitted mine plans.

For future water quality mitigation projects outlined in this IPA, the final configuration (timing, hydraulic capacity, sources and associated CWDs) may vary from the 2025 IPA. Detailed engineering design and permitting of these future facilities will be based on the most up-to-date understanding of engineering, modelling and other environmental factors associated with each mitigation project, as each project will be optimized based on knowledge gained through the work to complete engineering and permitting and based on the experience of operating other facilities at EVR's operations. Future adjustments to the mitigation plan for Order constituents will build on the knowledge attained through our extensive operating experience of existing water treatment technologies and those alternate mitigation measures that are developed and proven through the Research & Development program, as well as the cumulative improvements in the Regional Water Quality Model (that is used to develop the mitigation plans) that result from our consistent focus on uncertainty reduction.

List of Authors and Contributors

The preparation of the 2025 Implementation Plan Adjustment has been a collaborative effort between EVR staff and technical consultants, with engagement from BC Ministries, Ktunaxa Nation Council, and Yaq̓it ʔa·knuqƛi ’it through the development of the Terms of Reference.

Technical Consultants:
Hatch Ltd.
Hyaltus Inc.
SRK Consulting (Canada) Inc.
WSP Canada Inc.

EVR Staff
Mariah Arnold, Manager, Aquatic Sciences
Jasiel Austin, Engineer in Training, Mining
Christian Baxter, Director, Environmental Strategy
Ashley Bertram, Coordinator, Adaptive Management
Keenan Brockman, Engineer, Water Modelling
Gurprit Chahal, Principal Environmental Engineer
Lauren Cook, Director, Legal & Regulatory Affairs
Thomas Davidson, Superintendent, Water Operations
Lucy Eykamp, Manager, Regulatory Approvals
Matthew Gay, Former Program Director, Water Strategy
Holly Hetherington, Senior Lead, Adaptive Management
Evan Hillman, Senior Project Lead
Parnian Hosseini, Engineer, Water Modelling
Liz Karbashewski, Former Director, Applied Research & Development
Luke Kary, Geoscientist in Training, Water Modelling
Adam Langer, Director, Water Projects
Stephanie Lemieux, Lead, Water Systems
Jessica Mackie, Manager, Water Modelling
Nick Manklow, Senior Supervisor, Aquatic Sciences
Vanessa Mann, Senior Engineer Supervisor, Research & Development
Eleanor McAuley, Former Senior Lead, Portfolio Management
Colin Miller, Program Director, Water Quality & Projects
Colleen Mooney, Senior Lead, Human Health
Kate Moreira, Senior Engineer, Water Modelling
Norma Moreno, Lead, Water Modelling
Dan Myck, Director, FRX Project
Rory O’Connor, Director, Indigenous & Government Affairs
Shireen Ouellet, Senior Supervisor, Water Quality
June Pollard, Senior Supervisor, Research & Development
Lindsay Watson, Manager, Fish & Fish Habitat Planning

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- Appendix I: SRK Consulting (Canada) Inc. (SRK). 2025. Memo: Estimation of Conservative Upper Bound Entrainment for 2025 IPA. Prepared for Elk Valley Resources. February 19, 2025.
- Appendix J: Hyaltus Inc. (Hyaltus). 2025. 2025 Implementation Plan Adjustment Support, Future Climate Processing and Evaluation.

Hatch. 2025b. Elk Valley Water Quality Plan – 2025 Implementation Plan Adjustment – Modifications to RWQM.

- Appendix D: WSP Canada Inc. (WSP). 2025. Fording River Operations – Modifications to the Regional Water Quality Model and Recalibration of Order Constituents. Prepared for EVR Operations Limited. July 2025.
- Appendix E: SRK. 2025. Backfilled Waste Rock Rehandle Source Term – Lake Mountain Pit, Fording River Operations. Prepared for EVR Operations Limited. June 27, 2025.

Hatch. 2025c. Elk Valley Water Quality Plan – 2025 Implementation Plan Adjustment – Site Conditions Report.

WSP. 2025. Integrated Effects Assessment – 2025 Implementation Plan Adjustment. Prepared for EVR Operations Limited. July 2025.

Acronyms and Abbreviations

Acronym or Abbreviation	Description
AMP	Water Quality Adaptive Management Plan
ANFO	Ammonium nitrate fuel oil
AOP	Advanced oxidation process
AWTF	Active water treatment facility
BC	British Columbia
CMm	Coal Mountain mine
COI	Communities of Interest
CWD	Clean water diversion
EMA	*Environmental Management Act*
EMC	Environmental Monitoring Committee
ENV	Ministry of Environment and Parks

Acronym or Abbreviation	Description
EVO	Elkview Operations
EVR	EVR Operations Limited (Elk Valley Resources)
EVWQP	Elk Valley Water Quality Plan
FRO	Fording River Operations
FRO-N	Fording River Operations - North
FRO-S	Fording River Operations - South
GCM	Global climate model
GHO	Greenhills Operations
HDS	High Density Sludge
IEA	Integrated effects assessment
IIP	Initial Implementation Plan
IPA	Implementation Plan Adjustment
KNC	Ktunaxa Nation Council
KU	Key Uncertainty
LCO	Line Creek Operations
MCM	Ministry of Mines and Critical Minerals
MU	Management Unit
NLC	North Line Creek
PAG	Potentially Acid Generating
R&D	Research and Technology Development
RO	Reverse osmosis
RWQM	Regional Water Quality Model
SOZ	Suboxic zone
SPO	Site Performance Objective
SRF	Saturated Rock Fill
SSP	Shared Socioeconomic Pathways
ToR	Terms of Reference
TRA	Technology Readiness Assessment
TRL	Technology Readiness Level
UU	Underlying uncertainty
WLC	West Line Creek
YQT	Yaq̓it ʔa·knuqƛi ’it

Units of Measure

Unit of Measure	Description
%	percent
>	greater than
<	less than
BCM	bank cubic metre
m^3	cubic metres
m^3/d	cubic metres per day
mg/L	milligrams per litre
µg/L	micrograms per litre

1 Introduction

1.1 Purpose and Content of Report

The purpose of this report is for EVR Operations Limited (EVR) to present the Elk Valley Water Quality Plan (EVWQP): 2025 Implementation Plan Adjustment (IPA), which is the water quality mitigation plan for the management of selenium, nitrate, sulphate and cadmium (known as Order constituents) in the Elk Valley as required by Ministerial Order M113[1]. The submission of this report meets the requirements outlined in *Environmental Management Act* (EMA) Permit 107517 and EVR's five *Mines Act* C-Permits for our Elk Valley operations specific to the submission of an updated water quality management plan (or implementation plan) by July 31, 2025 (updated every five years)[2]. The 2025 IPA includes current and future mitigations with estimated sequence, timing, location and capacity for treatment as well as the sources that are prioritized and included in the treatment plan.

The 2025 IPA achieves the primary objective of the EVWQP, which is to stabilize and reduce selenium, nitrate, sulphate and cadmium concentrations (Teck 2014). This is the third update since the development of the Initial Implementation Plan (IIP) included in the EVWQP in 2014. This plan builds on these previous plans and is designed to meet full compliance as soon as possible utilizing the best achievable technologies and incorporating learnings from EVR's Water Quality Adaptive Management Plan (AMP).

EVR acknowledges that there have been challenges in meeting the requirements of Permit 107517, despite reasonable efforts. There were delays in the execution of the original IIP schedule provided in the EVWQP as a result of new understandings in treatment processes and specifically the need to assess and implement an additional treatment unit (i.e., advanced oxidation process [AOP]) at the West Line Creek Active Water Treatment Facility (WLC AWTF) and the Fording River Operations – South (FRO-S) AWTF to reduce selenium speciation and bioaccumulation downstream of these facilities. There were also important new learnings since the development of the EVWQP that resulted in significant improvements in the modelling of water quality in the Elk Valley that included refinements in the understanding of the effects of lag times in the release or constituents from mine rock and the influence of groundwater. These new learnings resulted in the need to implement more treatment sooner than originally planned in order to attain compliance for the Order constituents as soon as possible.

Significant progress has been made in the management of water quality in the Elk Valley and the majority of the treatment included in the 2025 IPA is either operational or in the advanced stages of construction and permitting. EVR has four fully commissioned and operating water treatment facilities, one at each of the Line Creek Operations (LCO) and Elkview Operations (EVO) and two at the Fording River Operations (FRO). In addition to these operating facilities, EVR is currently in the advanced stages of construction of a new facility at LCO and making substantial upgrades and expansion to the other existing facility at LCO, and both will be operational in 2026. Further, two expansions are in progress for a FRO facility (the first expansion is currently under review and will be operational by the end of 2025 and the second expansion is in the advanced planning stage and will be operational at the end of 2026).

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[1] In April 2013 the B.C. Minister of Environment issued Order M113 (the Order) directed EVR (formerly Teck Coal) to develop an area-based management plan under Section 89 of the province's *Environmental Management* Act (Province of British Columbia 2013) for the Elk Valley Designated Area, this plan is known as the Elk Valley Water Quality Plan (EVWQP). The EVWQP (Teck 2014) was submitted and approved in 2014 and as required by Ministerial Order M113 considers environmental, economic, and social factors to achieve a sustainable balance for managing water quality.

[2] To enforce the commitments in the EVWQP, *Environmental Management* Act Permit 107517 was issued to EVR and amendments were made to each of EVR's five Elk Valley operations *Mines* Act C-2, C-3, C-84, C-129 and C-137 permits.

The four operating facilities are:

- The WLC AWTF at LCO, completed in 2014.
- The EVO Saturated Rock Fill (SRF), where testing and water treatment began in 2018 and the facility was expanded in 2021.
- The FRO South AWTF, completed in 2022.
- The FRO North SRF, where Phase 1 was completed in 2022 and Phase 2 in 2023.

The treatment facilities that are under construction are:

- An upgrade and expansion of the West Line Creek AWTF to include an additional membrane-high density sludge treatment unit and additional treatment capacity (to be completed in 2026).
- A new LCO Dry Creek AWTF (to be completed in 2026).
- Two separate expansions at the FRO North SRF to increase capacity (to be completed in 2025 and 2026).

The content of report is as follows:

- Section 1 - Introduction and regulatory context.
- Section 2 - Process undertaken to update the mitigation plan.
- Section 3 - The adjusted table of treatment presented in the 2025 IPA, which details EVR's plan for the management of selenium, nitrate, sulphate and cadmium concentrations in the Elk Valley, along with supporting assessment (water quality projections, sensitivity analysis and an integrated effect assessment).
- Section 4 – Execution of the 2025 and future IPAs.

1.2 Background

EVR operates four steelmaking coal mine operations and has one mine in care and maintenance within the Elk Valley, a watershed located in the southeast corner of British Columbia. These operations include Fording River Operations (FRO), Greenhills Operations (GHO), Line Creek Operations (LCO), Elkview Operations (EVO), and Coal Mountain mine (CMm), the latter being under care and maintenance status. The locations of the operations are shown on Figure 1.1.

The mining process generates mine rock that contains naturally occurring constituents such as selenium, an element that is essential for human and animal health in small amounts. Water from precipitation and runoff flows through mine rock and carries selenium, nitrate, sulphate, cadmium and other constituents to the local watershed. If present in high enough concentrations, these constituents can adversely affect aquatic health.

The British Columbia Ministry of Environment (ENV) issued Ministerial Order M113 (the Order), under Section 89 of the *Environmental Management Act* (EMA), to Teck Coal Limited (Teck) in April 2013[3], requiring Teck (now EVR) to develop an area-based management plan (the Elk Valley Water Quality Plan [EVWQP]) for the Elk River watershed (Designated Area). The EVWQP was developed with input from the public, Indigenous Nations, provincial and federal governments, technical experts, and other Communities of Interest (COI). The EVWQP was submitted to the Minister in July 2014 and it was approved in November that same year. The EVWQP included an Initial Implementation Plan (IIP) and a description of the adaptive management process. The IIP identified the water mitigation required to meet

[3] On July 17, 2024, Teck Coal Limited changed its name to EVR Operations Limited. Throughout this document all references to this entity will be EVR.

the water quality requirements outlined in the EVWQP. In November 2014, the BC Ministry of Environment (now the Ministry of Environment and Parks [ENV]) issued Permit 107517 under the EMA on November 19, 2014, which established Site Performance Objectives (SPOs) for Order stations and water quality limits at compliance points for managing water quality for selenium, nitrate, sulphate, and cadmium in the Elk River (ENV 2014). The Ministry of Energy and Mines (now the Ministry of Mining and Critical Minerals [MCM]) also amended EVR's C-Permits under the *Mines Act* on November 27, 2014 to approve the water quality mitigation strategy in the EVWQP and to set out requirements related to implementation of the EVWQP[4]. Many of the actions and commitments that Teck made in the EVWQP IIP were incorporated into the permit requirements. To be in compliance, EVR must meet the requirements in both Permit 107517 and the C-Permits, including the construction and operation of treatment facilities on the timelines specified, and achievement of water quality limits. Conditions were also included that required EVR to adjust (if required) the table of treatment included with the Initial Implementation Plan (i.e., Implementation Plan Adjustment [IPA]) and submit this to the Director (Environment) and the Chief Permitting Officer on a three-year cycle[5].

The Designated Area managed by the EVWQP defined in 2013 by the BC Minister of Environment, includes the Elk River watershed and Koocanusa Reservoir to the international boundary. The Designated Area is further divided into six Management Units (MUs) based on geographic features, major tributaries and hydrodynamic characteristics (Figure 1.1). These MUs are central to the area-based nature of the EVWQP.

The EMA Permit 107517 and the *Mines Act* C-Permit amendments set out requirements for ongoing monitoring, research and technology development, adaptive management, and other conditions considered essential for the full and effective implementation of the EVWQP. The Water Quality Adaptive Management Plan provides the guiding framework for designing, implementing, monitoring, evaluating, and making adjustments to the Regional Water Quality Model (RWQM) and water quality mitigations and supporting activities under the IPA, as well as for identifying and reducing key uncertainties (KUs) and incorporating the learnings into the RWQM and IPA. These permits have required EVR to complete updates to the RWQM every three years to date and every five years going forward. The RWQM updates are model methods submissions and are focused on documenting changes to geochemistry source terms, modelling methods, calibration, and the resultant effect to model performance; RWQM updates also include updates to the permitted mine plans. Some of the changes incorporated into a RWQM update may affect projected compliance with water quality limits and SPOs, leading to necessary updates to water management and water treatment, which are captured in the IPAs (current permit requirement every five years). There have been three updates to the RWQM since the development of the 2014 RWQM, which was used to develop the IIP in the EVWQP and two IPAs; the 2025 IPA is the third update of the water quality mitigation plan for Order constituents and it has been developed using the 2023 RWQM.

[4] C-2 (EVO); C-3 (FRO), C-84 (CMm), C-29 (LCO) and C-137 (GHO) *Mines Act* permits

[5] Recently amended on July 11, 2025 to a five-year cycle

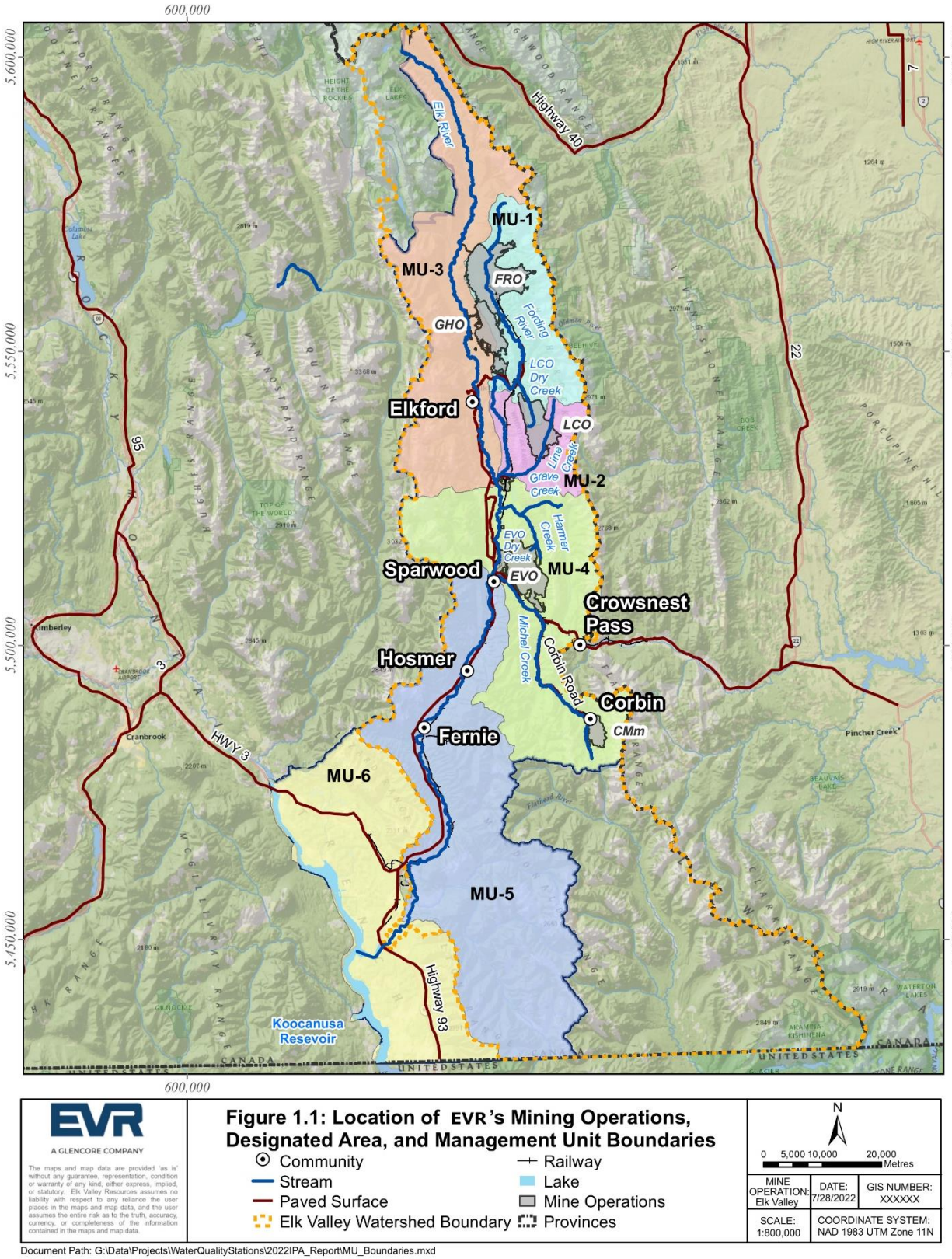


Figure 1.1. Locations of EVR's Mining Operations, Designated Area, and Management Unit Boundaries.

EVR has made significant progress on implementing water treatment in the Elk Valley with four operational water treatment facilities. The existing treatment facilities and clean water diversions in operation as of the end of 2025 are outlined in Table 1.1 and Table 1.2, respectively.

Table 1.1. Operational Water Treatment Facilities as of the end of 2025.

Treatment Facility (Phase)	Operational Date [1]	Hydraulic Capacity Up To (m^3/day)
LCO WLC AWTF	In place and operating	7,500
EVO SRF (Phase 2)	In place and operating	20,000
FRO AWTF-S	In place and operating	20,000
FRO-N SRF (Phase 2)	In place and operating	30,000
FRO-N SRF (Phase 3a)	Dec 31, 2025	10,000

[1] The operational date is the date when facility commissioning activities are completed.

Table 1.2. Operating Clean Water Diversions as of the end of 2025.

Clean Water Diversion	Associated Water Treatment Facility	Operational Date	Streams and Volume Diverted
FRO Kilmarnock Creek	FRO AWTF-S	In place and operating	Upper Kilmarnock Watershed, up to 86,000 m^3/d
LCO No Name Creek	LCO AWTF	November 1, 2025 [1]	No Name Creek estimated at up to 120,000 m^3/d

[1] The operational date for the LCO No Name Creek Diversion is assumed to be consistent with the operational date of the LCO AWTF (i.e., October 1, 2026) for modelling purposes in the 2025 IPA (Section 3.1).

1.3 Regulatory Context

1.3.1 Site Performance Objectives and Compliance Limits

Permit 107517 established Site Performance Objectives (SPOs) and compliance limits for the management of water quality concentrations for Order constituents in the Elk Valley. SPOs, which were referred to as water quality limits in the EVWQP, were set at Order stations to achieve and maintain area-based protection of aquatic ecosystem health, whereas compliance limits were set to measure regulatory compliance at specified compliance point locations at or near the downstream boundary of each operation. The locations of the compliance points and Order stations are shown in Figure 1.2.

Long-term water quality limits were developed for selenium, nitrate, sulphate and cadmium to protect the aquatic ecosystems and human health in the Designated Area under the EVWQP. Long-term limits were set to be protective of aquatic health, and short- and medium-term limits were meant to track progress towards attaining the long-term limits, recognizing the long-term limits would take time to be achieved. Three building blocks were considered to develop long-term water quality limits:

1. Science-based water quality benchmarks were developed, based on the knowledge base at that time, to be protective of aquatic life present in the Elk Valley.
2. A RWQM was developed to evaluate trends in current and projected future constituent concentrations. The 2014 RWQM incorporated the projected influence of water treatment (as per the original assumptions for the WLC AWTF) and clean water diversions (CWDs), and the ability to adjust the sequence, timing, location, and capacity of treatment and diversions.
3. An integrated effects assessment methodology was developed to assess area-based effects in each MU and evaluate long-term concentrations at specific locations (Order stations). The methodology accounts for spatial differences in water quality and aquatic effects within the MUs.

Long-term water quality limits that protect aquatic ecosystem health at a MU scale were derived by an iterative assessment of future water quality conditions under a range of treatment and diversion scenarios. If projected future constituent concentrations could be managed to remain below BC water quality guidelines or site-relevant water quality benchmarks, then these values were set as the long-term limits. Where future constituent concentrations were projected to be higher than guideline or benchmark values, an integrated effects assessment was used to derive site-specific long-term limits and timeframes at Order stations that were achievable and would provide a defined level of protection to aquatic ecosystem health in each MU. This process resulted in the design of the IIP for the phased construction of AWTFs (that was based on assumed implementation timelines and on limited operational scale knowledge and experience) and associated water management measures to meet the long-term limits. Short-term limits and timeframes were then set to define stabilization of concentrations where they are expected to exceed long-term limits without mitigation; medium-term limits were set between short-term and long-term limits to track that the Implementation Plan would stay on the trajectory to meet the long-term limits.

It is important to note that the compliance limits and SPOs in Permit 107517 were developed based on the values from the 2014 RWQM (which included the treatment timelines outlined the IIP included within the submission of the EVWQP in 2014), and as such were based on current assumptions, knowledge and information at that time. In the decade since the EVWQP was submitted in 2014, there has been considerable learnings and advancement of knowledge, such as an updated understanding of the sulphate and nitrate effects concentrations, advanced understanding of selenium speciation and subsequent delays to treatment as new technology to manage for selenium speciation had to be developed and installed (i.e. AOP), plus important new learnings that has resulted in significant improvements in the modelling of water quality in the Elk Valley that included refinements in the understanding of the effects of lag times in the release or constituents from mine rock and the influence of groundwater. These new learnings resulted in the need to implement more treatment sooner than originally planned in order to attain compliance for the Order constituents as soon as possible. Despite these new learnings and knowledge advancement the timing of the medium- and long-term step downs in the limits and SPOs (which are based outputs from the 2014 RWQM) have not been adjusted to align with current feasible timelines for water treatment.

1.3.2 Permit Requirements Related to the 2025 Implementation Plan Adjustment

The 2025 IPA is developed in response to regulatory requirements under Permit 107517, issued to EVR pursuant to the British Columbia *Environmental Management Act* and site-specific C-Permits, issued to EVR pursuant to the *Mines Act.* Other provincial or federal regulatory requirements applicable to EVR's operations are outside the scope of this submission. Table 1.3 provides the relevant permit conditions and how they have been addressed.

1.3.3 Terms of Reference

As per Section 7.1.3 of Permit 107517, EVR developed a Terms of Reference for the 2025 IPA (a new requirement), outlining key treatment-related model assumptions, sensitivity scenarios, and expectations for the update. The document underwent revisions through extensive consultation and engagement with ENV, MCM, and representatives of the Ktunaxa Nation Council (KNC) and Yaq̓it ʔa·knuqƛi ’it (YQT) from April 2024 to April 2025 (Section 1.6). Feedback gathered during this process was incorporated into the final Terms of Reference (EVR 2025), which was approved by the director on May 12, 2025 (ENV 2025). The final terms of reference and how they have been addressed are detailed in Table 1.4.

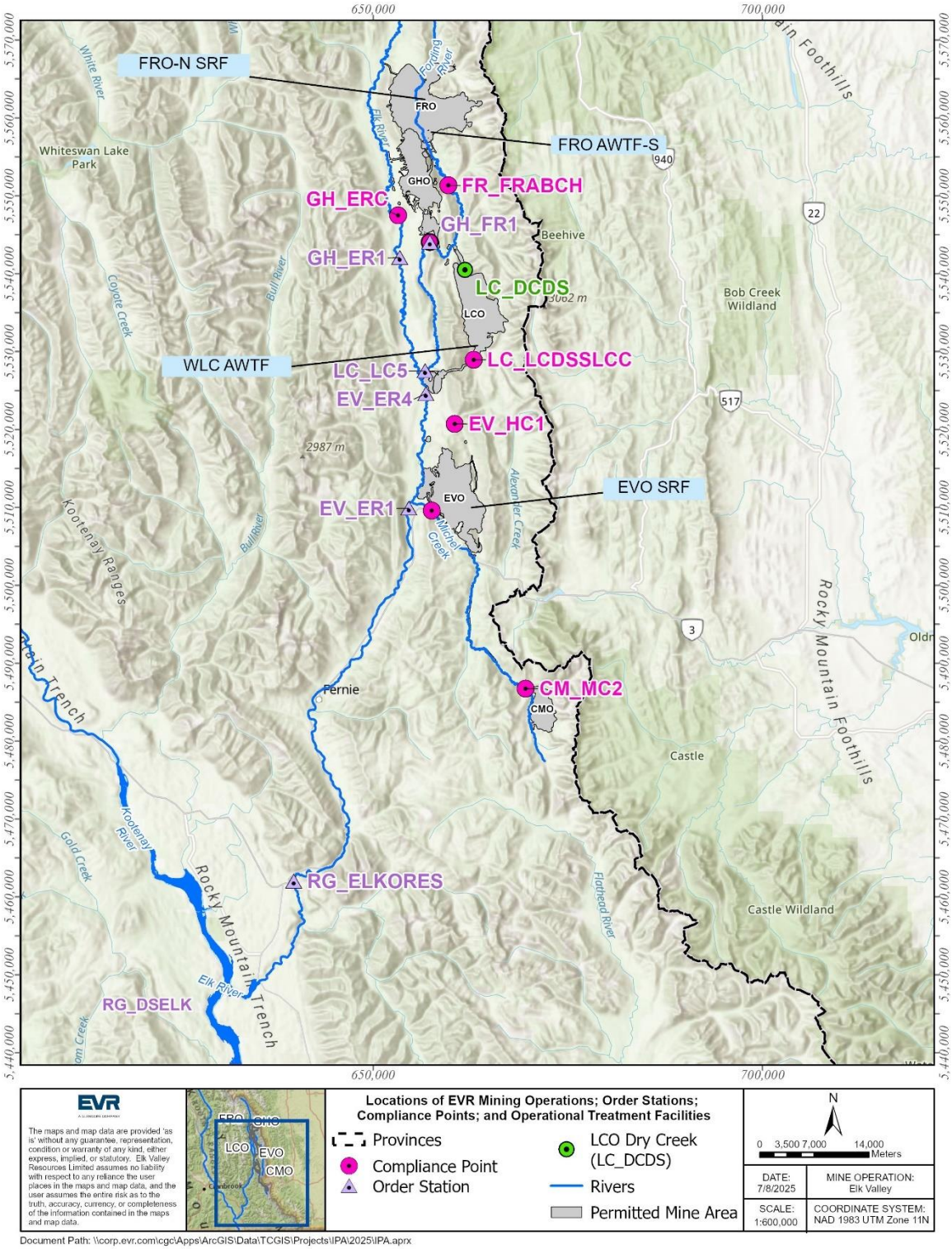


Figure 1.2. Locations of EVR Mining Operations, Order Stations, Compliance Points and Operational Water Treatment Facilities.

Table 1.3. Permit Requirements Related to the 2025 Implementation Plan

Permit	Date	Condition	Condition	How the requirement is addressed
EMA Permit 107517	November 8, 2024	7.1	7.1 WATER QUALITY MITIGATION PLAN 7.1.1 The permittee must develop a Water Quality Mitigation Plan and submit it to the director, with a copy provided to the Ministry of Energy, Mines and Low Carbon Innovation Chief Permitting Officer, by July 31, 2025. The Water Quality Mitigation Plan, and any updates to it required under Section 7.1.6 must:	This submission
			7.1.1.1 Demonstrate how the Compliance Point limits and Site Performance Objectives for Compliance Points and Order Stations for the Order Constituents will be met, using the most recent Regional Water Quality Model described in Section 9.9, the most recent permitted development for the permittee's five Elk Valley coal mine sites, and by implementing Best Achievable Technology, including water treatment technologies and source control measures that have been accepted for use in mitigation planning;	Section 3.2
			7.1.1.2 For each proposed water treatment facility clearly identify the proposed location, Treatment Source(s), Effective Treatment Capacity, and Operational Date;	Section 3.1
			7.1.1.3 Provide water quality projections for Order Constituents at Compliance Points and Order Stations for the Permitted Development Planning Period;	Section 3.2.1 and 2025 IPA Methods and Projected Concentrations Report (Hatch 2025a)
			7.1.1.4 Be modified or amended as required by the director, and the permittee must, within the timeframe specified by the director, resubmit to the director the Water Quality Mitigation Plan with any required modifications or amendments;	Not applicable
			7.1.1.5 Be developed in accordance with the approved Terms of Reference described in Section 7.1.3; and,	Section 1.3.3
			7.1.1.6 Include: a) A description of any measures other than water treatment that the permittee expects to seek approval to implement (or can implement without requiring formal approval) in the next five years for the purpose of improving water quality or reducing reliance on water treatment; and b) Information on timing and extent of measures referred to in paragraph 7.1.1.6 a), to the extent known.	Discussion in Section 2.5
			7.1.2 The permittee must submit Regional Water Quality Model output data in digital spreadsheet format (i.e., Microsoft Excel) for the Water Quality Mitigation Plan scenario including projected monthly average concentrations under the range of projections used for mitigation planning.	Excel file provided
			7.1.3 The permittee must develop a Terms of Reference for the Water Quality Mitigation Plan updates required under section 7.1.6. The Terms of Reference must describe the treatment-related model assumptions used, the sensitivity scenarios, and other expectations for the update. The permittee must submit the Terms of Reference to the director, for approval, with a copy provided to the Ministry of Energy, Mines and Low Carbon Innovation Chief Permitting Officer, by April 30, 2027, and updates to the Terms of Reference must be provided to the director by the third anniversary of that date.	For this submission: • Initial Terms of Reference Submitted April 29, 2024 • Table Planning Assumptions Submitted November 25, 2024 • Final Terms of Reference submitted February 3, 2025
			7.1.4 The director may approve the Terms of Reference submitted under Section 7.1.3, amend them, or require the permittee to amend. 7.1.5 The director may consider the Water Quality Mitigation Plan and/or request additional information to update other requirements such as those in Section 7.2 of this permit. 7.1.6 No later than April 30, 2028, and every three years thereafter, the permittee must submit updates to the Water Quality Mitigation Plan in accordance with Section 7.1.1 prepared in accordance with the most recent Terms of Reference approved under Section 7.1.4.	Acknowledged
Permit 107517	Nov 8, 2024	10	10 ADAPTIVE MANAGEMENT The permittee must develop and implement a detailed adaptive management plan (AMP) to support implementation of the ABMP, to achieve water quality targets including calcite targets, ensure that human health and the environment are protected, and where necessary, restored, and to achieve continuous improvement of water quality in the Elk Valley. The adaptive management cycle consists of six stages, as summarized below. Elements of the AMP required for this permit have been included in the ABMP, but other key components remain outstanding, as described below. The permittee must prepare and implement an AMP to the satisfaction of the director. The AMP must fulfill the following requirements at a minimum:	Section 1.4 Section 2 Reported in AMP annual reports

Permit	Date	Condition	Condition	How the requirement is addressed
			6) Stage six – Adjust and Revise the Hypothesis and Management Strategies a. Adjust the ABMP implementation plans and actions as required, including knowledge gained from Section 7.2 – Research and Development. b. Communicate changes to ABMP implementation plans and activities to the EMC. c. Reassess expected outcomes, potential impacts, and responses to these outcomes for an adjusted plan. Where plan components are related to impacts on Human Health, the permittee shall make reasonable efforts to consult with Interior Health (hbe@interiorhealth.ca). Adjust the AMP as required in consultation with the EMC. d. Adjust the AMP as required in the consultation with the EMC	
Permit 107517	Nov 8, 2024	11	11 DATA ANALYSIS ACCOUNTABILITY AND TRANSPARENCY – 11.1 FIRST NATIONS REPORTING REQUIREMENT Unless otherwise agreed to by the KNC and the permittee, the permittee must provide the KNC with information related to any material changes to the Water Quality Mitigation Plan, Adaptive Management Plan, the Calcite Management Plan and the Research and Technology Development Plan. In addition, the permittee must provide the KNC with all data, information and/or reports generated during the implementation of these plans in accordance with this permit.	Section 1.6 Pre-engagement in this report
C-Permits[1]	July 11, 2025	C.5.d[1] B.3.a[2]	UPDATES TO THE INITIAL IMPLEMENTATION PLAN The Permittee must update and submit the updated Water Quality Mitigation Plan to the Chief Permitting Officer by July 31, 2025, the subsequent submission by September 30, 2030, and every five years thereafter. The Permittee must ensure that the plan includes: (i) The proposed location, treatment source(s), effective treatment capacity, and operational date for each proposed mitigation, including clean water diversions and water treatment facilities. (ii) The location and construction completion date for each proposed source control facility.	This submission Reported in AMP annual reports

[1] Common requirement to the following C-Permits: Fording River Operations C-3 Approving Mine Plan and Reclamation Program; Greenhills Operations C-137 Approving Mine Plan and Reclamation Program; Line Creek Operations C-129 Approving Mine Plan and Reclamation Program.
[2] Elkview Operations C-2 Approving Mine Plan and Reclamation Program, Permit Amendment; Coal Mountain Operations C-84 Approving Mine Plan and Reclamation Program.

Table 1.4. Summary of Terms of Reference for the 2025 IPA.

Topic	Description	How the requirement is addressed
Water Quality Site Performance Objectives (SPOs) for Order stations (As described in Permit 107517)	Compliance evaluated based on projected 90th percentile concentrations with existing and planned mitigation	Section 3.2
Water Constituents (As described in Permit 107517)	Compliance evaluated for Order constituents (nitrate, selenium, and sulphate), including cadmium where mitigation is required to support compliance.	Section 3.2.1
Mine Plans	Permitted Mine Plan (as required), which will be updated to incorporate recently approved mitigation and mine development projects, up to the end of June 2024. The Permitted Mine Plan may include additional projects to the best of our abilities that have entered the permitting process that are expected to be under review before the 2025 IPA is submitted. Details on mine plan adjustments to support improvement of water quality will be described in the 2025 IPA.	Section 2.2.2
Water Management Plans	The most recent mine water management plans for each operation, with updates incorporating recent permit applications and approvals and inclusive of optimizations to support the development of the 2025 IPA.	Section 2.3.1
Water Quality Model Projections	2023 Regional Water Quality Model (RWQM), which will include updates for the 2025 IPA	Section 3.2
Flow Conditions	20 climate realizations based on the historical climate data	Section 2.2.3
Geochemical Release Rates	Based on the calibrated release rates for the 2023 RWQM; the base case will not include decay in release rates of selenium and sulphate generation	Section 2.2.3
Mitigation Measures	Mitigation measures based on technologies that can be used for mitigation planning processes (biological active water treatment facilities (AWTFs), Saturated Rock Fills (SRFs), and membrane-based treatment facilities); additional technologies that can be used for mitigation planning processes may be incorporated as the plan is developed.	Section 2.1
Source Control	Nitrogen management source control measures related to lining blasting holes will be accounted for in the historical and future nitrate projections. No other source control measures will be included in the base case for 2025 IPA.	Section 2.3.3
2025 IPA Input Assumptions for Water Treatment	The assumptions are outlined in Tables 1 and 2 of the 2025 Implementation Plan Adjustment Final Terms of Reference (EVR 2025). Table 1: 2025 Implementation Plan Adjustment – Summary Table of Input Assumptions for Water Treatment Planning and Table 2: Membrane Treatment Partition Coefficients) (EVR 2025), which include effluent assumptions for existing and future treatment facilities, hydraulic and nitrate load capacities for existing facilities. Input assumptions for the 2025 IPA are also summarized in Section 2.2.3.	Section 2.2.3
Water Treatment Effluent Actuals for Existing Operating Facilities	As per the 2022 IPA, the 2025 IPA will include effluent concentrations for selenium and nitrate for operating facilities to the end of 2024.	Section 2.2.3
Ramp-up of Future Treatment Facilities	Historical and industry ramp-up rates	Section 3.3.1
Membrane Treatment Overview	Description of the management options for membrane treatment waste streams (permeate, brine and solids) and the influence on net removal rates.	Section 2.1.2
Source Control Initiatives	Overview of source control research and development initiatives underway.	Section 2.5
Full suite of planned mitigations	Treatment required to achieve the long-term compliance limits and SPOs in Permit 107517.	Section 3.1
Sensitivity analyses	Sensitivity analyses completed to understand the potential risks of uncertainty in model inputs and assumptions on future compliance. These analyses will include an interpretation of the results, reference to existing programs targeted at reducing any associated uncertainties and/or risks through the Adaptive Management Plan, graphs for relevant locations and summary tables (if applicable). The following sensitivity analyses will be included in the 2025 IPA: Climate Change Evaluation, Nitrogen Source Control, and Treatment performance.	Section 3.3

1.4 Adaptive Management

In accordance with Section 10 of Permit 107517, EVR developed the AMP to support the implementation of the EVWQP, to achieve water quality targets including calcite targets, ensure that human health and the environment are protected, and where necessary, restored, and to achieve continuous improvement of water quality in the Elk Valley. The AMP was most recently updated in December 2024 (EVR 2024a). Adaptive management is a systematic, rigorous approach to environmental management that maximizes learning about uncertainties, while simultaneously striving to meet multiple management objectives and adapt management actions based on what is learned. The AMP consists of Management Objectives, KUs, and the adaptive management cycle. The adaptive management cycle is an iterative, six-stage cycle: assess, design, implement, monitor, evaluate and adjust.

The AMP is structured around four Management Objectives, each with unique evaluations. The progress towards and achievement of these Management Objectives collectively articulate EVR's advancement of the EVWQP. EVR progresses Management Objective 1 *Manage water quality to meet limits and SPOs for selenium, nitrate, sulphate and cadmium* through the implementation of water management measures (including nitrogen source control plans) and water treatment as outlined in the IPA.

Please refer to the 2024 AMP Update (EVR 2024a) for more information on the structure of the AMP, including Management Objectives, evaluations, KUs and continuous improvement. Annual activities under each stage of the AMP are provided in annual AMP reports (submitted July 31, annually) and progress towards Management Objectives will be included in reports for each Management Objective (various submission dates).

1.5 Scope and Scale

The water quality constituents considered under the 2025 IPA are the Order constituents. The temporal scale of the IPA is the period of time in which the mining development activities in the Elk Valley are proposed to be carried out and would report to the receiving environment; future projections and mitigation planning extends to the year 2125 in the 2025 IPA. The spatial scale of the 2025 IPA is defined by the Designated Area and six MUs, as described in Section 1.2. The purpose is to demonstrate how the 2025 IPA will manage the full effects of the permitted mine plan and to form the base case for future mining development applications.

There are three key initial inputs utilized in the IPA: the 2023 RWQM; the permitted mine plans; and the site water management plans.

- The 2025 IPA has been developed using the 2023 RWQM. The current proven mitigations are incorporated in the 2023 RWQM, which is used to develop the mitigation plan. The planning basis and assumptions related to the proven mitigations are detailed in Section 2.2.3.
- The mine plan inputs to the 2025 IPA are based on the cumulative approved mine plans and include specific details related to pit designs, mine rock placement and water management changes. The mine plans include additional projects that were expected to have been under review at the time that mine plan inputs to the 2025 IPA were cut-off. Further details are found in Section 2.2.2.
- The site-specific Water Management Plans outline the plans to manage the movement and discharge of mine-influenced and non-contact water. Further details are found in Section 2.3.1.

The mitigation plan, including the sources targeted for treatment, and the sequence, location, timing and capacity of mitigation are described in Section 3.1.

1.6 Consultation and Engagement

EVR engaged with ENV, MCM and representatives of the KNC and YQT between April 2024 and April 2025 as part of the pre-submission process for the development of the Terms of Reference for the 2025 IPA. Submissions, information and communications were exchanged during this time to gain clarity on information requirements to be included in the 2025 IPA (Table 1.5).

Table 1.5. 2025 IPA Terms of Reference Development Engagements with ENV, MCM, KNC and YQT.

Subject	Topics	Type	Date	Participants
2025 IPA Initial Terms of Reference	Water Treatment Input Information Requirements.	Submission (Section 7.1.3)	28-Apr-24	ENV, MCM, KNC, YQT
2025 IPA Terms of Reference & Initial Planning assumptions	Water Treatment Input Information Requirements & Planning assumptions table – tank-based treatment, SRF treatment, sulphate treatment, CWD, intake water collection.	Submission (Section 7.1.3)	25-Nov-24	ENV, MCM, KNC, YQT
2025 IPA Terms of Reference, Comment Responses	Responded to six KNC comments from the Initial Terms of Reference.	Submission	25-Nov-24	ENV, MCM, KNC, YQT
2025 IPA Terms of Reference, clarification meeting	Seeking clarity on comments received from ENV and KNC, and the approval process of the final Terms of Reference.	Meeting	16-Jan-25	ENV, MCM, KNC, YQT
2025 IPA Terms of Reference, comment responses	Submission of the Terms of Reference to the director for approval. Responded to an additional seven KNC comments and eleven ENV comments on the Terms of Reference.	Submission (Section 7.1.3)	3-Feb-25	ENV, MCM, KNC, YQT
2025 IPA Terms of Reference, ramp-up of treatment facilities	Meeting to discuss the approach of addressing ramp-up of treatment facilities in the 2025 IPA.	Meeting	11-Apr-25	ENV, MCM
2025 IPA Terms of Reference, final submission	Submission of the final Terms of Reference for director approval.	Submission	28-Apr-25	ENV, MCM, KNC, YQT

In addition to outreach, meetings and tours with KNC, YQT, and leaders, citizens and representatives from other Indigenous Nations and organizations, outreach to the following COIs on water quality in the Elk Valley also occurred between 2022 and 2025:

- Environment and Climate Change Canada
- Fisheries and Oceans Canada
- United States Environmental Protection Agency
- United States Geological Survey
- Montana Department of Environmental Quality
- International Joint Commission

The outreach with the above-listed COIs involved meetings and, in most cases, tours of the Elk Valley and EVR operations.

An EVWQP 2025 IPA Overview document will be developed for COI outreach and communications, and will be available for public access.

1.7 Linkages Between Water-Related Initiatives and the Implementation Plan Adjustment

An overview of the work EVR is undertaking on other water-related initiatives, water operations projects and permitting, and programs and management plans at the regional and operations levels is provided in this section.

1.7.1 Research and Development Program

The R&D program seeks to identify, develop, and deploy new technologies and/or enhance existing technologies. In the last decade, the Research & Development (R&D) Program at EVR has focused on developing more sustainable water treatment options and investigating approaches to managing constituents at the source. EVR's R&D program can be broadly divided into four categories:

- Source Control
- Non-Tank-Based/ In-situ Treatment
- Fundamental Studies
- Tank-Based Treatment

EVR generally follows five R&D stages when developing new or evaluating existing technologies. Those five stages are concept identification; preliminary lab studies, field studies or modelling; detailed lab/field studies or modelling; pilot studies; and finally full scale/permitted technology.

In addition to EVR's R&D Program, EVR also pilots commercially demonstrated technology (i.e., technology at technology readiness level (TRL) 9: *Actual technology proven through successful deployment in an operational setting*) such as the sulphate technologies piloted in 2021 (Teck 2022). Piloting objectives for commercially available technologies and larger scale R&D trials can include determining the design required to achieve treatment objectives; confirmation that treatment objectives can be achieved; effluent toxicity testing; residuals characterization and collection of data to support information requirements for permitting of full scale facilities per Section 6.4.4 Water Treatment of the "Joint Application Information Requirements Guidance Document" (EMLI & ENV 2024).

R&D projects that are in the early stages of development are not considered for inclusion in the IPA due to the level of uncertainty regarding technology viability. As projects progress through the development cycle, the understanding of system performance and associated risk improve, and technology viability for application as an effective and permitted mitigation or treatment tool in the Elk Valley can be assessed. Further information on mitigations technologies utilized in the 2025 IPA are provided in Section 2.1 and identification of future mitigation technologies is discussed in Section 2.5.

1.7.2 Current Water Mitigation Projects Under Development

A summary of water treatment facilities that are in EVR's project stage gate process and the associated permit status as applicable is provided in Table 1.6

Table 1.6. Water Treatment Facilities in EVR's Stage Gate Process at the Time of the 2025 IPA Development.

Water Treatment Facility	Planned Operational Date[1]	Hydraulic Capacity Up To (m^3/day)	Project Status
FRO-N SRF Phase 3a	December 31, 2025	10,000	Project in execution stage and planned to start commissioning during Q3 and Q4 2025, pending approval of operational permits. Operations permit applications submitted January 2025 and currently under review.
FRO-N SRF Phase 3b	December 31, 2026	20,000	Project in execution stage and operations permit applications are underway.
LCO Active Water Treatment Facility [2]	October 1, 2026	17,500	Project in execution stage and planned to start commissioning for the biological and membrane-HDS units in Q4 2025 and Q2 2026, respectively, pending approval of operational permits. Operations permits received July 2025.
LCO Dry Creek Active Water Treatment Facility	December 31, 2026	10,000	Project in execution stage and permit applications are currently under review and decisions pending for Q1 2026.

[1] The operational date when facility commissioning activities are completed.
[2] This treatment facility is a combination of biological units and membrane-HDS units and the treatment capacity listed applies to selenium and nitrate; the component that specifically treats sulphate and cadmium is up to 14,300 m^3/d hydraulic capacity.

1.7.3 Additional Water-Related Initiatives

Additional water related initiatives that are related to the 2025 IPA are described in Table 1.7.

Table 1.7. Water-related Initiatives Related to the 2025 IPA.

Initiative	Description	Key Linkage to the IPA
Site Five Year Reclamation and Mine Plans	Includes details of the mining and reclamation activities for the permitted mine plans at each site. Background information on the operation is provided, including descriptions of the regulatory and environmental context, communities of interest and Ktunaxa Nation title, rights and interests. It outlines mine designs and reclamation planning for both the first five years of the permitted mine plans and a conceptual plan spanning to the end of closure. The plan is a 'living document' that will be updated every five years and as required for permitting of changes in the mine plan.	Within the site Five Year Reclamation and Mine Plans there is a volume dedicated to Water Management. It describes EVR's plan for water management at each site, including water management structures, water quality, water quantity and conceptual closure plans. It includes information on water treatment and water infrastructure. Tools such as the site Mine RWQM that are used for current mining and planning will also be utilized at time of closure. The site Five Year Reclamation and Mine Plans were submitted Sep 30, 2021 for FRO, Dec 31, 2021 for LCO, Mar 31, 2022 for GHO and Jun 30, 2022 for EVO and are updated every five years. The next full update to the of the plans will be in 2027. Additionally, the Reclamation Liability Cost Estimate is an annual submission that provides a financial estimate of outstanding year-end reclamation, based on a stop mining scenario where no further mine rock is moved. It includes standard reclamation, long-term closure, and water treatment costs needed to meet Permit 107517 and requirements under the EMA, *Mines Act*, and BC's *Health, Safety and Reclamation Code*. Submitted with the Annual Reclamation Report, the estimate informs financial security bonding. It also reflects water treatment details from the most recent IPA.
Calcite Management Plan	A plan developed to identify a list of streams that, according to Section 3.4 of Permit 107517, must meet the Calcite Site Performance Objectives and provide a schedule for implementation of mitigation measures. Mitigation measures including antiscalant addition and/or physical remediation must be implemented according to the schedule.	Together, the IPA and the CMP are developed to manage constituents in relation to Permit 107517 and in alignment with limits/targets set out within the 2014 EVWQP. Calcite prevention projects are often bolt-on antiscalant based solutions to existing and planned AWTF and SRF projects outlined within the IPA or standalone facilities outlined within the CMP. Both the 2025 CMP and 2025 IPA will be submitted by July 31, 2025 as required by permit, and are updated every three years.
Tributary Management Plan (TMP)	A plan developed to support the maintenance of healthy aquatic ecosystems while considering the sustainable balancing of the environmental, economic, and societal costs and benefits. The TMP outlines	The TMP lists where water quality improvement projects will support the area-based management objectives within tributary watersheds that have been prioritized for

Initiative	Description	Key Linkage to the IPA
	protection and habitat rehabilitation within tributary watersheds and lists projects for water quality improvement and calcite management.	rehabilitation. The 2023 TMP was submitted July 31, 2023 and is updated every three years.
Nitrogen Source Control Plan	Site Nitrogen Source Control Plans are comprehensive plans that encompasses all water management and blasting practices at each site related to nitrogen management and controlling the release of nitrogen from the source. These plans set out management practices and responsibilities that relate to the management of water effluent discharge as required by each site's existing regulatory needs.	An overview of nitrate management is provided in Section 2.3.3. The 2025 IPA includes benefits from nitrate management as well as a sensitivity assessment on nitrate management assumptions. Site Nitrogen Source Control Plans are submitted annually on May 31.
Site Metal Leaching (ML) and Acid Rock Drainage (ARD) Plans	The objective of the site ML and ARD Plans are to determine when Potentially Acid Generating (PAG) mine rock may be encountered during operations within currently authorized pit designs and to describe the management of this material such that potential for ML/ARD in mine rock is minimized to the extent practicable both during active operations and at closure; operational flexibility is maintained by incorporating PAG mine rock monitoring and management activities into normal mining operations; requirements for active management of the site following the end of operations are minimized; and ARD potential, the potential for pH depression and accelerated leaching of heavy elements (such as cadmium) is controlled. The site ML and ARD plans are intended to cover active and future mining with monitoring being conducted on a routine basis.	PAG mine rock is included in the RWQM source terms which supports updates of the evaluation of mitigation technologies in the IPA. The site ML/ARD Plans were submitted March 31, 2025 for FRO, Jan 1, 2021 for LCO, March 31, 2025 for GHO and March 28, 2018 for EVO.
Monitoring Programs	**Regional Aquatic Effects Monitoring Program (RAEMP)** The RAEMP provides spatially comprehensive monitoring and assessment of potential mine-related effects on the aquatic receiving environment downstream of EVR's mines. Data from this assessment will help inform if additional management responses are needed. **Local Aquatic Effects Monitoring Programs (LAEMP)** The LAEMPs include monitoring and reporting on the aquatic conditions in areas local to EVR's Elk Valley mine sites. The data collected through the LAEMPs supports the evaluation of the potential effects to the	**RAEMP and LAEMP** The RAEMP and LAEMP support the development, implementation, adaptive management, and updates to the RWQM and the evaluation of mitigation technologies in the IPA. The last RAEMP report was submitted November 30, 2023, and covers monitoring from 2020-2022. The RAEMP is updated every three years. LAEMPs include Fording River, Greenhills Creek, Line Creek, LCO – Dry Creek, and Elkview. LAEMP reports are submitted annually as per Permit 107517. Supports the evaluation of Management Objective 3 (*Manage mine-related water quality to be protective of aquatic ecosystem health)* under the AMP and can inform adjustments to the IPA.

Initiative	Description	Key Linkage to the IPA
	receiving environment at a localized scale from mining and water treatment. The RAEMP and the LAEMPs were designed with input and advice from the Environmental Monitoring Committee and results are reviewed regularly with this committee. **Regional Surface Water Quality Monitoring Program** Collects surface water quality data for discharge and receiving environment sampling sites; parameters, sampling sites, and sampling frequency are specified in Permit 107517. The program is currently being implemented across the watershed. An annual report is submitted by March 31 for the previous calendar year. **Regional Surface Flow Monitoring Program** Collects flow data at the appropriate frequency, grade (quality), and spatial distribution to support the range of data uses. The program is currently being implemented across the watershed. An annual report is submitted by March 31 for the previous calendar year. The Regional Surface Flow Monitoring Plan (RSFMP) is updated every three years; the next update is required to be submitted by December 31, 2026). **Regional and Site-Specific Groundwater Monitoring Programs** Collects groundwater quality and quantity data and compares it to relevant screening values as well as historical data. These comparisons are done on both a site-specific and regional level. Groundwater chemistry is also compared to surface water chemistry to facilitate an understanding of the interactions and groundwater pathways. The programs are currently being implemented across the watershed. An annual report is submitted by March 31 for the previous calendar year. The Regional and Site-Specific Groundwater Monitoring Programs are updated every three years in consultation with the Groundwater Working Group (a subject-matter subgroup of the EMC); the next updates are due to be submitted by September 30, 2026.	**Regional and Local Water Quality and Quantity Monitoring Programs** Support updates to the RWQM, comparisons to limits and SPOs, the evaluation of mitigation technologies in the IPA, and the evaluation of Management Objective 1 (*Manage water quality to meet limits and SPOs for selenium, nitrate, sulphate and* cadmium) under the AMP.

Initiative	Description	Key Linkage to the IPA
Environmental Management System (EMS)	The EMS provides a framework and commitment to continually improve our environmental performance. The processes and procedures established, implemented and maintained align with the ISO 14001 standard and support compliance with legal requirements. The EMS helps us meet our environmental objectives and minimize our environmental footprint.	Water treatment operations facilities are operated within the scope of the Water Quality Management Environmental Management System. This management system puts in place processes to identify and mitigate environmental risk and maintain compliance with regulatory requirements. Programs supporting this management system include an environmental risk register, regulatory compliance and incident management system, environmental training program, and ongoing continual improvement objectives.

2 Implementation Plan Adjustment Update Process

EVR has made significant progress in the advancement of the implementation of treatment, with four operating water treatment facilities (two AWTFs and two SRFs) in the Elk Valley. There are two facilities that are in advanced stages of construction and will be operational in 2026 (upgrades and expansion of the WLC AWTF and a new LCO Dry Creek AWTF), and two expansions in progress for the FRO-N SRF (the first expansion is currently under review and will be operational by the end of 2025 and the second expansion is in the advanced planning stage and will be operational at the end of 2026). These facilities and expansions form the basis for the 2025 IPA with future mitigations optimized in an iterative manner to support a feasible plan to maintain compliance with water quality limits and SPOs.

The IPA is developed with an iterative process that utilizes the most up-to-date RWQM (which includes the current and future permitted mine plans and water management plans) and includes sufficiently mature treatment technology from the R&D program, which forms EVR's treatment toolbox. Treatment technologies are incorporated into the IPA to improve the long-term sustainability of mining "by enhancing cost-effectiveness, long-term operation and maintenance, and environmental performance" (EVWQP Chapter 11.1). The broad factors that EVR considers in evaluating effectiveness of combined control methods include the ability to contribute to meeting compliance requirements, safety and environmental risk, constructability, cost, and operability, among others. Learnings from evaluations and the reduction of KUs under Management Objective 1 are incorporated into the IPA, as appropriate. Additionally, learnings from evaluations under Management Objective 3 may be incorporated into the IPA. See the 2024 AMP Update, Section 3.1 for more information.

The process for evaluating the RWQM, R&D options for inclusion in the IPA, and water quality projections in the IPA are provided in the 2024 AMP Update, Section 3.1.2.

The process to develop the 2025 IPA included refinements to both the water quality management decisions (i.e., the sources to target for treatment and how quickly treatment could be constructed) and data-based inputs (i.e., the effluent quality from treatment, release rates, and water availability for treatment) used to develop the last IPA. The updated understanding was reflected in the water quality modelling completed to support the development of the 2025 IPA and is expected to be adjusted over time.

Preparation of the 2025 IPA involved the following steps, first to determine the mitigation plan for selenium and nitrate, and then to determine the mitigation plan for sulphate:

- Update the 2023 RWQM (Section 2.2.1 and Section 2.2.2)
- Evaluate R&D options for inclusion in the plan (Section 2.5)
- Confirm planning basis and assumptions for treatment effectiveness (Section 2.2.3)
- Formulate the mitigation plan for the 2025 IPA (the methods and projected concentrations are detailed in Hatch [2025a] and the results are presented in Section 3):
    - Updating the mine and water management plans to incorporate recently permitted changes and additional mine development projects as appropriate
    - Update near-term water treatment to incorporate projects that have been included since the cut-off for the 2023 RWQM update
    - Revise water treatment assumptions for approved technologies, and
    - Assess compliance and optimize water management and treatment (facility timing, capacity, source prioritization, etc.) to support compliant future projections.

- Identify additional potential treatment requirements through the far-future (up to 2125).
- Complete sensitivity analyses on specific model assumptions and inputs in order to understand the potential risks that each category of uncertainty poses to mitigation planning (Section 3.3 and Hatch [2025a]).
- Evaluate potential effects to aquatic health through completion of the integrated effects assessment (WSP 2025).

2.1 Water Treatment Technologies Included in the 2025 IPA

EVR is continually researching water treatment technology to support compliance with the EVWQP. The goal is to have mitigation technologies available that can be deployed to meet EVR's permit, regulatory and legal requirements and support the protection of aquatic and human health. To date, these technologies include two types of tank-based AWTFs (biological and membrane high-density sludge) and SRFs, supported by CWDs.

When evaluating treatment processes for the IPA, several criteria are evaluated to identify which technology is ultimately used. The list of criteria include:

- Suitable location sized to facility footprint (e.g. SRF's required mined out, backfilled pit with available volume to support treatment, ability to install wells and support infrastructure
- Allowance for appropriate baseline data collection and engineering (typically 3-5+ years before treatment is required)
- Source water availability based on the RWQM
- Sources to target for treatment and how quickly treatment could be constructed.

The following sections provide an overview of the mitigation technologies included as part of the planning basis in the 2025 IPA.

2.1.1 Biological Tank-Based Active Water Treatment Facilities

Biological tank-based treatment relies on microorganisms to convert dissolved nitrate and selenium into forms which can be removed from the water. Nitrate is largely converted into nitrogen gas which is off gassed to atmosphere, and dissolved selenium is converted to solid forms and removed from the water via solid-liquid separation steps.

2.1.2 Membrane High-Density Sludge Active Water Treatment Facilities

Membrane-HDS technology includes the following systems:

- Ultrafiltration (UF) system, which allows the membranes downstream to function more reliably and effectively. The first stage UF filtrate is sent to the membrane system for further treatment, while the concentrate is sent through a second stage UF for higher water recovery.
- Membrane system, which removes dissolved constituents from the ultrafiltration filtrate and produces two streams: membrane permeate (treated water), and brine (concentrated stream with high constituent/solute concentrations).
- High density sludge (HDS), which removes constituents from brine and UF backwash, and produces processed brine and solids residuals.

Management options of permeate and processed brine considered in the 2025 IPA and partitioning coefficients for each of brine, permeate, and HDS solids components are described in Section 2.2.3.

Future sulphate treatment in the 2025 IPA assumes the selection of membrane-HDS technology; however, project-specific technology evaluations will be undertaken prior to execution of sulphate treatment.

2.1.3 Saturated Rock Fills

A Saturated Rock Fill (SRF) is a biological treatment process established in a mined-out pit that has been backfilled with mine rock and allowed to fill with water from its local catchment. The treatment process involves injecting water containing elevated concentrations of dissolved nitrate and selenate into a well field in the SRF with the addition of carbon (methanol) and nutrients (phosphorus). Nitrate and selenate reduction occurs through anaerobic respiration within a treatment zone at depth. The treatment zone is the area where microbes (as a biofilm) have grown in response to the added carbon and nutrients, and is spatially focused around the point of injection. Reduction processes in the biofilm remove nitrate and selenium from solution; nitrate by denitrification to nitrogen gas, and selenium by precipitation or biomineralization to less soluble or solid forms (e.g., selenite, elemental selenium or selenium sulphides) that remain within the rock matrix.

Work to understand the viability of SRFs as a water treatment technology has progressed under Underlying Uncertainty (UU) 1.4.1 (Are saturated rock fills a viable alternative to active water treatment?) of KU 1.4 (Are there better alternatives to the current active water treatment technologies?) and SRFs were included as mitigation technology in the 2022 IPA. The SRF process for selenium and nitrate removal has undergone a British Columbia Provincial Technology Readiness Assessment and has been assessed as Technology Readiness Level (TRL) 7. EVR's application for TRL 8 was submitted April 30, 2025, and is currently under review with Provincial Regulators.

Input assumptions for water treatment planning used to inform the 2025 IPA are summarized in Table 2.4.

2.2 Water Quality Modelling, Planning Basis and Assumptions

The RWQM is the tool used to simulate how historical, current, and future mining activities could affect concentrations of constituents of interest in the watercourses in the Elk Valley. The model is a numerical representation of the conceptual understanding of how constituents are generated and released from EVR's mining operations and how the constituents are transported through the receiving environment. Updates are made based on interim and final learnings from the reduction of KUs 1.2 and 1.3 (see 2024 AMP Update Section 3.1.3) as well as improvement in model methods and up-to-date monitoring results, refinements to source terms, and climate data. Model performance is analyzed by comparing modelled flow and nitrate, selenium, and sulphate concentrations with monitored flows and concentrations. Please see the 2023 RWQM Update for more information on the most up-to-date version of the RWQM that was used for the development of the 2025 IPA (EVR 2024b).

EVR is required to update the RWQM every five years in accordance with Permit 107517 and the *Mines Act* C-Permits for each operation.

Updates to the develop the 2023 RWQM included:

- hydrology and water quality model components merged into a single model
- incorporation of all hydrology simulations into a single, universal, and parsimonious hydroclimatic model covering the entire Elk River watershed and all land uses
- development of a single hydroclimatic model in the form of a grid dataset
- semi-distributed spatial structure where aquifers and surface water-groundwater interactions are represented in each of the model catchments as opposed to select model nodes

- improved numerical representation of unsaturated flow in mine rock spoils
- solute transport in unsaturated mine rock spoils, in groundwater, and in surface water systems explicitly were updated to be represented with an approximation of advection-dispersion processes
- flow and load relationships were modified to be represented mechanistically
- the numerical architecture of the RWQM were modified from a scalar format to an array format

Modifications made to the 2023 RWQM since the submission of the 2023 Elk Valley Regional Water Quality Model Update (EVR 2024b) are described in detail in Hatch (2025b). These changes and the updates to the permitted mine plans were made prior to undertaking the process of updating the mitigations for the 2025 IPA. They are grouped into two categories: changes made to the 2023 RWQM and modifications made to model inputs related to mine site conditions.

2.2.1 Modifications Made to the 2023 Regional Water Quality Model

Updates were made to the 2023 RWQM since the submission of the 2023 RWQM to support the 2025 IPA included:

- mine rock volumes and explosives information updated to the end of 2023
- updated permitted mine plans to reflect recent approvals and additional mine development projects as appropriate
- inclusion of current near-term water mitigation projects undergoing regulatory review (i.e., FRO-N SRF Phase 3a, LCO Line Creek Treatment, LCO Dry Creek Treatment) or in EVR's project stage gate process (i.e., FRO-N SRF Phase 3b)

Detailed information around updates made to the 2023 RWQM between the submission and the development of the 2025 IPA are documented in Hatch (2025b).

2.2.2 Modifications Made to Model Inputs Related to Mine Site Conditions

The permitted mine plans used in the 2023 RWQM were updated with recently approved projects for the development of the 2025 IPA. The permitted mine plans are the site-specific mine plans comprised of approved permits that identify pit designs and mine rock placement for EVR's operations. Existing mine rock placement through to the end of 2023 was included in the 2025 IPA. The following additional future planned mine development projects that were undergoing regulatory review or were anticipated to be under review concurrently with the 2025 IPA (at the time that the mine plan inputs were cut-off) have been included in the 2025 IPA:

- GHO: Cougar 5 Project
- LCO: BRN Metallurgical Coal Optimization Project
- EVO: Natal Pit 2 Material Reallocation (NP2MR) Project

The following mine planning inputs were updated as appropriate based on the permitted and additional mine development projects included in the 2025 IPA; details on the updates to mine planning inputs are described in Hatch (2025c):

- mine rock placement schedule by drainage
- changes in topography, drainage boundaries and mining features due to advancing mine development (e.g., the creation of pits, mine rock spoils and the deposition of coal rejects), and
- water management activities (both operational and closure).

The site mine engineering teams routinely review and update mine plans. The mine plans may be adjusted based on a variety factors including new data collected through surveying, drill hole data, geotechnical analysis, and geological model interpretations. All changes to the permitted mine plans are assessed for their potential impact or benefit to the environmental and other EVR programs. The 2025 IPA is required to be developed based on the most up-to-date permitted mine plans; therefore, all permitted pits are included in the IPA. However, it should be noted that some permitted mining areas may not currently be included in the life of mine planning for various reasons including economics, reclamation research, and water quality management. These include future Henretta mining and portions of the Swift mining area (i.e., the rehandle of the Lake Mountain backfill and mining of underlying reserves).

Modifications to the permitted mine plan or inclusion of additional mine development projects that resulted in improvements to water quality are summarized in Table 2.1.

Table 2.1. Mine Plan Modifications to Support Improvements to Water Quality in the 2025 IPA.

Operation	Mine Plan Change	Description	Rationale
FRO	Reduction in future mine rock placement in Turnbull Bridge Spoil	Reallocation of 24 MBCM of future mine rock from the Turnbull Bridge Spoil to Swift North Spoil relative to permitted mine plan in the 2023 RWQM	No existing treatment or planned treatment intake for mine-influenced water from Turnbull Bridge Spoil due to anticipated challenges with water capture. More effectively utilizes existing treatment intakes and treatment capacity at FRO-N SRF (i.e., Post Ponds and Liverpool). Improvements to water quality in the upper Fording River.
	Delay in mine rock placement in Tower Diversion	Mine rock placement in Tower Diversion has been extended until the end of 2032	Tower Diversion is operational for a longer duration (until end of 2032) relative to the 2023 RWQM, which results in less water from Liverpool Pond required to convey for treatment at FRO-N SRF until 2032
	Reallocation of mine rock to backfilling in Swift Pit	A portion of mine rock was reallocated from the Swift North spoil to backfilling in Swift Pit	In-pit backfilling is considered a best practice
GHO	Removal of mine rock from the Porter Creek catchment	Relocation of 123 MBCM of mine rock from the Porter Creek catchment to in-pit backfill locations at GHO.	Included as part of the GHO Cougar 5 Project. Improvements to water quality in the upper Fording River watershed.
EVO	Reallocation of mine rock from EVO Dry Creek to Erickson Creek and in-pit spoils	Re-allocation of mine rock material currently permitted to be placed into the EVO Dry Creek Spoil to other alternative spoiling locations at EVO, including both in-pit (backfilling) and an existing ex-pit spoil that currently report to existing water treatment via EVO SRF.	Re-allocating material from Dry Creek is the major driver of the Natal Phase 2 Material Re-allocation (NP2MR) Project. Utilization of existing treatment intakes and/or treatment capacity at EVO SRF.

MBCM = million banked cubic metres.

A summary of existing and anticipated cumulative mine rock volumes through to the end of permitted mining activities is provided in Table 2.2.

Table 2.2. Cumulative Mine Rock Volumes in the 2025 IPA.

Operation	Mine Rock [million BCM] [1]	
	Existing [2]	Cumulative Permitted End of Mining
Fording River [3]	3,478	4,760
Greenhills[3]	1,063	1,428
Line Creek	1,000	1,547
Elkview	2,176	3,347
Coal Mountain	324	324
Total	**8,041**	**11,406**

[1] Annual mine rock placement schedules are included in Appendix A of Hatch (2025c).
[2] Actual mine rock volumes to the end of 2023.
[3] Mine rock placed in the Swift and Cataract watersheds by both Fording River and Greenhills are listed in this table as part of Fording River.
BCM = bank cubic metre.

Changes to site conditions considered in the 2025 IPA are outlined in Table 2-4 in Hatch (2025c), identifying how they compare to the information considered in the 2022 IPA and the 2023 RWQM.

2.2.3 Planning Basis and Assumptions

The 2025 IPA was developed based on refinements and additions to both the management decisions (i.e., the sources to target for treatment and how quickly treatment could be constructed) and inputs (i.e., the effluent quality from treatment, release rates, and water availability for treatment) used to set the 2022 IPA. These collectively constitute the planning basis on which the 2025 IPA was formed.

The planning basis and input assumptions were included as part of the 2025 IPA Terms of Reference (approved on May 12, 2025). The planning basis for the 2025 IPA is summarized in Table 2.3 and input assumptions for water treatment planning used to inform the 2025 IPA are summarized in Table 2.4. A summary table of input assumptions for water treatment planning, membrane partition coefficients, and brine management options from membrane treatment are provided in Table 2.5 and

Table 2.6, respectively.

Monthly average influent and effluent selenium and nitrate concentrations for the WLC AWTF, EVO SRF, FRO AWTF-S, and FRO-N SRF are summarized in Table 2.7, Table 2.8, Table 2.9, and Table 2.10, respectively, to support the assumptions related to treatment performance included in the 2025 IPA.

Table 2.3. 2025 IPA Planning Basis.

Parameter	Planning Basis	Rationale
Water Quality SPOs	SPOs at Order stations as described in Permit 107517	SPOs at Order stations were based on the long-term objectives from the EVWQP. They were set based on the effects benchmarks and integrated assessment completed for the EVWQP. Compliance is evaluated based on projected 90th percentile concentrations with existing and planned mitigation, as per standard approach for previous IPAs.
Water Quality Compliance Limits	Compliance limits at compliance points as described in Permit 107517	Compliance limits at compliance points were set based on the 2014 RWQM, and the IIP, which had limited data at some of the compliance points. Resulting modelled concentrations at compliance points will be compared to compliance limits. Compliance is evaluated based on projected 90th percentile concentrations with existing and planned mitigation, as per standard approach for previous IPAs.
Water Constituents	Selenium, nitrate, sulphate, and cadmium as described in Permit 107517	Includes all Order constituents.
Mine Plan	Permitted mine plan updated to incorporate recently approved mitigation and mine development projects, up to the end of June 2024	The permitted mine plan includes additional projects that were anticipated to be under regulatory review prior to 2025 IPA submission.
Water Management Plan	Mine water management plans as updated for the 2025 IPA	The most recent available mine water management plans for each operation, with updates incorporating recent permit applications and approvals and inclusive of optimizations to support the 2025 IPA.
Water Quality Model Projections	2023 RWQM as updated for the 2025 IPA	Refer to Section 3.2 Projected Water Quality
Flow Conditions	20 climate realizations based on historical climate data	Future flow projections were developed based on the previous 20 years (2003 to 2022) of historical climate data run repeatedly through the RWQM using a multi-realization approach.
Geochemical Release Rates	Catchment-specific average release rates as incorporated in the 2023 RWQM No decay of selenium or sulphate generation	These reflect current understanding of constituent transport and release Understanding of selenium and sulphate decay is preliminary and is not sufficient to support mitigation planning
Mitigation Measures	AWTF, SRF, membrane-HDS facilities, and CWDs where practical to support efficient treatment	Water treatment technologies include AWTFs, SRFs, and membrane-HDS facilities; AWTFs are consistent with the IIP, 2019 IPA, and 2022 IPA and SRFs are consistent with the 2022 IPA. Membrane-HDS facilities have been included in alignment with ongoing water treatment projects (i.e., LCO Line Creek and LCO Dry Creek AWTFs). Clean water diversions are included, where required and where practical to support efficient treatment.
Source Control	Nitrogen management source control measures related to lining blasting holes are accounted for in the 2025 IPA	Consistent with the modelling methods in the 2023 RWQM. No other source control measures will be included in the 2025 IPA.

Table 2.4. 2025 Implementation Plan Adjustment – Summary Table of Input Assumptions for Water Treatment Planning.

Parameter	Input	Rationale
Biological Tank-Based Treatment - Existing Facilities		
Treatment Type	Biological Treatment with AOP	Based on the addition of the AOP process to WLC AWTF, inclusion of AOP in the FRO AWTF-S
Hydraulic Capacity - WLC AWTF	Up to 7,500 m^3/day	As per current design.
Effluent Quality - WLC AWTF through end of 2025 - Selenium (total)	20 µg/L	Based on actual data / performance to date (influent and effluent will be updated in the 2025 IPA through the end of 2024) plus the addition of the AOP. Consistent with AOP Operational Permit application and end of pipe permit limits for the WLC AWTF.
Effluent Quality - WLC AWTF through end of 2025 - Nitrate	1 mg/L $N\text{-}NO_3$	Based on actual data/ performance to date plus the addition of the AOP. Consistent with AOP Operational Permit application and end of pipe permit limits for the WLC AWTF. Measured effluent data at WLC since operation were below 1 mg/L. (influent and effluent will be updated in the 2025 IPA through the end of 2024)
Nitrate Load Limit - WLC AWTF through the end of 2025	225 kg-$N\text{-}NO_3$/day	Reflects current operations.
Hydraulic Capacity - FRO AWTF-S	Up to 20,000 m^3/day	As per current design.
Effluent Quality - FRO AWTF-S through end of 2026 - Selenium (total)	30 µg/L	Based on actual performance of FRO AWTF-S.
Effluent Quality - FRO AWTF-S 2027 onwards - Selenium (total)	20 µg/L	Represents estimated improvements over time based on to-date FRO AWTF-S operational data.

Parameter	Input	Rationale
Effluent Quality - FRO AWTF-S - Nitrate	2 mg/L N-NO_3	Based on actual performance of FRO AWTF-S and model projected influent concentrations.
Nitrate Load Limit -FRO AWTF-S	1,400 kg-N-NO_3/day	Reflects current design specifications.
Biological Tank-Based Treatment – Permitting Underway (Brine Treatment at WLC AWTF)		
Effluent Quality - WLC AWTF 2026 onward - Selenium (total)	35 µg/L	Represents effluent concentration for selenium considering treatment of brine from the Line Creek RO-HDS Operations Application.
Effluent Quality - WLC AWTF 2026 onward - Nitrate	2.4 mg/L N-NO_3	Represents effluent concentration for nitrate considering treatment of brine from the Line Creek RO-HDS Operations Application.
Nitrate Load Limit – WLC AWTF – 2026 onward	600 kg-N-NO_3/day	Reflects influent nitrate load limit with treatment of brine from the LCO Line Creek RO-HDS facility.
Biological Tank-Based Treatment - Future Facilities		
Treatment Type	Biological Treatment with AOP	Based on the addition of the AOP process to WLC AWTF and FRO AWTF-S.
Effluent Quality (all new AWTFs) - Selenium (total)	20 µg/L	Represents estimated improvements over time based on to-date WLC AWTF and FRO AWTF-S operational data, to-date pilot test work, and focused R&D effort to improve AWTF selenium effluent concentrations.
Effluent Quality (all new AWTFs) - Nitrate	2 mg/L	Represents estimated improvements over time based on to-date WLC AWTF and FRO AWTF-S operational data, to-date pilot test work, and focused R&D effort to improve AWTF selenium effluent concentrations.
Saturated Rock Fill Treatment – Existing Facilities		
Hydraulic Capacity - EVO SRF Phase 1	Up to 20,000 m^3/day	Aligned with EVO SRF Phase 1 trial application and current operating capacity.
Hydraulic Capacity - FRO-N SRF Phase 2 through the end of 2025	Up to 30,000 m^3/day	Aligned with FRO-N SRF Phase 2 operations application.
SRF Load Removal – EVO SRF	95% removal of influent selenium and nitrate load	95% removal for EVO SRF Phase 2
SRF Load Removal – FRO-N SRF Phase 2, through the end of 2025	95% removal of influent selenium and nitrate load, including monthly influent load limits	Aligned with the FRO-N SRF Phase 2 operations application
Entrainment Water in SRF Effluent	Refer to SRK (2024)	Entrainment of recharge water was estimated for existing SRFs based on a load balance approach to quantify the exchange and mixing of the shallow and deep zones of existing SRFs. Detailed information on this method of estimating entrainment can be found in SRK (2024).
Saturated Rock Fill Treatment – Permitting Underway (FRO-N SRF Phases 3a and 3b)		
Hydraulic Capacity – FRO-N SRF Phase 3a	Up to 40,000 m^3/d	Aligned with the operations applications in preparation for FRO-N SRF Phase 3a.
Hydraulic Capacity – FRO-N Phase 3b	Up to 60,000 m^3/d	Aligned with the operations applications in preparation for FRO-N SRF Phase 3b.
SRF Load Removal – FRO-N SRF Phases 3a and 3b	95% removal of influent selenium and nitrate load	Aligned with the operations applications in preparation for FRO-N SRF Phases 3a and 3b.
Entrainment Water in SRF Effluent	Refer to SRK (2024)	Entrainment of recharge water was estimated for existing SRFs based on a load balance approach to quantify the exchange and mixing of the shallow and deep zones of existing SRFs. Detailed information on this method of estimating entrainment can be found in SRK (2024).
Saturated Rock Fill Treatment – Future Facilities		

Parameter	Input	Rationale
SRF Load Removal	95% removal of influent selenium and nitrate load	Design intent is based on the performance of FRO-N and EVO SRFs to date.
Entrainment Water in SRF Effluent	Refer to SRK (2024)	Entrainment of recharge water was estimated for future SRFs based on a load balance approach to quantify the exchange and mixing of the shallow and deep zones of future SRFs. Detailed information on this method of estimating entrainment can be found in SRK (2024).
Reverse Osmosis-High Density Sludge (RO-HDS) – Permitting Underway		
Sulphate Load Removal	Refer to Table 2.6	Aligned with the selenium, nitrate, sulphate and cadmium load removal rates presented in the LCO Line Creek and LCO Dry Creek water treatment applications using reverse osmosis-high density sludge treatment technology.
Reverse Osmosis-High Density Sludge – Future Treatment		
Sulphate Load Removal	Refer to Table 2.6	Aligned with the sulphate load removal rates presented in the LCO Dry Creek water treatment application using reverse osmosis-high density sludge treatment technology.
Clean Water Diversions		
Kilmarnock Creek Diversion	up to 86,000 m^3/day	Aligns with current design capacity.
Upper Line Creek/Horseshoe Creek	Refer to Table 3.2	Determined in the IPA (Section 3.1).
No Name Creek Diversion	Refer to Table 3.2	Determined in the IPA (Section 3.1).
Intake Water Collection		
Water Availability	Tributary specific	Surface water and groundwater partitioning in tributaries is defined as per the 2023 RWQM update.
Intake Design Criteria – Existing Intakes	Intake specific	Where existing intakes have existing characterization, design criteria, and considerations of actual operation are applied for the existing intakes, after considering surface water and groundwater availability and available treatment capacity at the treatment facilities.
Intake Collection Efficiency – Future Intakes	95%	The percentage of available flow that is captured by the intake. Intended as a factor of safety to reflect infrastructure capabilities to collect and convey water for treatment intakes that have not been characterized or do not yet have design criteria.
Outfall Locations		
Outfall Locations – Existing Outfalls	Facility specific	Where existing outfalls have existing characterization, design criteria, and considerations of actual operation are applied for the existing outfalls.
Outfall Locations – Future Outfalls	Facility specific	Water collected for treatment will be returned down-gradients of, and/or near to, the collection point, where required. The water is returned at the equivalent flow rate at which it was collected.
Nitrate Management		
Liner integrity assumption	99.5%	Consistent with the modelling methods in the 2023 RWQM.

Table 2.5. Membrane Treatment Partition Coefficients.

Constituent	Partition Coefficients		
	Primary Permeate	Final Brine	HDS Solids Residuals (Wet)
LCO Dry Creek Membrane-HDS Treatment			
Flow	>97.5%	<2%	0.5%
Nitrate	<5%	<91%	<4%
Selenium	<2%	<73%	>25%
Sulphate	<2%	>6%	>92%
Cadmium	<1%	<1%	>98%
LCO Line Creek Membrane-HDS Treatment			
Flow	High Recovery >93.4% Low Recovery >70%	High Recovery <5.6% Low Recovery <28.5%	High Recovery <1% Low Recovery <1.5%
Nitrate	High Recovery <10% Low Recovery >1.3%	High Recovery >88% Low Recovery <97.7%	High Recovery <2% Low Recovery 1%
Selenium	0.2%	<76.3%	>23.5%
Sulphate	High Recovery <0.5% Low Recovery >0.6%	High Recovery >5% Low Recovery Calculated[1]	High Recovery <94% Low Recovery Calculated[1]
Cadmium	0.8%	>0.2%	<99%
Future Sulphate Treatment			
Sulphate	<2%	>6%	>92%

[1] Low recovery brine assumed to be Influent[Sulphate] less permeate concentration up to a solubility limit of 2000 mg/L, when limit is exceeded, solids concentration = (100% - 0.6%) * Influent [Sulphate] – 2000 mg/L, else 0 mg/L.

Table 2.6. Brine Management in Membrane Treatment Assumptions Used for the 2025 IPA.

Membrane Treatment Project or Planning Basis	Brine Management	Net Load Removal at Membrane Treatment or Sulphate Treatment Facility
LCO Dry Creek Membrane-HDS	Off-site disposal of brine	Selenium: 98% Nitrate: 95% Sulphate: 98% Cadmium: 99%
LCO Line Creek Membrane-HDS	Brine conveyed for treatment at WLC AWTF	Selenium: 23.5%[1,2] Nitrate: 1%[1,2] Sulphate: Calculated[2,3] Cadmium: 99%[2]
Future sulphate treatment	Brine and permeate conveyed to selenium and nitrate treatment facility	Sulphate: 92% Nitrate, selenium, and cadmium: Influent concentration = effluent concentration[1]

[1] The load removal rates presented exclude load removal from subsequent selenium and nitrate treatment.
[2] Low recovery brine mode was used in the 2025 IPA for the LCO Line Creek RO-HDS facility, consistent with the LCO Line Creek Water Treatment Project (EVR 2024c).
[3] The net load removal for sulphate is equivalent to the partitioning coefficient for solids: Influent [sulphate] less permeate concentration up to a solubility limit of 2000 mg/L, when limit is exceeded, solids concentration = (100% - 0.6%) * Influent[Sulphate] – 2000 mg/L, else 0 mg/L.

Table 2.7. WLC AWTF Mean Monthly Influent and Effluent Concentrations.

Month-Year	WLC AWTF Influent Mean Total Selenium Concentration (µg/L)	WLC AWTF Effluent Mean Total Selenium Concentration (µg/L)	WLC AWTF Influent Mean Nitrate Concentration (mg/L)	WLC AWTF Effluent Mean Nitrate Concentration (mg/L)
Jun-22	187	6.8	6.7	0.23
Jul-22	221	5.1	8.0	0.25
Aug-22	282	10.6	10.6	0.22
Sep-22	276	7.7	12.8	0.23
Oct-22	255	9.3	13.5	0.23
Nov-22	254	11.1	14.1	0.24
Dec-22	245	10.4	14.8	0.22
Jan-23	231	14.1	15.2	0.22
Feb-23	234	9.6	15.7	0.22
Mar-23	249	15.0	17.8	0.22
Apr-23	248	24.1	18.7	0.22
May-23	251	17.9	9.2	0.23
Jun-23	237	8.9	8.2	0.22
Jul-23	186	6.6	8.0	0.22
Aug-23	116	9.3	7.2	0.23
Sep-23	217	5.1	11.9	0.22
Oct-23	205	5.7	12.9	0.22
Nov-23	193	5.5	12.6	0.22
Dec-23	197	4.7	14.3	0.24
Jan-24	186	15.4	14.6	0.27
Feb-24	195	10.8	16.4	0.28
Mar-24	195	16.6	16.6	0.22
Apr-24	194	14.2	14.3	0.22
May-24	89	11.9	6.1	0.22
Jun-24	**WLC AWTF Maintenance Shutdown**			
Jul-24	78	3.3	7.0	0.22
Aug-24	198	2.2	10.0	0.22
Sep-24	196	4.3	10.5	0.22
Oct-24	188	5.9	11.2	0.22
Nov-24	195	12.2	12.1	0.23
Dec-24	202	12.0	13.5	0.23

Table 2.8. EVO SRF Mean Monthly Influent and Effluent Concentrations.

Month-Year	EVO SRF Influent Mean Total Selenium Concentration (µg/L)	EVO SRF Effluent Mean Total Selenium Concentration (µg/L)	EVO SRF Influent Mean Nitrate Concentration (mg/L)	EVO SRF Effluent Mean Nitrate Concentration (mg/L)
Jun-22	149	2.4	24.7	0.22
Jul-22	156	2.2	24.6	0.19
Aug-22	150	2.0	24.3	0.17
Sep-22	148	1.8	25.0	0.18
Oct-22	155	1.6	19.0	0.24
Nov-22	165	1.9	21.3	0.16
Dec-22	175	1.9	21.8	0.11
Jan-23	182	1.8	22.5	0.08
Feb-23	188	1.7	23.0	0.11
Mar-23	192	1.7	22.4	0.07
Apr-23	202	1.4	22.9	0.06
May-23	188	1.4	21.4	0.04
Jun-23	189	1.8	21.9	0.07
Jul-23	166	2.1	22.0	0.09
Aug-23	178	1.2	22.0	0.06
Sep-23	150	1.5	23.7	0.06
Oct-23	147	1.5	18.1	0.06
Nov-23	179	1.9	21.1	0.07
Dec-23	176	2.3	20.6	0.08
Jan-24	185	2.0	21.5	0.08
Feb-24	183	2.1	20.4	0.10
Mar-24	171	2.6	21.5	0.08
Apr-24	158	2.5	24.8	0.07
May-24	166	1.6	19.0	0.09
Jun-24	162	2.2	19.4	0.10
Jul-24	152	2.3	20.4	0.05
Aug-24	151	1.8	20.9	0.07
Sep-24	161	1.7	24.1	0.07
Oct-24	159	2.9	19.9	0.09
Nov-24	160	2.9	21.8	0.10
Dec-24	168	3.5	18.7	0.13

Table 2.9. FRO AWTF-S Mean Monthly Influent and Effluent Concentrations.

Month/Year	Influent Mean Total Selenium Concentration (µg/L)	Effluent Mean Total Selenium Concentration (µg/L)	Influent Mean Nitrate Concentration (mg/L)	Effluent Mean Nitrate Concentration (mg/L)
Jul-22	291.7	10.4	43.4	0.2
Aug-22	395.3	15.2	51.6	1.4
Sep-22	401.2	21.6	64.7	0.2
Oct-22	471.3	20.5	69.6	0.2
Nov-22	493.3	19.9	77.9	0.2
Dec-22	540.8	20.2	75.6	0.2
Jan-23	529.6	21.9	96.6	0.2
Feb-23	576.6	25.6	98.7	0.3
Mar-23	572.8	28.5	100.3	0.3
Apr-23	580.8	24.0	90.6	0.3
May-23	593.1	23.2	61.5	0.5
Jun-23	**Facility was shut down for entire month**			
Jul-23	455.7	17.5	60.3	1.0
Aug-23	459.4	14.1	70.8	0.2
Sep-23	516.7	21.9	69.5	0.2
Oct-23	485.9	21.1	86.6	0.2
Nov-23	529.4	22.5	89.7	0.2
Dec-23	518.3	19.6	88.9	0.2
Jan-24	530.8	17.3	91.5	0.2
Feb-24	543.1	15.7	80.3	0.4
Mar-24	522.7	21.1	99.0	0.5
Apr-24	534.6	25.4	102.4	0.2
May-24	453.3	20.6	71.0	0.2
Jun-24	367.8	17.3	53.0	0.2
Jul-24	352.9	16.6	49.6	0.2
Aug-24	362.3	17.7	56.6	0.2
Sep-24	415.5	21.8	64.5	0.2
Oct-24	446.8	25.4	73.1	0.2
Nov-24	472.7	25.6	82.5	0.2
Dec-24	509.6	25.0	89.2	0.2

Table 2.10. FRO-N SRF Mean Monthly Influent and Effluent Concentrations.

Month/Year	Influent Mean Total Selenium Concentration (µg/L)	Effluent Mean Total Selenium Concentration (µg/L)	Influent Mean Nitrate Concentration (mg/L)	Effluent Mean Nitrate Concentration (mg/L)
Dec 10-31 2023	60.33	18.23	29.23	14.34
Jan-24	62.55	16.40	28.38	10.53
Feb-24	79.06	13.36	29.65	9.10
Mar-24	79.40	9.67	28.29	6.99
Apr-24	126.97	17.31	36.32	10.07
May-24	80.18	19.39	29.33	12.76
Jun-24	76.84	20.96	31.55	15.57
Jul-24	118.53	18.24	38.09	17.01
Aug-24	119.68	15.75	38.95	15.55
Sep-24	107.28	12.53	35.93	10.73
Oct-24	93.74	11.26	33.62	6.59
Nov-24	92.31	13.29	34.26	5.47
Dec-24	71.65	11.83	25.65	4.69

2.3 Water Quality Management

Water management best practices are fundamental aspects of water quality management planning and the 2025 IPA. During the development of the 2025 IPA, prevention was prioritized over treatment where possible.

2.3.1 Mine Water Management

Water management is key to the sustained future of EVR's operations. Managing the movement and discharge of mine-influenced and non-contact water to the receiving environment requires the implementation of effective strategies, activities and practices to meet site objectives and to support regional objectives, such as those outlined in the EVWQP and as updated in the 2025 IPA.

The objective of water management is to manage the movement and discharge of mine-influenced and non-contact water in order to:

- support safe and sustainable mining
- support geotechnical, water quality and quantity aspects
- mitigate impacts to the receiving environment and meet regulatory and permit compliance
- support the objectives of the EVWQP and IPA
- maximize the availability of water resources at the operations and downstream water use

The purpose of each site's Mine Water Management Plan (MWMP) is to describe how water is managed at site in order to remain consistent with the objective described above. The site MWMPs are expected to guide site personnel in making informed operational water management decisions.

Water management opportunities are considered in the 2025 IPA to offset treatment requirements where possible:

- water storage in backfilled pits prior to treatment to maximize utilization of treatment facilities

- clean water diversions (see Section 2.3.2)
- review of pumping rates to treatment facility intakes
- review collection of mine-influenced water in existing treatment facility intakes

2.3.2 Clean Water Diversions

The IIP included CWDs in three watersheds: FRO Kilmarnock Creek (including the upper Brownie catchment), LCO Line Creek (upper Line Creek, No Name Creek and Horseshoe Creek), and EVO Erickson Creek and Gate Creek. An evaluation of potential CWDs was completed to inform which to include in the 2019 IPA. The evaluation considered technical feasibility, operability and projected benefit to downstream water quality of different CWD configurations, which resulted in the inclusion of the diversions for FRO Kilmarnock Creek, LCO Upper Line Creek, LCO No Name Creek and LCO Horseshoe Creek.

Detailed diversion specific assessments will be completed for each future potential diversion as part of treatment projects that they are linked to. These assessments will be used to refine the efficacy of proposed CWDs, timing and capacity, as well as the construction and operating approach, for each CWD, providing a clear linkage with the design basis and permit application of the associated treatment. Consequently, this detailed assessment may change the configuration of individual CWDs and will be used to inform future adjustments to the implementation plan.

FRO Kilmarnock Creek Clean Water Diversion

The FRO Kilmarnock Creek CWD was constructed in 2020 and began operating in October 2021. To evaluate the effect of this CWD on constituent of interest loadings, a monitoring program has been implemented to collect high-quality surface water and groundwater data pre- and post-diversion.

The CWD is designed to divert water from the upper catchment of the Kilmarnock Creek, through a diversion pipeline, and back into the creek at a location downstream of the mine rock spoils. It comprises an intake structure connected to a gravity-fed pipeline with a design capacity of 86,000 m^3/d. The diversion is capable of transmitting more non-contact water than the design capacity; for instance, in June 2022, the operational maximum daily flow rate reached 128,500 m^3/d (Teck 2024). The intake structure is located above the spatial extent of mine rock spoiling in the basin within upper Kilmarnock Creek.

2.3.3 Nitrate Management

As part of EVR's commitment to improving water quality in the Elk Valley, EVR has been investigating means of managing nitrate releases from its steelmaking coal mining operations to reduce UU 1.6.2 (*What is the most feasible and effective method (or combination of methods) for source control of nitrate release*?).

Nitrate source control measures have been implemented at all EVR operations to reduce the impacts of blasting on nitrate concentrations downstream of mine discharge locations. Scoping level estimates of losses were made for each type of blasting product and practice used at EVR operations through a combination of literature review, laboratory testing, and field testing. This information was used to identify and prioritize best management practices. The following best management practices have been implemented and are incorporated into each sites Nitrogen Source Control Plans:

1. Eliminating the use of all augured emulsion (or regular viscosity emulsion) products and replaced with high viscosity emulsion: This method of loading blast holes causes blasting product to stick to the sides of the upper section of the blast hole, where it remains undetonated. In 2016, use of augured emulsion was eliminated.
2. Preferential loading of ammonium nitrate fuel oil (ANFO), dewatering of ammonium nitrate fuel oil blast holes, and use of liners in blast holes to minimize leaching to the receiving environment.

3. In 2019, EVR pioneered and implemented the process of lining wet blast holes to minimize leaching to the receiving environment.
4. Standardization of procedures to reduce blasting misfires and explosive losses in blast holes including limiting sleep time (i.e., the time explosives are in the blast hole before detonation). Reducing sleep time reduces the potential for explosives leaching when in contact with water. EVR sites limit sleep times of six days or less, compared to manufactures recommendations for sleep times of 15 days.

EVR continues to modify the blast hole lining processes to improve safety, efficiency, and is in the process of developing methods to test effectiveness of the lining process and develop more water-resistant emulsion products.

There have been new learnings on the sources of nitrogen in EVR's mine rock since the 2022 IPA that were included in the 2023 RWQM and carried forward into the 2025 IPA (EVR 2024b). In the 2023 RWQM, annual nitrate release rates were updated based on the consideration of two sources: i) explosives derived nitrogen, and ii) naturally occurring biogenic exchangeable ammonium. The 2025 IPA also includes 99.5% reduced nitrogen export from lined blast holes, consistent with the 2023 RWQM. A sensitivity analysis was completed on the effectiveness of lined blasting holes (Section 3.3.3).

Further information on nitrate management thru blasting processes can be found in EVR's annual AMP reports.

2.4 Water Mitigation Project Development and Permitting Process

The 2025 IPA outlines the timing, location and capacity of water treatment and other water quality mitigations of all current and proposed future water mitigations to meet overall compliance in Permit 107517 and aligned with the objectives in the EVWQP. The 2025 IPA is a guide to identify the operational date, sources for treatment, and preliminary capacity of the individual water mitigation projects required to support the EVWQP which are then executed in alignment with the plan and adjusted based on site specific considerations and knowledge gains through the project execution. Water mitigation projects and timelines vary depending on the type of mitigation, technologies, capacity, and site-specific considerations. Despite this variation, all water mitigation projects follow the same key steps:

- Site investigations, baseline data collection to support engineering design and permitting information needs
- Engineering design
- Environmental assessments
- Permitting
- Procurement and Construction
- Pre-Commissioning and Commissioning

Environmental and engineering site investigations and baseline data are required to refine the objective of the mitigation and to understand any potential environmental impacts. In accordance with BC guidance, permitting of a water mitigation project requires two years of baseline data. One full year of data covering a full range of seasons is required to inform engineering design, the second year required to support permitting and construction. Engineering site investigations include activities such as pit characterization work for SRFs and geotechnical studies. Environmental site investigations include baseline data collected for both water quality and quantity (surface and ground), climate, terrestrial, aquatic and fish and fish habitat. These data inform water quality and quantity modelling as well as aquatic and terrestrial health assessments.

The site investigations support the engineering design in which a technology option assessment is completed. Based on the site conditions and treatment objectives treatment technologies are considered based on their level of maturity; safety; environmental risk; the ability to achieve the required effluent quality; the ability to permit; constructability; operability and reliability; costs; alignment with closure and reclamation objectives.

The environmental site investigations provide the basis for the environmental assessments and the water quality and quantity modelling. The water model is an input to the engineering design to define the source water location (including seasonal water availability and flow rates) and refined mitigation capacity.

The projects are governed by the EVR Project Management Standard, which includes the Scoping, Concept, Prefeasibility, Feasibility, Execution Readiness and Execution Phases. This additional governance ensures that the required design and baseline data collection requirements are met before advancing the project to the next phase, increasing clarity in execution. Project permitting requirements are guided by provincial and federal authorization information needs and vary depending on the scope, scale and nature of the water mitigation project. Provincial and federal authorisations to support construction (including instream activities) and operations include Feasibility study deliverables with approval timelines of approximately 12 months. EVR follows the BC published guidance outlining information requirements to support obtaining required authorizations and depending on the complexity of the project.

Construction activities are scheduled to avoid seasonal constraints including confining instream work to the least risk work window for fish; and vegetation clearing outside of the bird nesting window. The regulatory acts which determine these windows are important considerations in the mitigation construction schedule as are the water management strategies required to manage any environmental impacts during construction. Further, construction activities are integrated with other operational needs of mining operations and other seasonal constraints.

Pre-commissioning activities are completed to test equipment prior to the Transfer of Care, Custody and Control (TCCC), which marks the project's completion. Commissioning of the facility is then completed to bring the mitigation online, which is required to protect human health, to manage any environmental risks and to identify any issues which will prevent the mitigation from operating at full capacity. The commissioning and operation ramp-up time has been modelled as a sensitivity as outlined in Section 3.3.1.

Conceptual project overview schedules for the identified mitigations, including SRF, AWTF, and Membrane facilities, are shown in Figure 2.1, Figure 2.2 and Figure 2.3, respectively. Based on the required site investigations, baseline data collection, permitting, design and project governance requirements, expansion and new facilities have the same project overview schedule. More detailed project schedules are developed uniquely for specific projects as they advance.

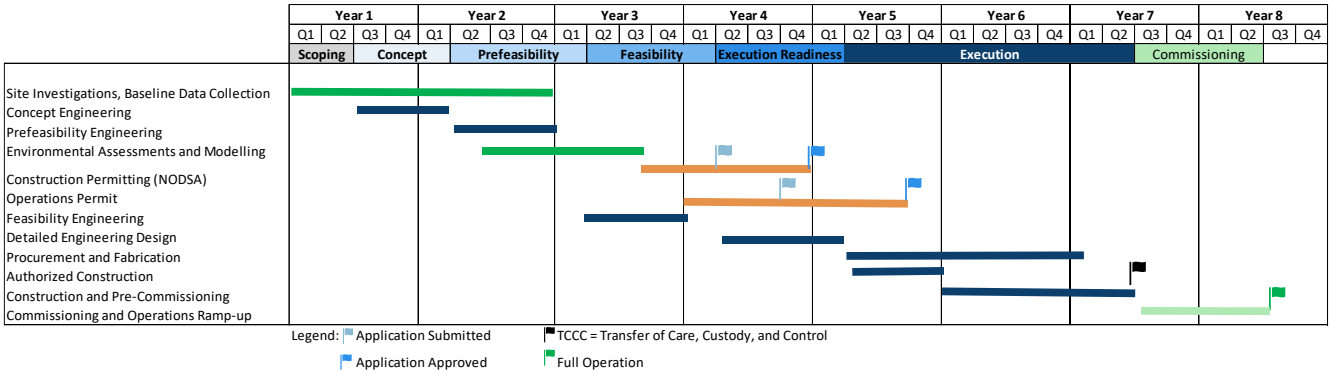


Figure 2.1. Conceptual Overview Schedule of SRF Facility.

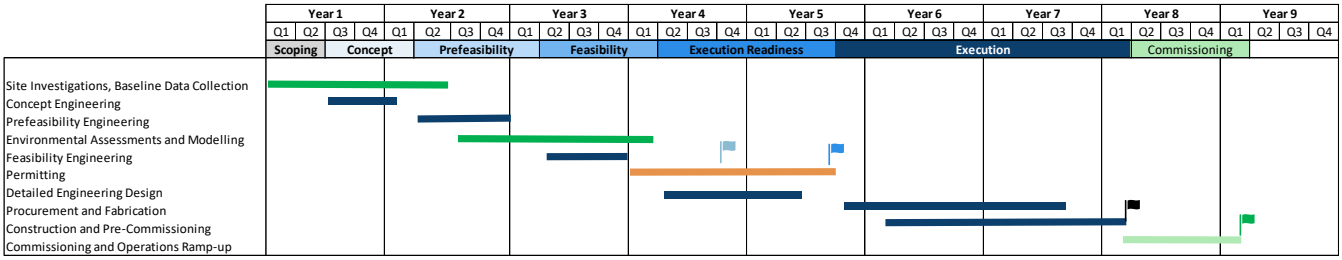


Figure 2.2. Conceptual Overview Schedule of AWTF.

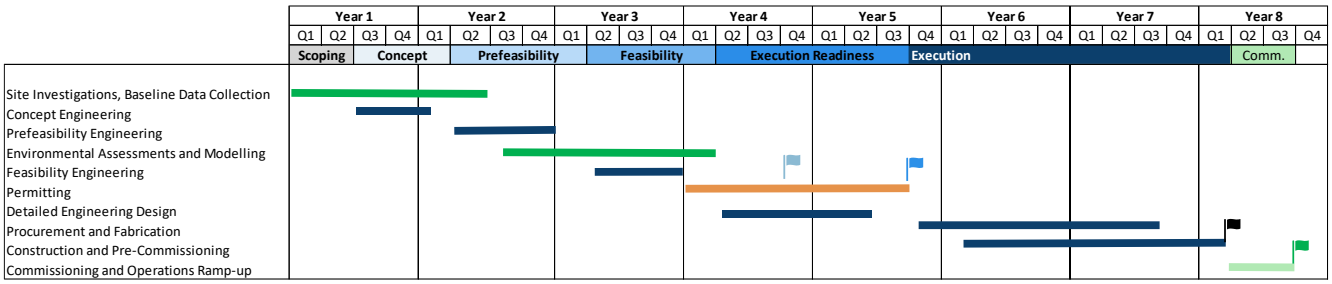


Figure 2.3. Conceptual Overview Schedule of a Membrane Treatment Facility.

2.5 Identification of Future Mitigation Technologies

EVR's Research and Technology Development (R&D) program was initiated in 2012 and is a requirement stipulated in Permit 107517 (ENV 2014). Source control is a major focus of EVR's R&D program; research is conducted under KU 1.6 (*Are there viable mine design and planning approaches that can reduce release of constituents of interest into the watershed?)* and it's three UUs:

- UU 1.6.2 - *What is the most feasible and effective method [or combination of methods] for source control of nitrate release*?
- UU 1.6.4 *Can treatment zones be built into waste rock dumps so that constituents of interest can be removed before entering the receiving environment?* and
- UU 1.6.5 *Are there ways to construct waste rock dumps that materially reduce the rate of oxidation of constituents of interest*?

For further detail on the study design, refer to Section 3.1.3 in the AMP update (EVR 2024a).

Source Control Initiatives

A suboxic zone (SOZ) is a zone where oxygen resupply into a mine rock spoil has been reduced resulting in suboxic conditions that decrease the rate of pyrite oxidation and associated loading rates of oxidation products to seepage emanating from the mine rock pile. Under these conditions, biogeochemical reduction and attenuation of already soluble constituents in mine rock seepage may also occur. Purpose-built SOZs within a mine rock pile offer a potential source control strategy for reducing selenium and nitrate loading.

The EVR R&D program has two studies in progress to characterize the conditions under which suboxia develops at a scale that is practical for integrating SOZ-focused designs into future mine rock pile designs. EVRs first full-scale trial of SOZs is the Cedar North mine rock spoil at EVO which contains engineered structures designed to limit oxygen resupply and promote suboxia. Construction of the Cedar North SOZ was completed in 2022 and monitoring has commenced.

A second SOZ trial is under construction at FRO Swift North. Construction continues on Swift North suboxic zone in 2025 and is expected to continue at pace with spoil progression until at least the end of 2026.

Other source control technologies have and continue to be evaluated by EVR, including:

- Use of Amendments for Geochemical Stability
- Basal Layer Tank Study
- Alternative Construction for Mine Rock Piles

The use of amendments for geochemical stability study has focused on evaluating the potential use of on and off site materials as amendments by conducting bench-scale testing as preparation for potential future field-scale pilot testing. Results from this study highlighted the complexity of biogeochemical systems in an unsaturated environment but showed promise for further assessment as the column leachates measured some selenium and nitrate attenuation, though removal consistency and replication were challenging. Column decommissioning, along with column modifications, extensions on select columns and small batch experiments to resolve additional uncertainties continue.

From the initial bench-scale amendments study, basal layer technology was selected to advance to the next scale to research and the Basal Layer Tank Study was initiated. Basal layer technology refers to the placement of laterally extensive layer(s) of pure or co-mingled on-site materials (herein referred to as basal layers) constructed within the spoil. An intermediate scale tank-based field trial was designed to further assess the ability of selected basal layer materials to decrease oxygen, develop suboxic conditions, and attenuate selenium and nitrate. The trial was constructed in 2025 and has an operational season from spring to fall. The first operation began in spring 2025 and the trial is planned to run for at least two seasons. Continuation and modifications to the study will be considered as the results are obtained and interpreted.

Work began in 2020 to identify and assess alternative construction methods for future end-dumped and bottom-up mine rock that could reduce advective gas transport, manage contact water flow paths, or create SOZs within the piles under the conditions present in the Elk Valley. Various alternative construction methods were selected for the initial comparative modelling study, including configurations of top caps, toe berms, and apron layers. Results from the initial modelling showed promise for some alternative construction methods and more work continues in this area to improve model inputs, assess constructability potential, and conduct site-specific application assessments.

Source control for nitrate release is discussed in Section 2.3.3. Annual reporting on activities to reduce R&D KUs is provided in annual AMP reports.

3 2025 Implementation Plan Adjustment

3.1 Mitigation Plan and Summary of Updates to the Implementation Plan

The mitigations outlined in the 2025 IPA is EVR's water quality mitigation plan for the management of selenium, nitrate, sulphate and cadmium. Significant progress has been made in the management of water quality in the Elk Valley and the majority of the treatment included in the 2025 IPA is either operational or in the advanced stages of construction and permitting. EVR has four operating water treatment facilities (two AWTFs and two SRFs) in the Elk Valley. EVR has four fully commissioned and operating water treatment facilities, one at each of the Line Creek Operations (LCO) and Elkview Operations (EVO) and two at the Fording River Operations (FRO). In addition to these operating facilities, EVR is currently in the advanced stages of construction of a new facility at LCO and making substantial upgrades and expansion to the other existing facility at LCO, and both will be operational in 2026. Further, two expansions are in progress for a FRO facility (the first expansion is

currently under review and will be operational by the end of 2025 and the second expansion is in the advanced planning stage and will be operational at the end of 2026). These facilities and expansions form the basis for the 2025 IPA and the future mitigations proposed were optimized, in an iterative manner, to support a feasible plan to maintain long-term nitrate, selenium, sulphate and cadmium compliance with water quality limits and SPOs.

This section includes a overview of the mitigations included in the 2025 IPA; the current and planned treatment for selenium, nitrate and sulphate (Table 3.1); projected selenium, nitrate, and sulphate concentrations at each Order station and compliance point (including a compliance evaluation); an overview of the results of the sensitivity analyses; and an overview of the outcome of the assessment of potential ecological effects. Cadmium treatment is included in the 2025 IPA for existing projects with load removal rates for cadmium (i.e., membrane based treatment facilities); no cadmium treatment was identified to be required at other locations.

Nitrate and selenium water treatment facilities that are operational (WLC AWTF, EVO SRF Phase 2, FRO AWTF-S, and FRO-N SRF Phase 2), and construction and permitting (i.e., upgrades to WLC AWTF, LCO Dry Creek AWTF and FRO-N SRF Phase 3a/b) have been included in the 2025 IPA. Source prioritization was also reviewed for these existing facilities where appropriate. Clean water diversions are evaluated on a project-by-project basis and, where feasible, are included in the mitigation plan. Storage options are also incorporated into the mitigation plan, where feasible, to support improved utilization of existing and future treatment facilities. Additional treatment capacity required to support compliance was considered in future phases of treatment, as the hydraulic capacities of existing built facilities has already been set.

The 2025 IPA includes sulphate treatment through the water treatment facilities that are under construction at LCO, based on the design of these facilities, and an estimate of the future sulphate treatment requirements (location, timing and capacity) at FRO to support stabilization of sulphate concentrations below the long-term compliance limits and SPOs in the upper Fording River, based on the selection of a membrane-HDS treatment process (described in Section 2.1.2).

The second phase of treatment included in the 2025 IPA for LCO Dry Creek is in accordance with Condition 4F2 in Permit 107517 (operational date and effective hydraulic capacity) and is currently assumed to be an expansion of the membrane-HDS facility that is currently under construction at this location.

There are several noteworthy changes in the 2025 IPA compared to the 2022 IPA that are driven by one or more of the following factors: (1) optimized water management planning (i.e., storage), (2) the amalgamation of sulphate treatment with selenium and nitrate treatment, (3) improvements in the RWQM, and (4) changes to the mine plans. Here is a summary of the changes between the 2022 and 2025 IPAs:

- *Improved treatment utilization and reduced treatment capacity at FRO*: One of the primary goals of the 2025 IPA was the focus on improved water treatment facility utilization through the optimization of storage. This change has resulted in planning for more efficient use of existing and near-term planned facilities and a reduction in the number of new future facilities through the storage of source water during higher flow periods and the subsequent treatment of this water during lower flow periods when treatment capacity would otherwise be under utilized. This resulted in the elimination of both phases of the Eagle 6 SRF and a future expansion of the FRO-N SRF from the mitigation plan for FRO.
- *Reduction in new and stand-alone treatment facilities at LCO*: The amalgamation of treatment of sulphate with the treatment of selenium and nitrate resulted in the elimination of two phases of the NLC SRF and two stand-alone sulphate treatment facilities (with multiple additional phases) at LCO.
- *Reduction of treatment requirements at GHO*: The 2025 IPA does not include treatment for Greenhills Creek as no treatment is required at this location in any capacity to achieve compliance in either the Elk River or the Fording River. This change does not impact the timing for compliance in the Fording River. This is driven by the improvement in upstream treatment efficiency at FRO and more treatment capacity in LCO Dry Creek. Further, the changes in the 2023 RWQM have reduced required hydraulic capacity of the Cougar South Pit SRF.

- *Reduction in treatment at EVO due to the combination of mine plan changes and improvements in the RWQM representation of flow in Ericksons Creek*: all 2022 IPA future proposed treatment was eliminated for EVO Dry Creek, including two expansions to the EVO SRF and stand-alone sulphate treatment, due to the re-allocation of permitted rock from Dry Creek Spoil to either the Erickson drainage or into in-pit backfills (per the NP2MR Project). Additionally, the range in the hydrograph for Erickson was better constrained in the 2023 RWQM update, resulting in a greater proportion of flow being captured and treated with the current EVO SRF; resulting in the elimination of the next expansion that was planned in the 2022 IPA for 2027 and also the elimination of the Baldy Ridge Pit SRF.

A summary of the 2025 IPA nitrate, selenium, sulphate and cadmium treatment plan is provided in Table 3.1 and the CWDs are provided in Table 3.2. The locations of the treatment facilities in the 2025 IPA are provided in Figure 3.1.

Table 3.1. 2025 Implementation Plan Adjustment - Table of Treatment.

Site	Treatment Facility (Phase) [1]	Abbreviation on Graphs	Hydraulic Capacity Up To (m^3/d)	Operational Date [2]	Sources Treated /Added	Order Constituents Treated
FRO	**FRO AWTF-S**	FRO S	20,000	Sep 1, 2022	Swift/Cataract, Kilmarnock	Selenium, nitrate
	FRO-N SRF (Phase 2)	FRO N2	30,000	Dec 31, 2023	Post Pond, Eagle 4 (E4) Pit, Eagle 6 (E6) Pit, Liverpool	Selenium, nitrate
	FRO-N SRF (Phase 3a)	FRO N3a	10,000	Dec 31, 2025	Post Pond, E4 Pit, E6 Pit, Liverpool	Selenium, nitrate
	FRO-N SRF (Phase 3b)	FRO N3b	20,000	Dec 31, 2026	Post Pond, E4 Pit, E6 Pit, Liverpool, Swift Pit, Kilmarnock SW/GW	Selenium, nitrate
	FRO Sulphate Treatment [3]	FRO SO4	17,000	Dec 31, 2034	Post Pond, E4 Pit, E6 Pit, Liverpool, Swift Pit, Kilmarnock SW/GW	Sulphate
LCO	**WLC AWTF**	WLC	7,500	Jan 1, 2020 – Oct 1, 2026	West Line Creek (WLC), Line Creek	Selenium, nitrate
	LCO AWTF [4]	LCO	17,500	Oct 1, 2026	WLC, NLC Pit, MSAW Pit, Line Creek	Selenium, nitrate, sulphate, cadmium
	LCO Dry Creek AWTF (Phase 1)	LCO DC1	10,000	Dec 31, 2026	Dry Creek	Selenium, nitrate, sulphate, cadmium
	LCO Dry Creek AWTF (Phase 2) [5]	LCO DC2	12,000	Dec 31, 2030	Dry Creek	Selenium, nitrate, sulphate, cadmium
	North Line Creek (NLC) SRF	NLC	1,000	Dec 31, 2033	NLC Pit, MSAW Pit	Selenium, nitrate
GHO	Cougar South Pit SRF	CSP	3,000	Dec 31, 2041	Leask Creek, Wolfram Creek, Thompson Creek	Selenium, nitrate
EVO	**EVO SRF (Phase 2)**	EVO 2	20,000	Sep 1, 2021	Erickson, Natal	Selenium, nitrate
	EVO SRF (Phase 3)	EVO 3	3,000	Jan 1, 2082	Erickson, Natal	Selenium, nitrate
Total Estimated Hydraulic Capacity up to (m^3/d)			163,500			

[1] Treatment facilities in bold are currently either in operation or under construction.
[2] The operational date is the date when facility commissioning activities are completed.
[3] The treatment assumptions for sulphate removal are limited to sulphate for this treatment facility for the purposes of the 2025 IPA; load removal for selenium, nitrate and cadmium will be considered through more detailed project planning phases.
[4] This treatment facility is a combination of the existing WLC AWTF biological treatment with a membrane-HDS treatment and the hydraulic capacity listed in the table applies to selenium and nitrate treatment; the component that specifically treats for sulphate and cadmium is up to 14,300 m^3/d hydraulic capacity.
[5] The LCO Dry Creek AWTF Phase 2 is included as per design capacity and mechanical completion date outlined in Permit 107517 Appendix 4F – Line Creek Operations Dry Creek and also in *Mine Act* Permit C-129. An amendment request can be made by EVR that, if approved, could result in a change to this date and/or treatment technology.

Table 3.2. 2025 Implementation Plan Adjustment – Clean Water Diversions Summary.

Clean Water Diversion	Associated Water Treatment Facility	Operational Date	Streams and Volume Diverted
Kilmarnock Creek	FRO AWTF-S	In place and operating	Upper Kilmarnock Watershed, up to 86,000 m^3/d
No Name Creeks	LCO AWTF	November 1, 2025 [1]	No Name Creek estimated at 120,000 m^3/d.
Upper Line Creek and Horseshoe Creek [2]	LCO NLC SRF	December 31, 2033	Upper Line Creek and Horseshoe Creek estimated at 35,000 m^3/d

[1] The operational date for the LCO No Name Creek Diversion is assumed to be consistent with the operational date of the LCO AWTF (i.e., October 1, 2026) for modelling purposes in the 2025 IPA.

[2] The efficacy of the CWDs at LCO are being evaluated with the next phase of treatment at this operation and adjustments to the diversion strategy may be made based on feasibility and environmental effects. These diversions are not projected to be required to support compliance at the Line Creek Compliance Point.

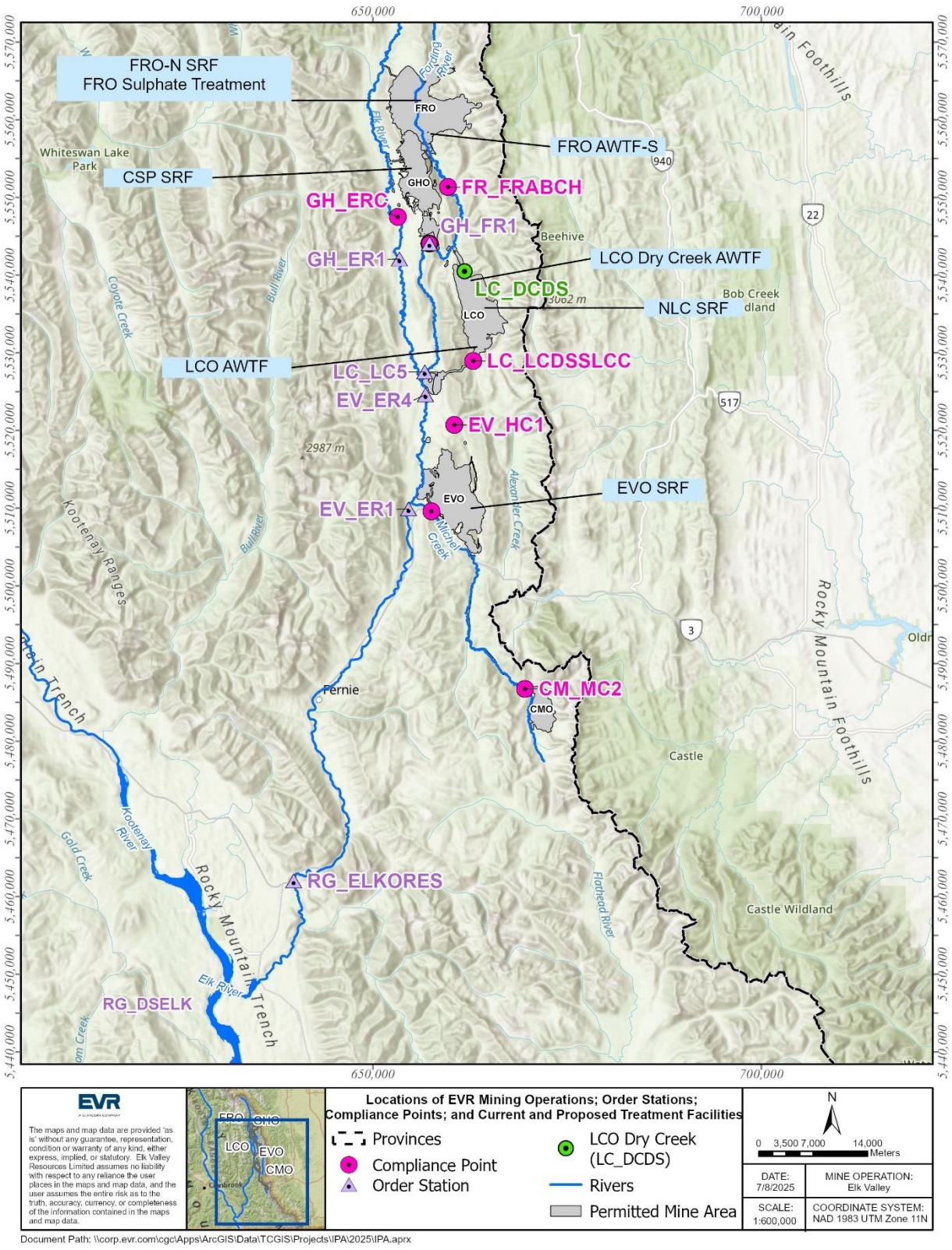


Figure 3.1. Locations of Current and Proposed Treatment Facilities in the 2025 IPA.

3.2 Projected Water Quality

This section includes the outcomes of the compliance evaluation for the 2025 IPA projections and the water quality projection plots for nitrate, selenium and sulphate for each of the Order stations and compliance points and the LCO Dry Creek water quality monitoring location. This is the three-year evaluation under Management Objective 1.

3.2.1 Compliance Evaluation

Compliance for selenium and nitrate is currently achieved and is projected to be maintained at the Elk River upstream of Boivin (GH_ER1; E206661), Elk River downstream of Michel Creek (EV_ER1; 0200393), Elk River at Elko Reservoir (RG_ELKORES; E294312) and Koocanusa Reservoir (RG_DSELK; E300230) Order stations and at the following compliance points: GHO Elk River Compliance Point (GH_ERC; 300090), EVO Harmer Creek Compliance Point (EV_HC1; E102682), CMm Compliance Point (CM_MC2; E258937), and EVO Michel Creek Compliance Point (EV_MC2; E300091). Selenium and nitrate concentrations will be at or below SPOs and compliance limits at all seven Order stations and all seven compliance points following the commissioning of the FRO-N SRF Phase 3b. As treatment facilities are commissioned, selenium and nitrate concentrations will continue to decrease and compliance is projected to be achieved at all locations by mid-2027 onward, but in varying years by location, as summarized in Table 3.3.

Compliance for sulphate is currently achieved at all Order stations and compliance points and projected to be maintained at these locations, with the exception of FRO Compliance Point (FR_FRABCH; E223753) and the Order station/Compliance Point at the Fording River downstream of Greenhills Creek (GH_FR1; 0200378). Sulphate concentrations will be at or below SPOs and compliance limits at all seven Order stations and all seven compliance points following the commissioning of the FRO Sulphate Treatment facility (Table 3.6).

Cadmium concentrations are currently below SPOs and is projected to remain below at the Order stations and compliance points.

Table 3.3. Summary of Projected Timing for Selenium, Nitrate, Sulphate, and Cadmium Compliance with Permit 107517

Type	Location	Compliance Projected to be Achieved by:			
		Selenium	Nitrate	Sulphate	Cadmium
Order Station	Fording River downstream of Greenhills Creek (GH_FR1; 0200378)[1]	Mid-2026 onward	In compliance	Mid-2035 onward[2]	In compliance
	Fording River downstream of Line Creek (LC_LC5; 0200028)	Mid-2027 onward	In compliance	In compliance	In compliance
	Elk River upstream of Grave Creek (EV_ER4; 0200027)	Mid-2027 onward	Mid-2027 onward	In compliance	In compliance
Compliance Point	FRO Compliance Point (FR_FRABCH; E223753)	Mid-2027 onward	Mid-2027 onward	Mid-2035 onward[3]	In compliance
	GHO Fording River Compliance Point (GH_FR1; 0200378)[1]	Mid-2026 onward	Mid-2026 onward	-	In compliance
	LCO Compliance Point (LC_LCDSSLCC; E297110)	Mid-2026 onward	Mid-2026 onward	In compliance	In compliance

[1] GHO Fording River Compliance Point (GH_FR1; 0200378) is also an Order Station. Comparison to each compliance limit and SPO is presented.

[2] P_{90} monthly average concentrations are projected to exceed the SPO from March to April in 2032 and 2035, and from February to April in 2033 and 2034.

[3] P_{90} monthly average concentrations are projected to exceed the Compliance Limit in March of 2029, 2031 and 2035, from February to April in 2032 and 2034, and January to April in 2033.

3.2.2 Projected Concentrations

The selenium, nitrate and sulphate projections are presented in this section along with a more detailed summary of compliance. Projected monthly average concentrations of selenium, nitrate and sulphate at Order stations, compliance points, and in LCO Dry Creek are shown in Figure 3.2 to Figure 3.10, respectively. The projections on the plots included in this section extend to 2057.

The format of the figures is as follows:

- The x-axis runs from the start of 2012 to the end of 2057. The start year (i.e., 2012) marked the beginning of the development of the Area Based Management Plan for the Elk Valley, while the end year (i.e., 2057) extends the timeline by four years beyond what was considered in the 2022 IPA (i.e., 2053).
- Projected 10th percentile (P_{10}), 50th percentile (P_{50}), and 90th percentile (P_{90}) monthly average concentrations produced using the 2023 RWQM are shown as solid orange, blue and grey lines, respectively.
- Measured monthly average concentrations are shown as green points.
- Modelled information shown prior to 2022 was developed based on calibrated flows. Those shown thereafter were developed using multiple climate realizations, as described in the 2020 update (Teck 2021).
- Compliance limits are shown as a solid black line, SPOs and targeted receiving environment objectives are shown as a dashed green line.
- The operational dates for the treatment facilities are shown as a vertical blue line.

3.2.2.1 Nitrate Projections

Order Stations

Monthly average nitrate concentrations are projected to meet SPOs at the following Order Stations (Figure 3.2):

- Fording River downstream of Greenhills Creek (GH_FR1; 0200378)
- Fording River downstream of Line Creek (LC_LC5; 0200028)
- Elk River upstream of Boivin Creek (GH_ER1; 020661)
- Elk River downstream of Michel Creek (EV_ER1; 0200393)
- Elk River at Elko Reservoir (RG_ELKORES; E294312)
- Koocanusa Reservoir (RG_DSELK; E300230)

Monthly average nitrate concentrations are also projected to meet long-term SPOs at the remaining Order stations, as follows (Figure 3.2):

- Elk River upstream of Grave Creek (EV_ER4; 0200027) – mid-2027 onward after commissioning of the FRO-N SRF 3b

Prior to the commissioning of these facilities, monthly average nitrate concentrations at the three aforementioned Order stations are projected to be higher than SPOs seasonally. This information is summarized in Table 3.4.

Compliance Points

Monthly average nitrate concentrations are projected to meet compliance limits at the following compliance points (Figure 3.3):

- GHO Elk River Compliance Point (GH_ERC; E300090)
- CMO Compliance Point (CM_MC2; E258937)
- EVO Harmer Compliance Point (EV_HC1; E102682)
- EVO Michel Creek Compliance Point (EV_MC2; E300091)

Monthly average nitrate concentrations are also projected to meet compliance limits at the remaining compliance points, as follows (Figure 3.3):

- FRO Compliance Point (FR_FRABCH; E223753) – mid-2027 onward, after commissioning of the FRO-N SRF 3b
- GHO Fording River Compliance Point (GH_FR1; 0200378) – mid-2026 onward, after the commissioning of FRO-N SRF Phase 3b,
- LCO Compliance Point (LC_LCDSSLCC; E297110) – 2026 onward, after the commissioning of the LCO AWTF.

Between 2025 and 2027, monthly average nitrate concentrations at the three aforementioned locations are projected to be higher than compliance limits. At all four locations, monthly projected nitrate concentrations are following a downward trend.

LCO Dry Creek

The current nitrate limit (Permit 107517) in LCO Dry Creek is subject to change following the review of the LCO Dry Creek Water Treatment Project application, therefore a compliance evaluation has not been completed.

However, for reference, predicted monthly average nitrate concentrations, along with the current limit are provided in Figure 3.4.

Table 3.4. Summary of Projected Monthly Average Nitrate Concentrations above Permit 107517 SPOs or Compliance Limits between 2025 and 2125.

Type	Location	Year [1]	Month	Maximum Projected Concentration (mg/L)	Corresponding SPO / Limit (mg/L)	Maximum Magnitude of Exceedance (mg/L)
Order Stations	Elk River upstream of Grave Creek (EV_ER4; 0200027)	2025	January to May, December	5.3	4.0	1.3
		2026	January to May, October to December	4.9	3.5	1.4
		2027	January to April	4.5	3.5	1.0
Compliance Points	FRO Compliance Point (FR_FRABCH; E223753)	2025	January to May; July to December	20.5	12.0	8.5
		2026	January to April, August, September, and December	17.6	12.0	5.6
		2027	January to March	13.6	12.0	1.6
	GHO Fording River Compliance Point (GH_FR1; 0200378)	2025	January to May	14.1	11.0	3.1
		2026	February to April	12.2	11.0	1.2
	LCO Compliance Point (LC_LCDSSLCC; E297110)	2025	January to May, November and December	10.2	7.0	3.2
		2026	January to May	9.9	7.0	2.9

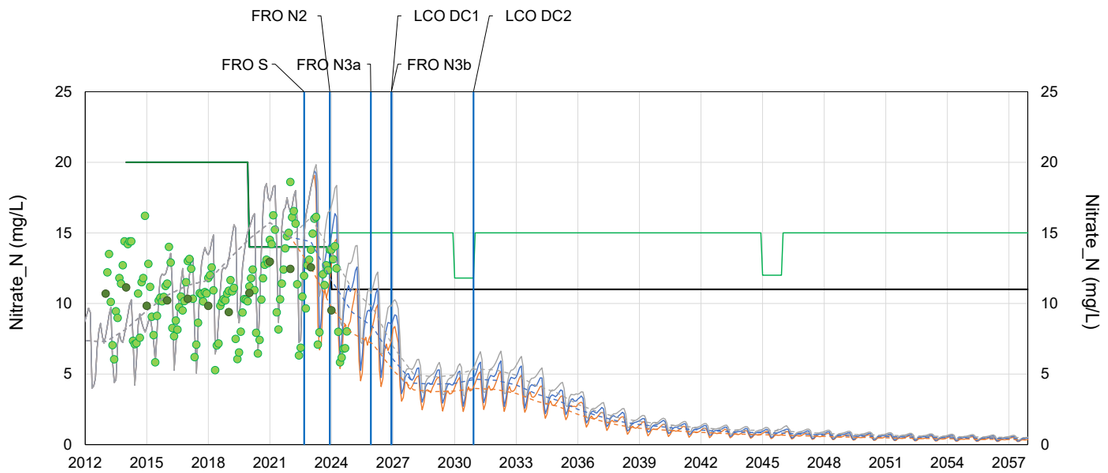
Note: mg/L = milligrams per liter.

[1] Compliance summary is for 2025 and onward; historical compliance is based on monthly average concentrations for samples collected at the Order stations and compliance points.

[2] SPOs for nitrate at GH_FR1 as of 2023 are hardness dependent based on the following formula: Level 1 benchmark for the Fording River N as mg/L = $10^{1.0003\log10(\text{hardness})-1.52}$ where hardness is in mg/L of CaCO3. Values in the table above were calculated based on a hardness of 360 mg/L.

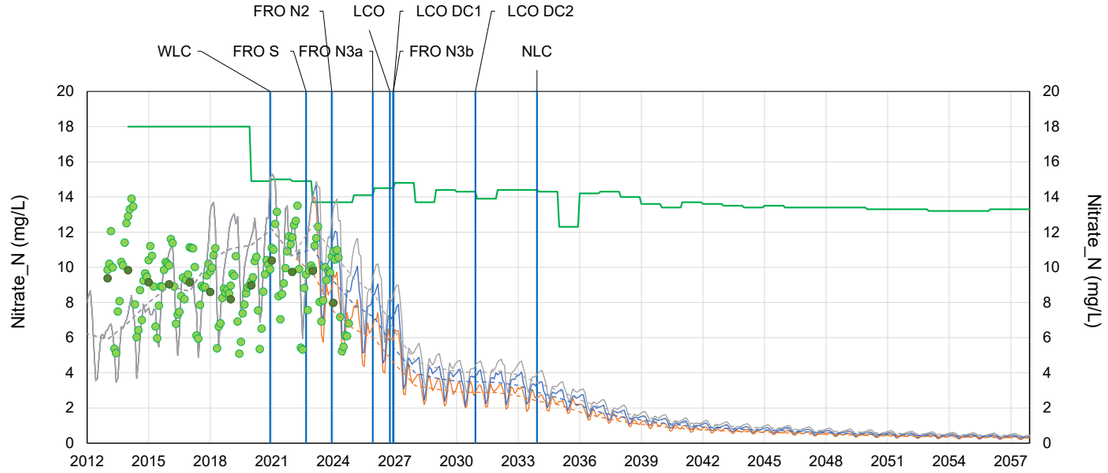
Figure 3.2. Projected Monthly Average Nitrate Concentrations at Order Stations from 2012 to 2057.

(a) Fording River downstream of Greenhills Creek (GH_FR1; 0200378)



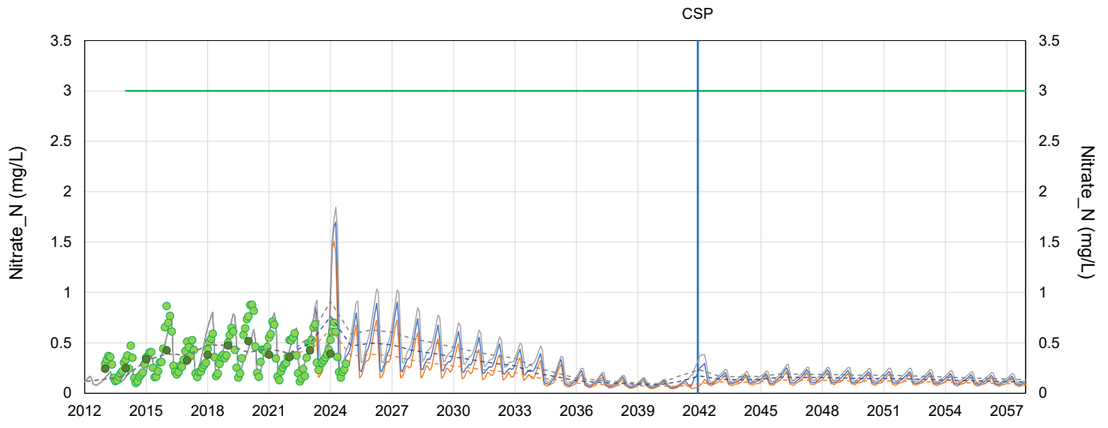
Note: This location is also the GHO Fording River Compliance Point. Site Performance Objective is hardness dependent from 2023 onward and is calculated using the following formula: N (in mg-N/L) = $10^{1.0003\log10(\text{hardness})-1.52}$ where hardness is in mg/L of $CaCO_3$.; it varies with time to reflect projected hardness concentrations in the month when maximum monthly nitrate concentrations are projected to occur.

(b) Fording River downstream of Line Creek (LC_LC5; 0200028)

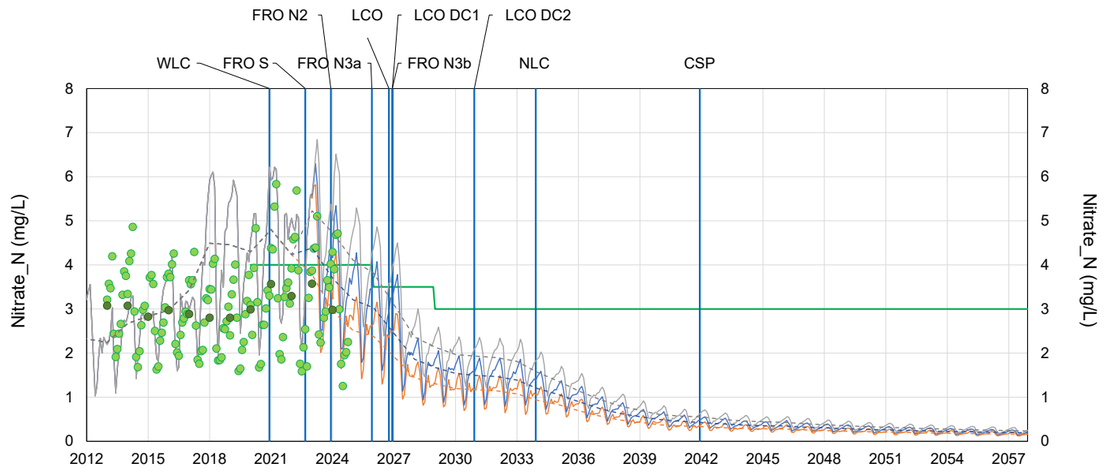


Note: Site Performance Objective is hardness dependent from 2019 onward and is calculated using the following formula: N (in mg-N/L) = $10^{1.0003\log10(\text{hardness})-1.52}$ where hardness is in mg/L of $CaCO_3$.; it varies with time to reflect projected hardness concentrations in the month when maximum monthly nitrate concentrations are projected to occur.

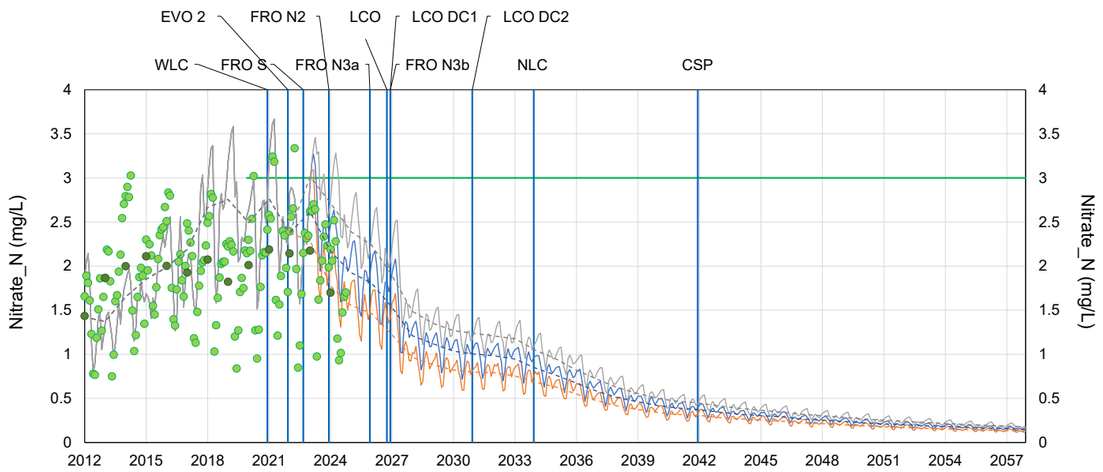
c) Elk River upstream of Boivin Creek (GH_ER1; E206661)



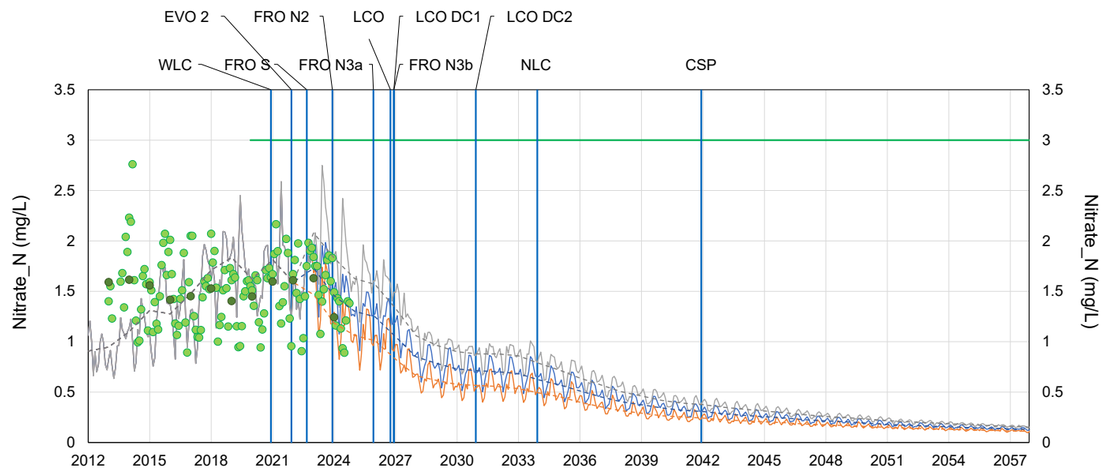
(d) Elk River upstream of Grave Creek (EV_ER4; 0200027)



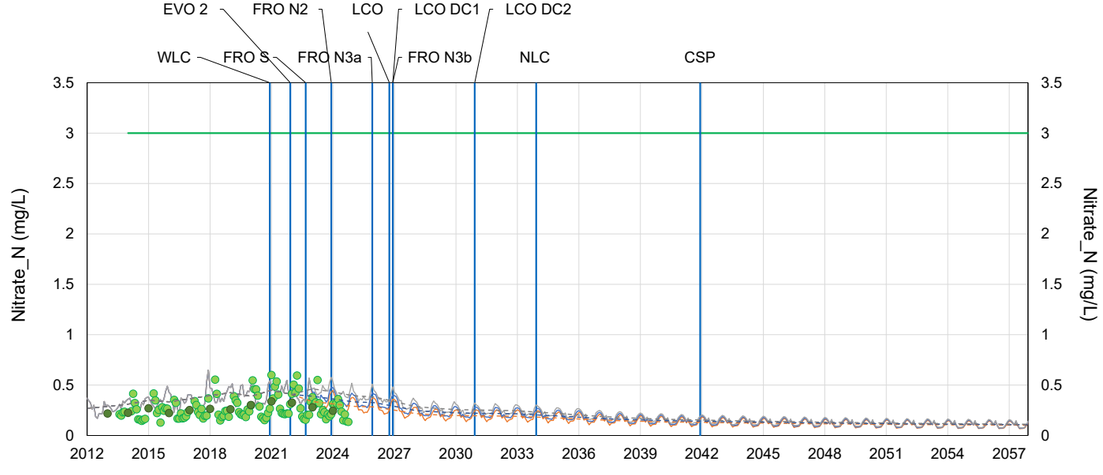
(e) Elk River downstream of Michel Creek (EV_ER1; 0200393)



(f) Elk River at Elko Reservoir (RG_ELKORES; E294312)



(g) Koocanusa Reservoir (RG_DSELK; E300230)



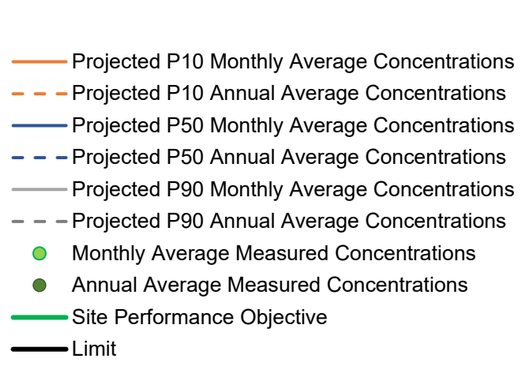
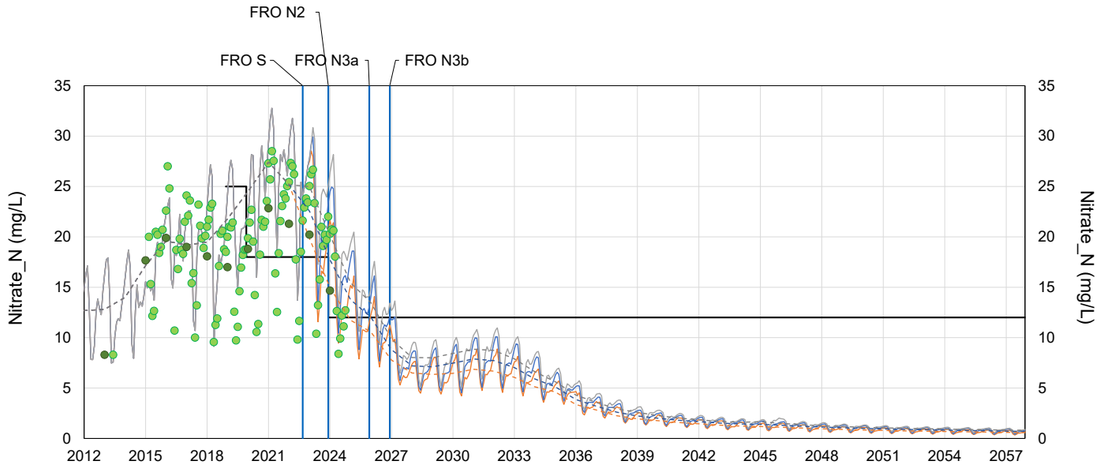
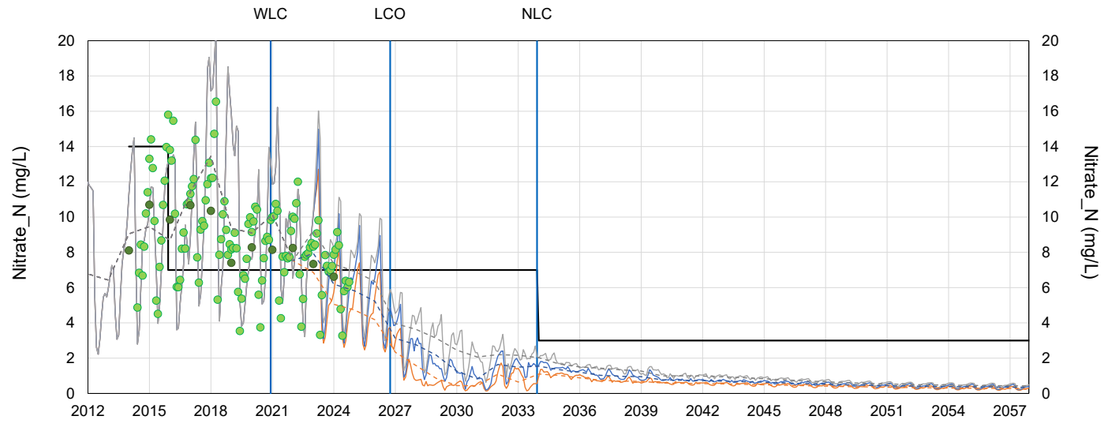


Figure 3.3. Projected Monthly Average Nitrate Concentrations at Compliance Points from 2012 to 2057.

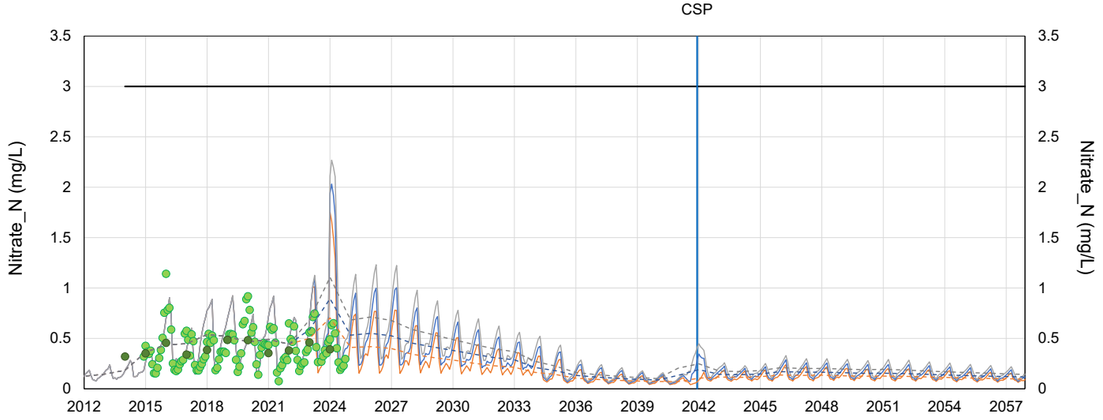
(a) FRO Compliance Point (FR_FRABCH; E223753)



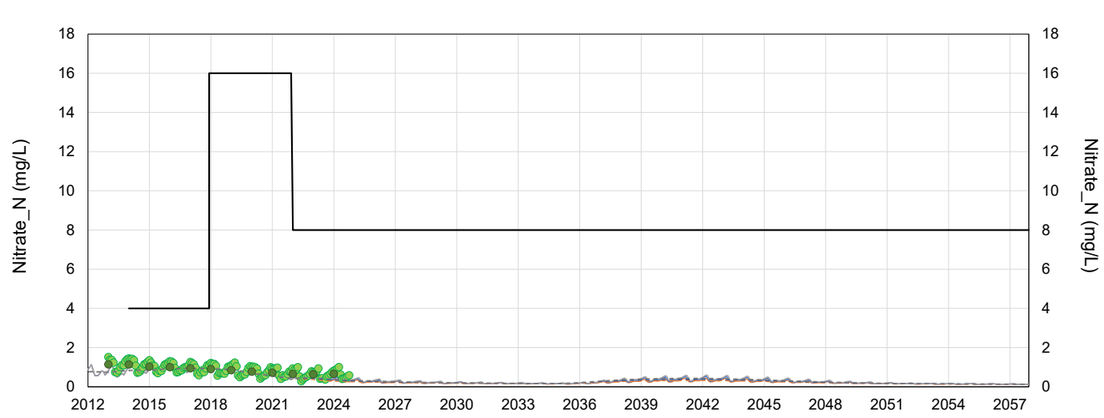
(b) LCO Compliance Point (LC_LCDSSLCC; E297110)



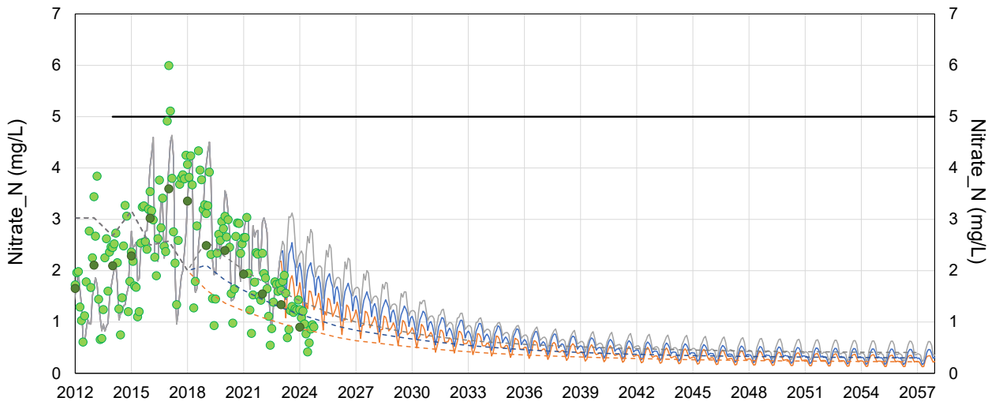
(c) GHO Elk River Compliance Point (GH_ERC; E300090)



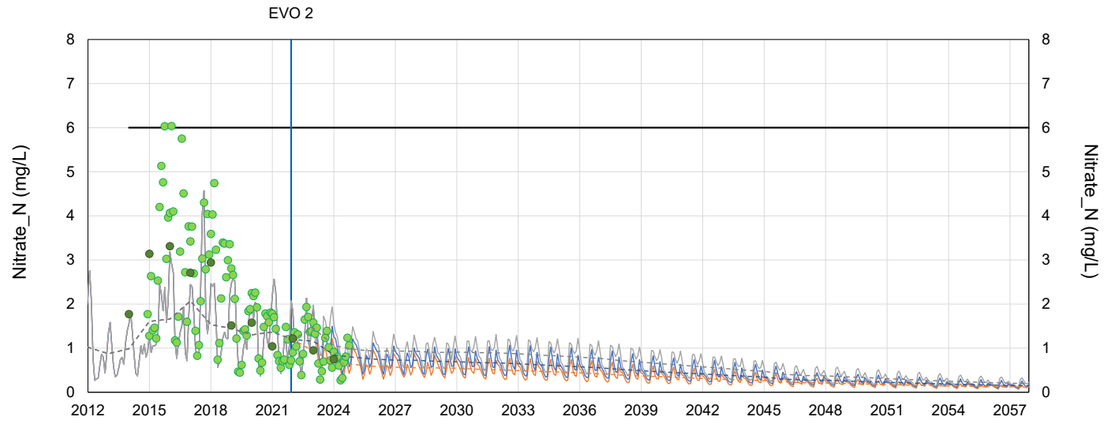
(d) EVO Harmer Compliance Point (EV_HC1; E102682)



(e) CMO Compliance Point (CM_MC2; E258937)



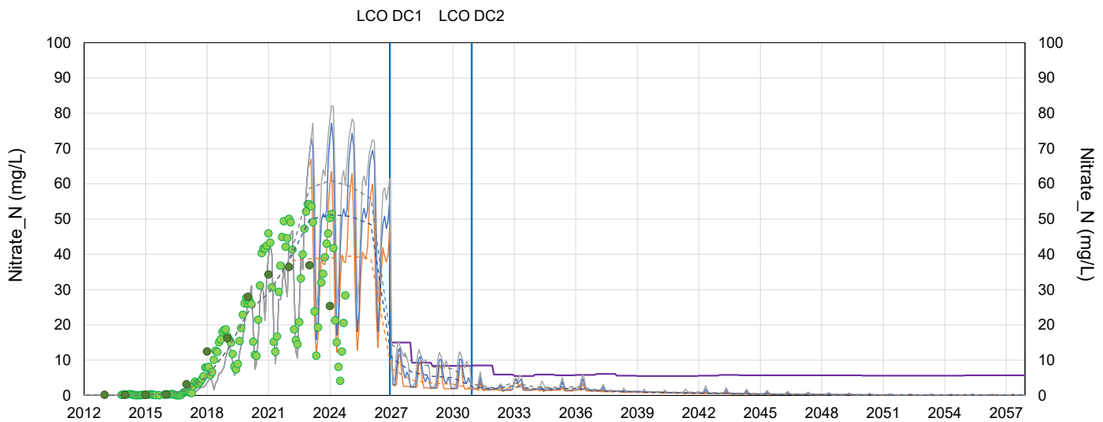
(f) EVO Michel Creek Compliance Point (EV_MC2; E300091)



Projected P10 Monthly Average Concentrations
Projected P10 Annual Average Concentrations
Projected P50 Monthly Average Concentrations
Projected P50 Annual Average Concentrations
Projected P90 Monthly Average Concentrations
Projected P90 Annual Average Concentrations
Monthly Average Measured Concentrations
Annual Average Measured Concentrations
Site Performance Objective
Limit

Figure 3.4. Projected Monthly Average Concentrations of Nitrate in LCO Dry Creek from 2012 to 2057.

(a) LCO Dry Creek downstream of the Sedimentation Ponds (LC_DCDS; E295210)



Note: Existing limit under review.

3.2.2.2 Selenium Projections

Order Stations

Monthly average selenium concentrations are projected to meet short-, medium- and long-term SPOs at the following Order Stations (Figure 3.5):

- Elk River upstream of Boivin Creek (GH_ER1; E206661)
- Elk River downstream of Michel Creek (EV_ER1; 0200393)
- Elk River at Elko Reservoir (RG_ELKORES; E294312)
- Koocanusa Reservoir (RG_DSELK; E300230)

Monthly average selenium concentrations are also projected to meet long-term SPOs at the remaining Order Stations after the commissioning of FRO-N SRF Phase 3b, as follows (Figure 3.5):

- Fording River downstream of Greenhills Creek (GH_FR1; 0.00378) – mid-2026 onward
- Fording River downstream of Line Creek (LC_LC5; 0200028) – mid-2027 onward
- Elk River upstream of Grave Creek (EV_ER4; 0200027) – mid-2027 onward

Prior to commissioning these treatment facilities, monthly average selenium concentrations are projected to be higher than SPOs at the three aforementioned Order Stations. This information is summarized in Table 3.5.

Compliance Points

Monthly average selenium concentrations are projected to meet short-, medium- and long-term Compliance Limits at the following compliance points (Figure 3.6):

- GHO Elk River Compliance Point (GH_ERC; E300090)
- CMO Compliance Point (CM_MC2; E258937)
- EVO Harmer Compliance Point (EV_HC1; E102682)
- EVO Michel Creek Compliance Point (EV_MC2; E300091)

Monthly average selenium concentrations are also projected to meet Compliance Limits at the remaining compliance points, as follows (Figure 3.6):

- FRO Compliance Point (FR_FRABCH; E223753) – mid-2027 onward after the commissioning of FRO-N SRF Phase 3b,
- Fording River downstream of Greenhills Creek (GH_FR1; 0.00378) – mid-2026 onward
- LCO Compliance Point (LC_LCDSSLCC; E297110) – 2026 onward after the commissioning of the LCO AWTF.

Between 2020 and 2027, monthly average selenium concentrations at the three aforementioned locations are projected to be higher than Compliance Limits. This information is summarized in Table 3.5.

Table 3.5. Summary of Projected Monthly Average Selenium Concentrations above Permit 107517 SPOs or Limits between 2025 and 2125.

Type	Location	Year [1]	Month	Maximum Projected Concentration (µg/L)	Corresponding SPO / Limit (µg/L)	Maximum Magnitude of Exceedance (µg/L)
Order Stations	Fording River downstream of Greenhills Creek (GH_FR1; 0200378)	2025	March to April	60	57	3
		2026	February to April	62	57	5
	Fording River downstream of Line Creek (LC_LC5; 0200028)	2025	January to May and December	48	40	8
		2026 to 2027	January to May	49	40	9
	Elk River upstream of Grave Creek (EV_ER4; 0200027)	2025	February to May	23	19	4
		2026 to 2027	January to May	23	19	4
Compliance Points	FRO Compliance Point (FR_FRABCH; E223753)	2025	January to April, September and December	73	58	15
		2026	January to April and December	70	58	12
		2027	January to March	64	58	6
	Fording River downstream of Greenhills Creek (GH_FR1; 0200378)	2025	March to April	60	57	3
		2026	February to April	62	57	5
	LCO Compliance Point (LC_LCDSSLCC; E297110)	2025	April to May	55	50	5
		2026	March to May	61	50	11

Note: µg/L = micrograms per liter.

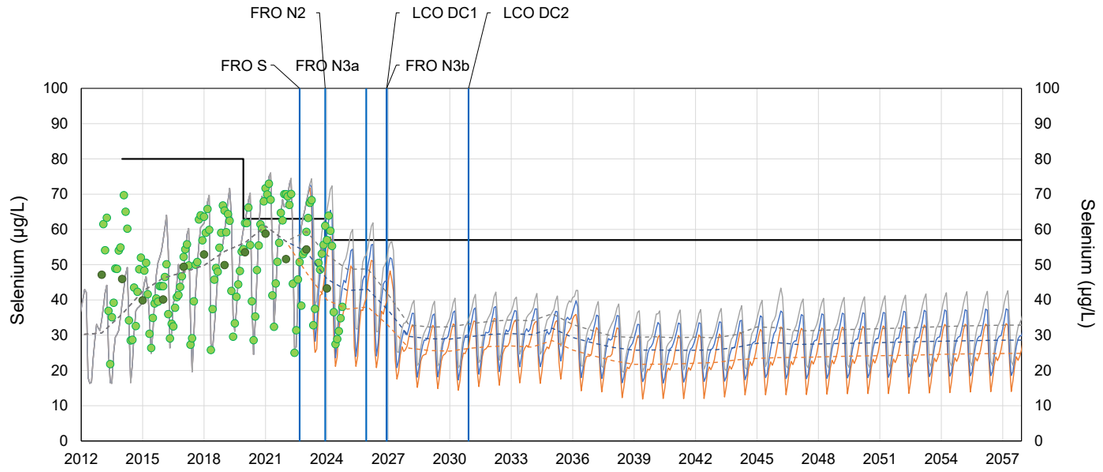
[1] Compliance summary is for 2025 and onward; historical compliance is based on monthly average concentrations for samples collected at the Order stations and compliance points.

LCO Dry Creek

There is currently no selenium limit in Permit 107517 for LCO Dry Creek, it is listed as to be determined. It is expected that this limit will be set following the review of the LCO Dry Creek Water Treatment Project application. As a result, a compliance evaluation has not been completed at this time. However, for reference, predicted monthly average selenium concentrations, along with the current limit are provided in Figure 3.7.

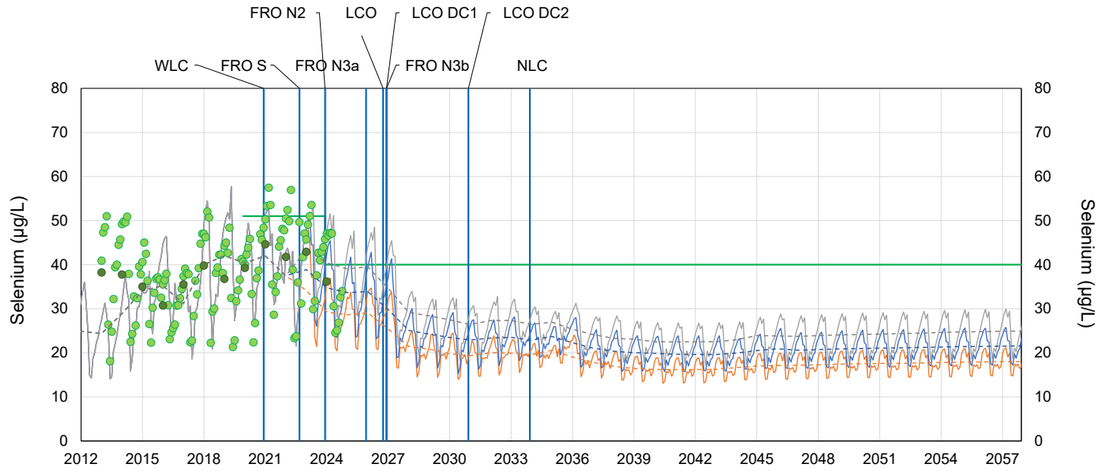
Figure 3.5. Projected Monthly Average Selenium Concentration at Order Stations from 2012 to 2057.

(a) Fording River downstream of Greenhills Creek (GH_FR1; 0200378)

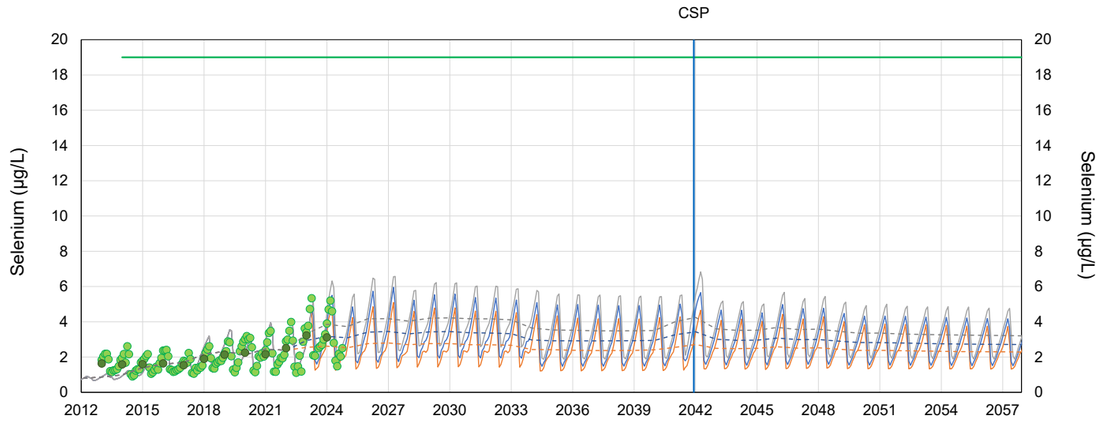


Note: This location is also the GHO Fording River Compliance Point.

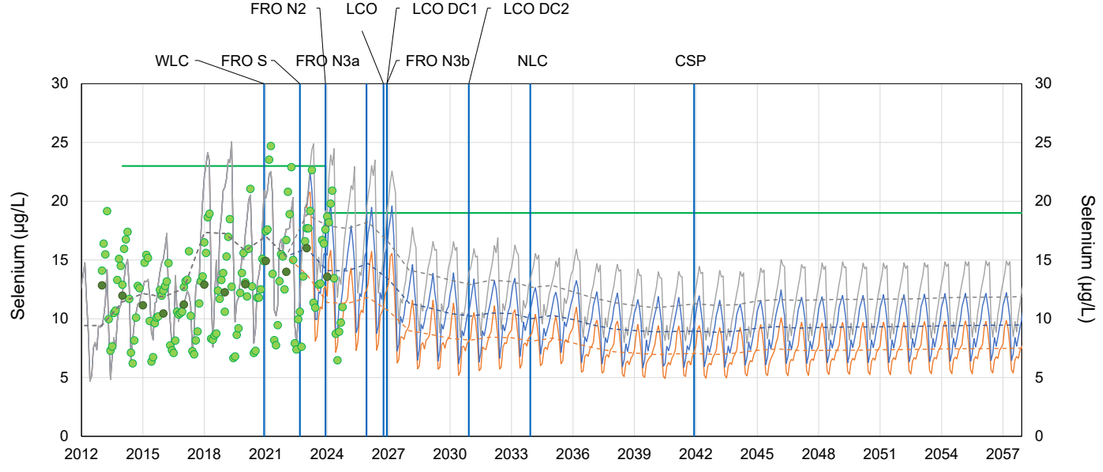
(b) Fording River downstream of Line Creek (LC_LC5; 0200028)



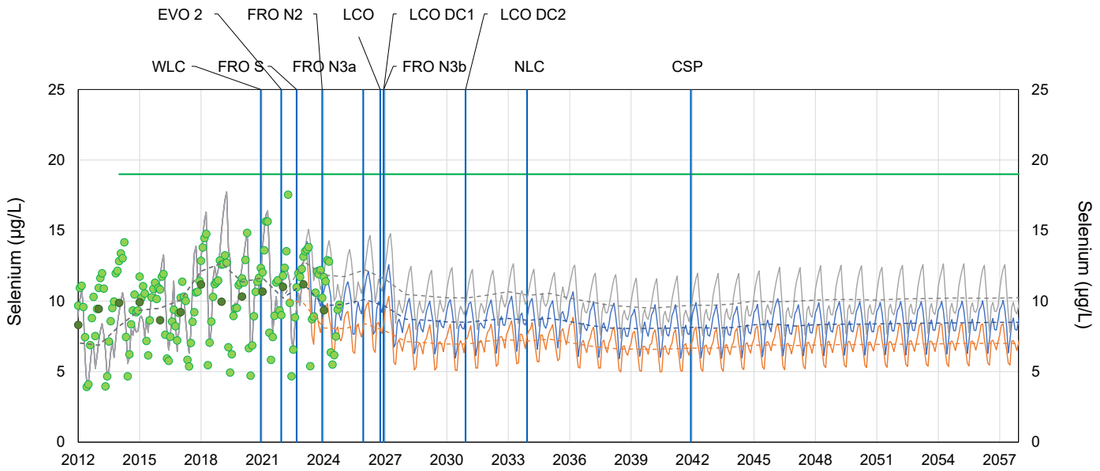
(c) Elk River upstream of Boivin Creek (GH_ER1; E206661)



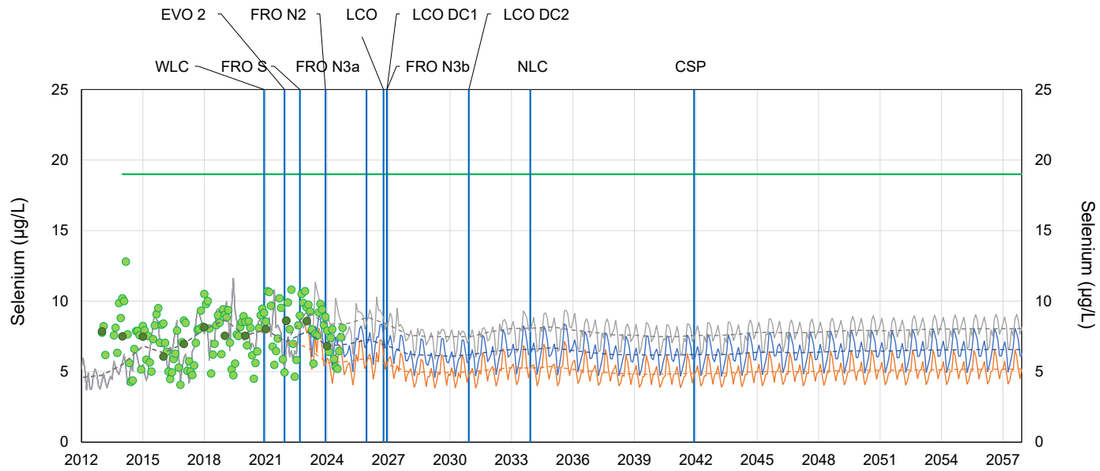
(d) Elk River upstream of Grave Creek (EV_ER4; 0200027)



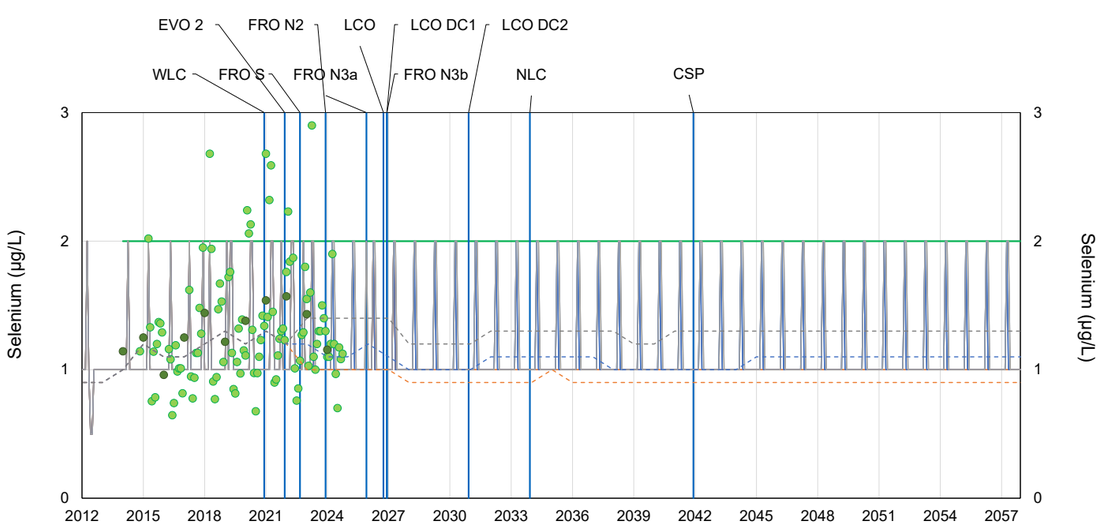
(e) Elk River downstream of Michel Creek (EV_ER1; 0200393)

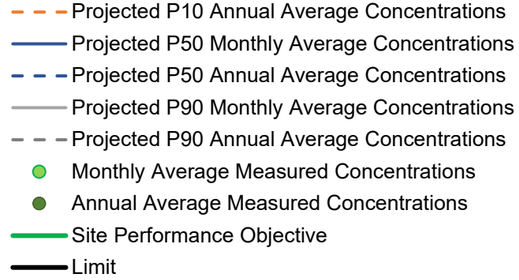


(f) Elk River at Elko Reservoir (RG_ELKORES; E294312)



(g) Koocanusa Reservoir (RG_DSELK; E300230)

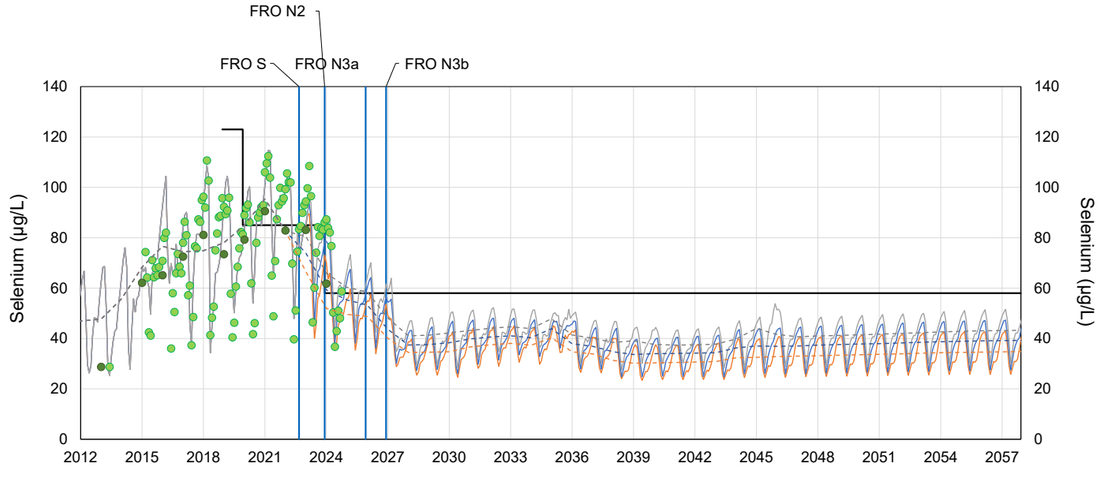




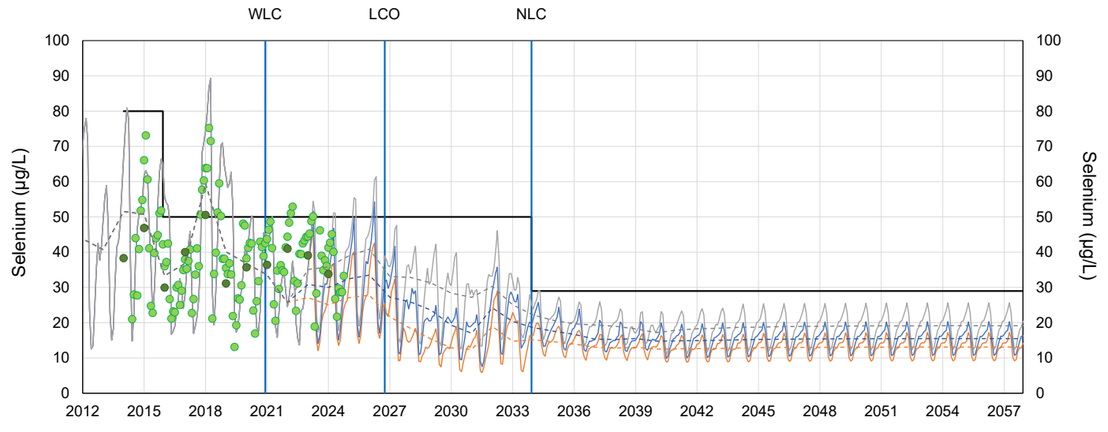
Note: Projected monthly average concentrations are presented with rounding to match the precision of the SPO in effect.

Figure 3.6. Projected Monthly Average Selenium Concentrations at Compliance Points from 2012 to 2057.

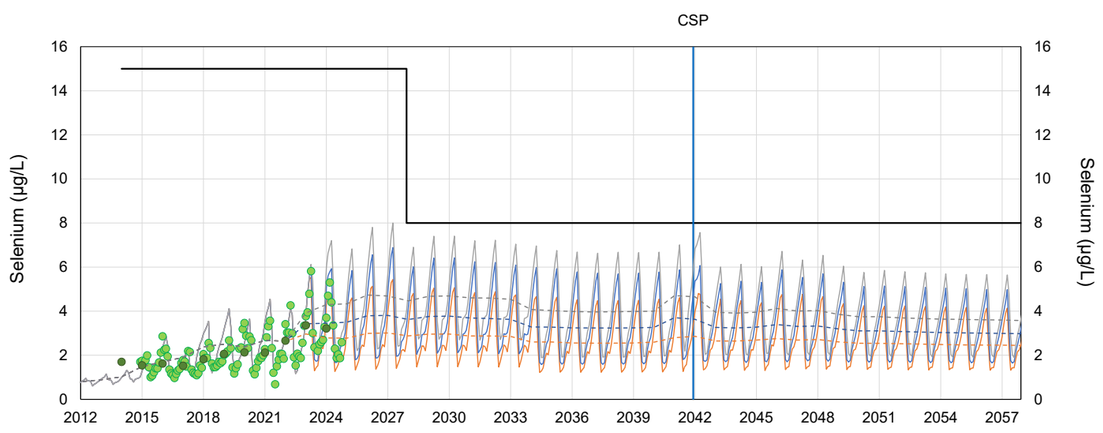
(a) FRO Compliance Point (FR_FRABCH; E223753)



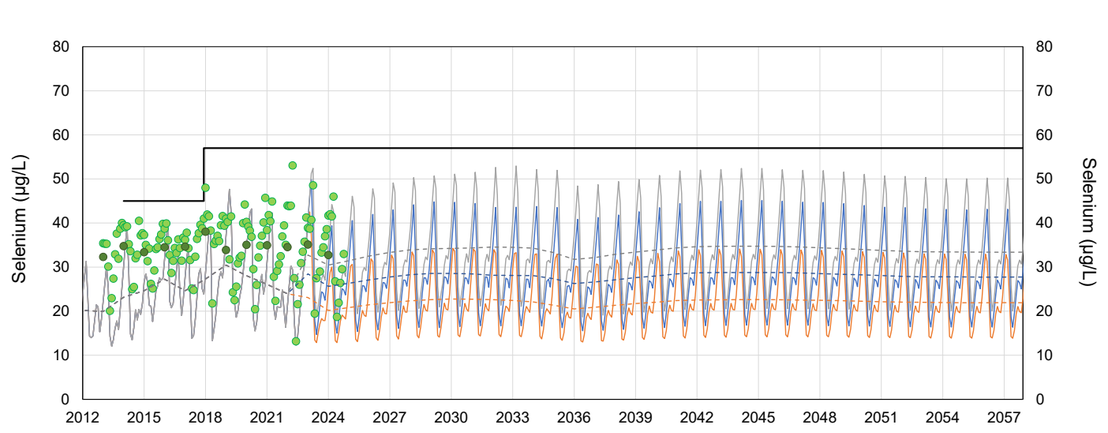
(b) LCO Compliance Point (LC_LCDSSLCC; E297110)



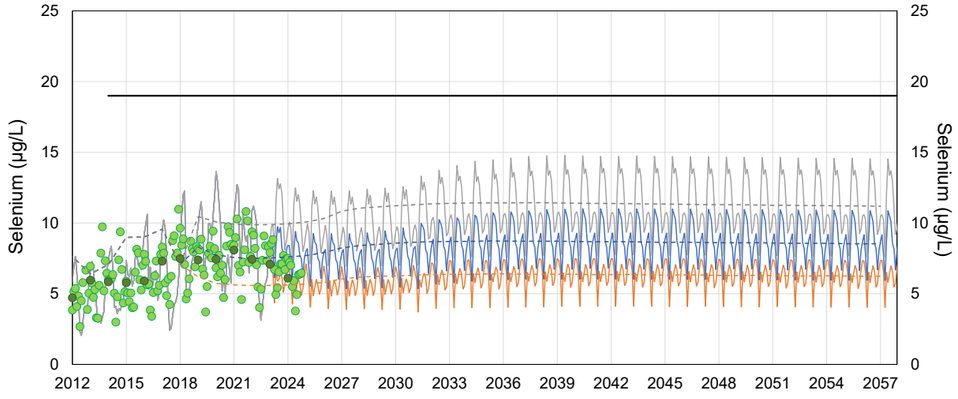
(c) GHO Elk River Compliance Point (GH_ERC; E300090)



(d) EVO Harmer Compliance Point (EV_HC1; E102682)

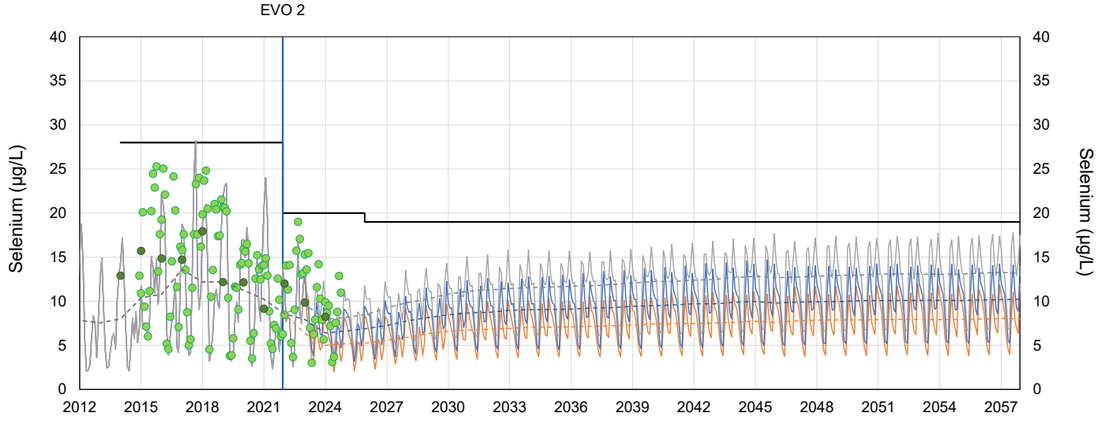


(e) CMO Compliance Point (CM_MC2; E258937)



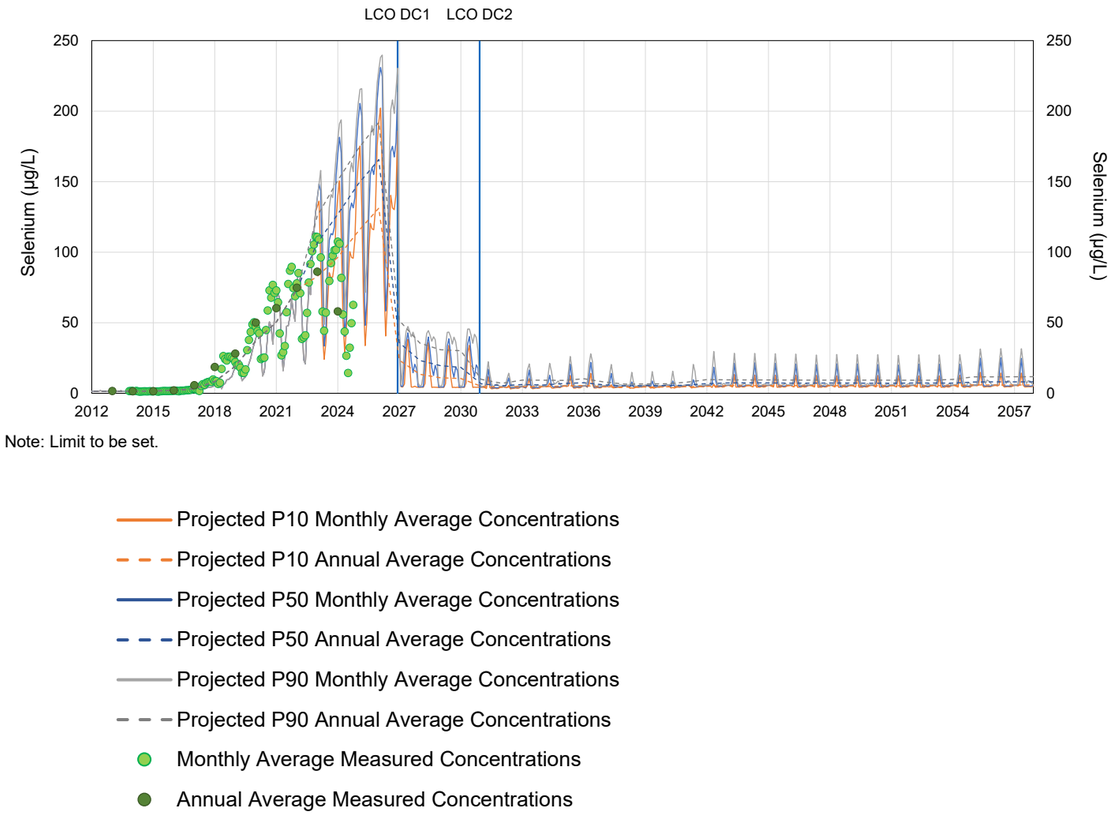
Note: Projected concentrations are from the CMO Water and Load Balance Model.

(f) EVO Michel Creek Compliance Point (EV_MC2; E300091)



- Projected P10 Monthly Average Concentrations
- Projected P10 Annual Average Concentrations
- Projected P50 Monthly Average Concentrations
- Projected P50 Annual Average Concentrations
- Projected P90 Monthly Average Concentrations
- Projected P90 Annual Average Concentrations
- Monthly Average Measured Concentrations
- Annual Average Measured Concentrations
- Site Performance Objective
- Limit

Figure 3.7. Projected Monthly Average Concentrations of Selenium in LCO Dry Creek downstream of the Sedimentation Ponds (LC_DCDS; E295210) from 2012 to 2057.



Note: Limit to be set.

3.2.2.3 Sulphate Projections

Order Stations

Monthly average sulphate concentrations are projected to meet SPOs at the following Order Stations (Figure 3.8):

- Fording River downstream of Line Creek (LC_LC5; 0200028)
- Elk River upstream of Boivin Creek (GH_ER1; 020661)
- Elk River upstream of Grave Creek (EV_ER4; 0200027)
- Elk River downstream of Michel Creek (EV_ER1; 0200393)
- Elk River at Elko Reservoir (RG_ELKORES; E294312)
- Koocanusa Reservoir (RG_DSELK; E300230)

Monthly average sulphate concentrations are also projected to meet the SPO in the Fording River downstream of Greenhills Creek (GH_FR1; 0200378) after the commissioning of the FRO Sulphate Treatment Facility (i.e., from mid 2035 onward; Figure 3.8). Prior to the commissioning of this facility, monthly average sulphate concentrations in the Fording River downstream of Greenhills Creek are projected to be higher than the SPO in February, March, and April from 2032 to 2035. This information is summarized in Table 3.6.

Compliance Points

Monthly average sulphate concentrations are projected to meet compliance limits at the following compliance points (Figure 3.9):

- Fording River downstream of Greenhills Creek (GH_FR1; 0200378)
- LCO Compliance Point (LC_LCDSSLCC; E297110)
- GHO Elk River Compliance Point (GH_ERC; E300090)
- CMO Compliance Point (CM_MC2; E258937)
- EVO Harmer Compliance Point (EV_HC1; E102682)
- EVO Michel Creek Compliance Point (EV_MC2; E300091)

Monthly average sulphate concentrations are also projected to meet the compliance limit at the FRO Compliance Point (FR_FRABCH; E223753) after the commissioning of the FRO Sulphate Treatment Facility (i.e., from mid 2035 onward; Figure 3.9). Prior to the commissioning of this facility, monthly average sulphate concentrations at the FRO Compliance Point are projected to be higher than the compliance limit seasonally. This information is summarized in Table 3.6.

Table 3.6. Summary of Projected Monthly Average Sulphate Concentrations above Permit 107517 SPOs or Limits between 2025 and 2125.

Type	Location	Year [1]	Month	Maximum Projected Concentration (mg/L)	Corresponding SPO / Limit (mg/L)	Maximum Magnitude of Exceedance (mg/L)
Order Station	Fording River downstream of Greenhills Creek (GH_FR1; 0200378)	2032	March, April	451	429	22
		2033	February to April	450	429	21
		2034	February to April	462	429	33
		2035	March to April	452	429	23
Compliance Point	FRO Compliance Point (FR_FRABCH; E223753)	2029, 2031	March	627	605	22
		2032	February to April	672	605	67
		2033	January to April	686	605	81
		2034	February to April	669	605	64
		2035	March	626	605	21

Note: mg/L = milligrams per liter

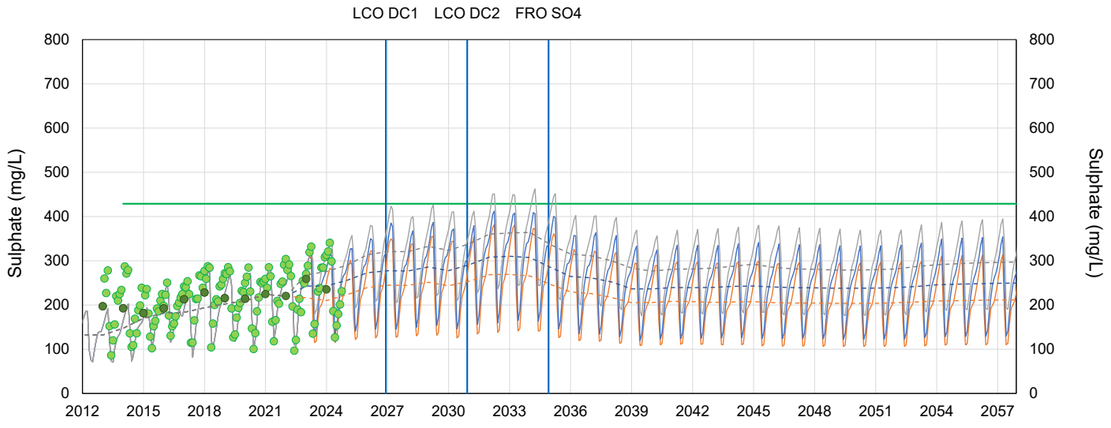
[1] Compliance summary is for 2025 and onward; historical compliance is based on monthly average concentrations for samples collected at the Order stations and compliance points.

LCO Dry Creek

Sulphate concentrations are projected to meet the limit in LCO Dry Creek downstream of the Sedimentation Ponds (LC_DCDS) after the commissioning the LCO Dry Creek AWTF Phases 1 and 2 (i.e., from 2027 onward; Figure 3.10).

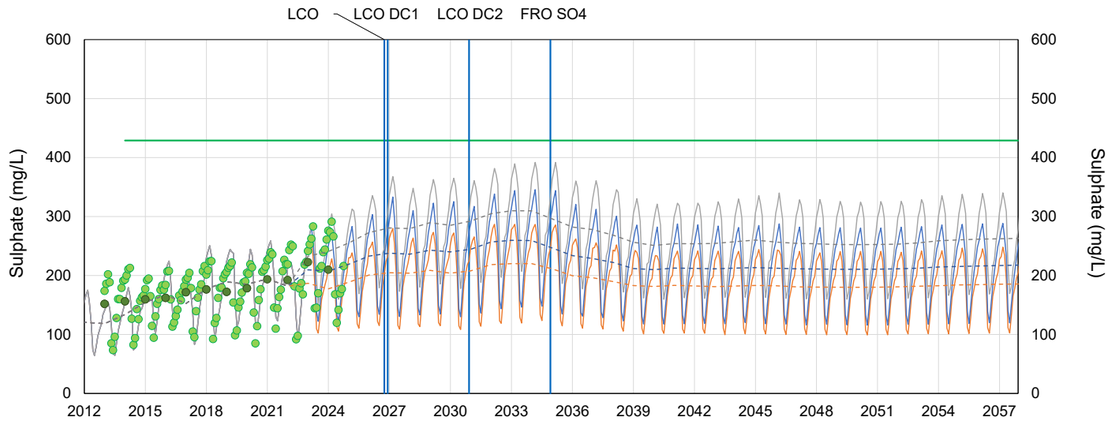
Figure 3.8. Projected Monthly Average Sulphate Concentrations at Order Stations from 2012 to 2057.

(a) Fording River downstream of Greenhills Creek (GH_FR1; 0200378)

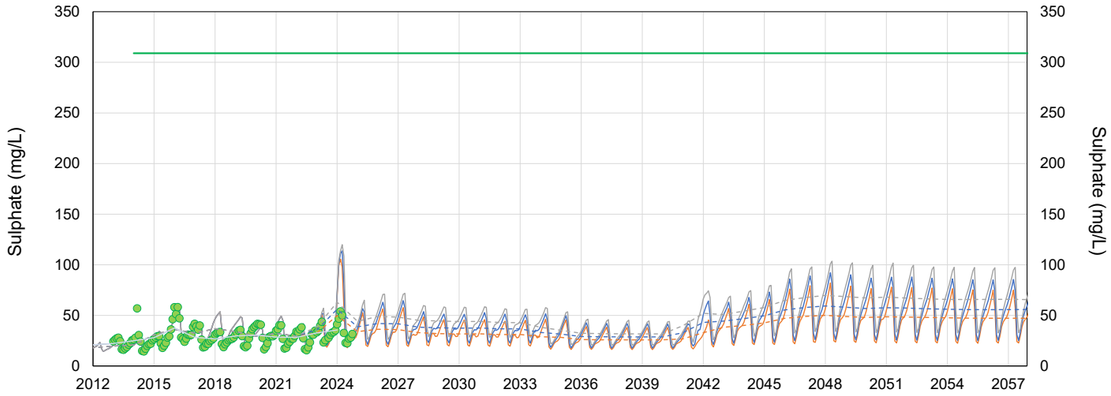


Note: This location is also the GHO Fording River Compliance Point.

(b) Fording River downstream of Line Creek (LC_LC5; 0200028)

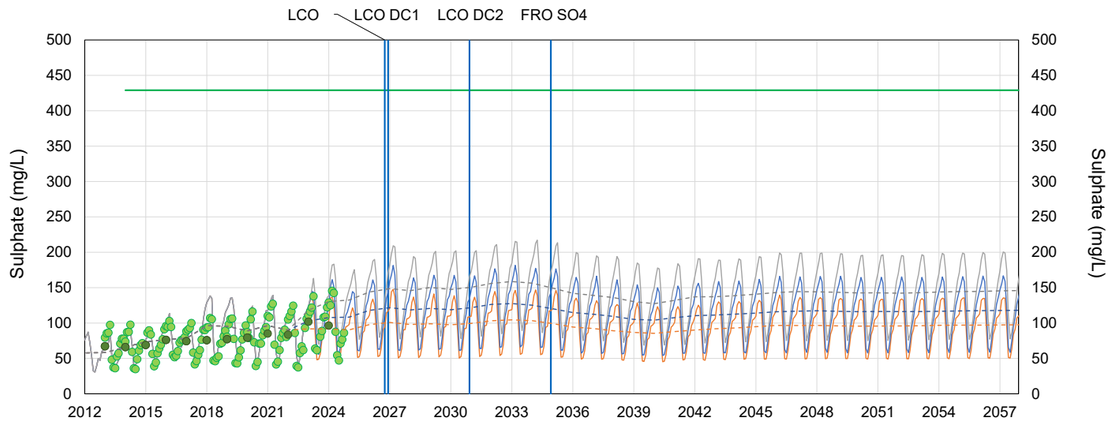


(c) Elk River upstream of Boivin Creek (GH_ER1; E206661)

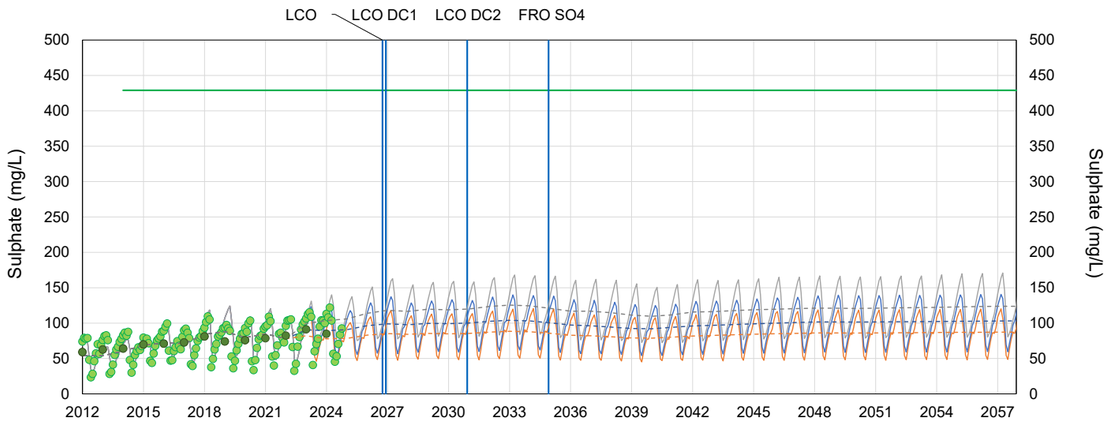


Note: Projected concentrations increase in 2050 because Cougar Pit Phase 6 at GHO is modelled to spill.

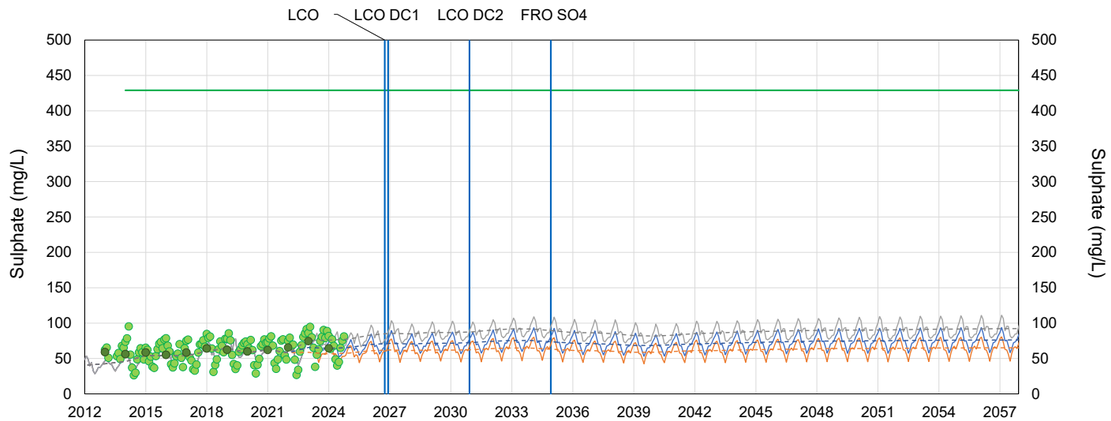
(d) Elk River upstream of Grave Creek (EV_ER4; 0200027)



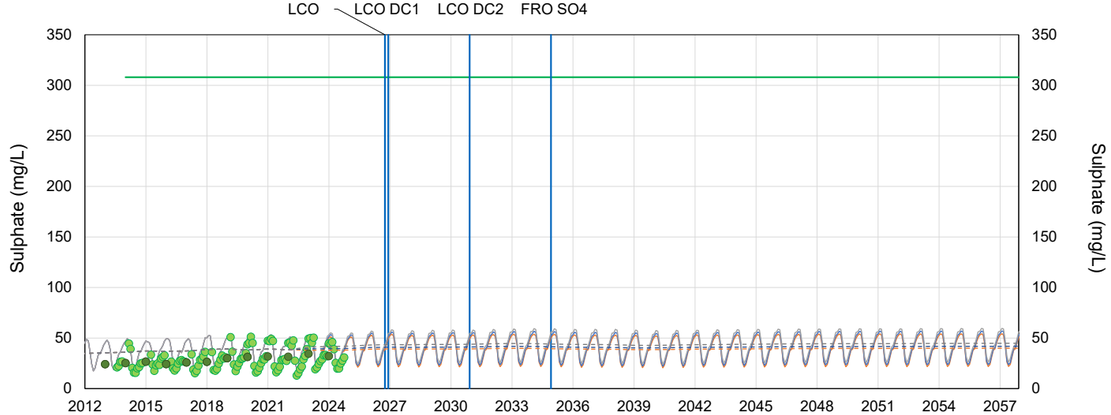
(e) Elk River downstream of Michel Creek (EV_ER1; 0200393)



(f) Elk River at Elko Reservoir (RG_ELKORES; E294312)



(g) Koocanusa Reservoir (RG_DSELK; E300230)



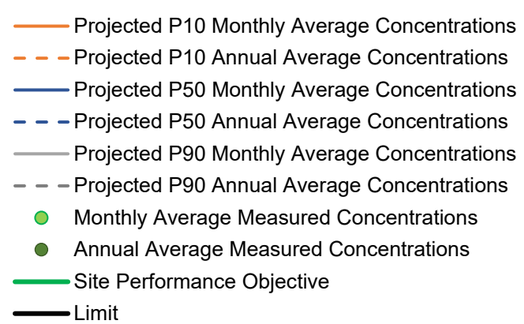
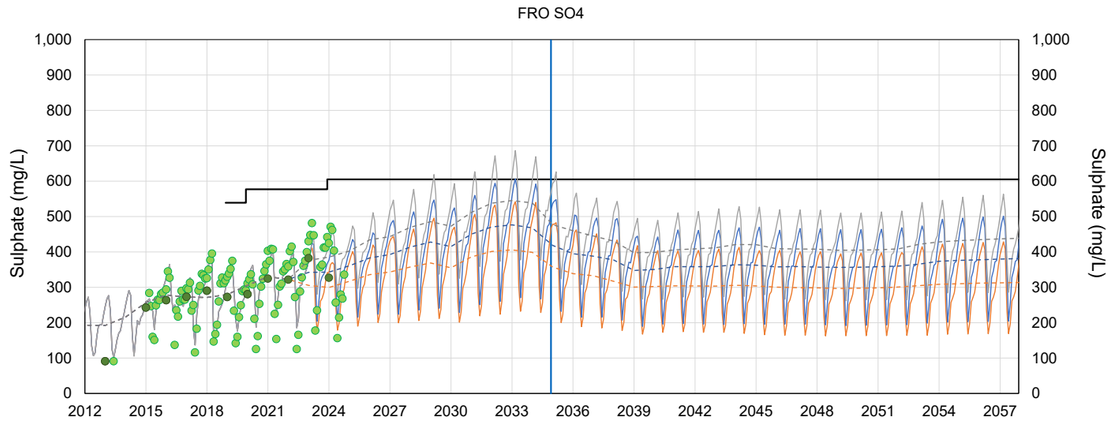
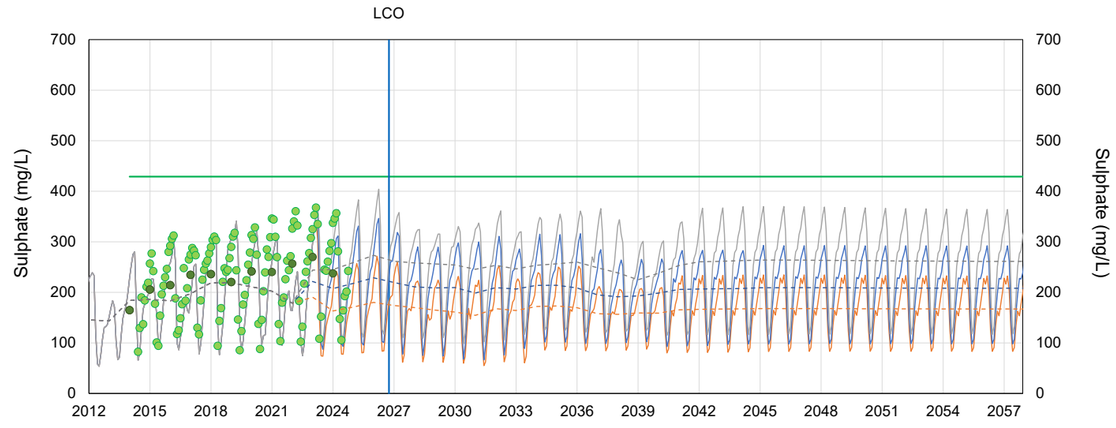


Figure 3.9. Projected Monthly Average Sulphate Concentrations at Compliance Points from 2012 to 2057.

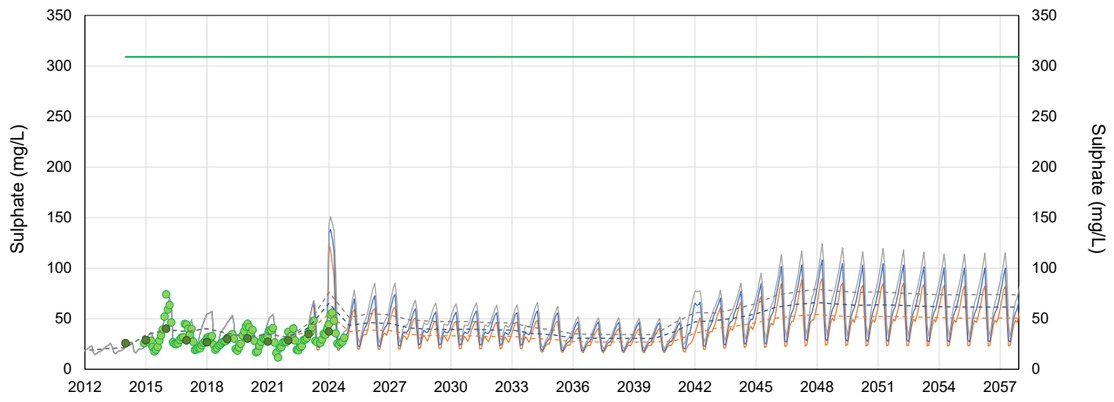
(a) FRO Compliance Point (FR_FRABCH; E223753)



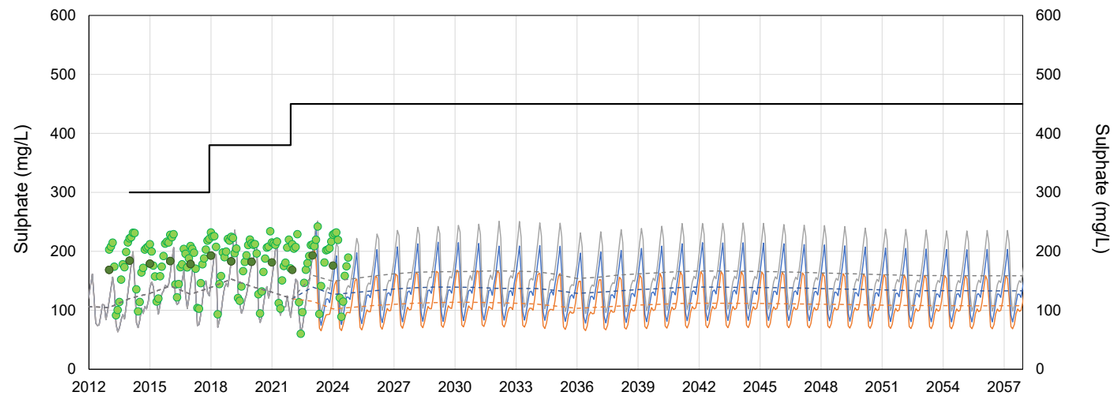
(b) LCO Compliance Point (LC_LCDSSLCC; E297110)



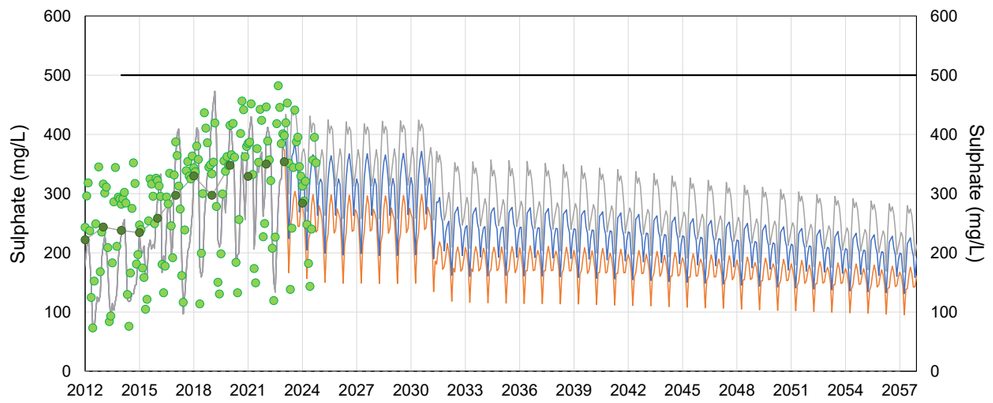
(c) GHO Elk River Compliance Point (GH_ERC; E300090)



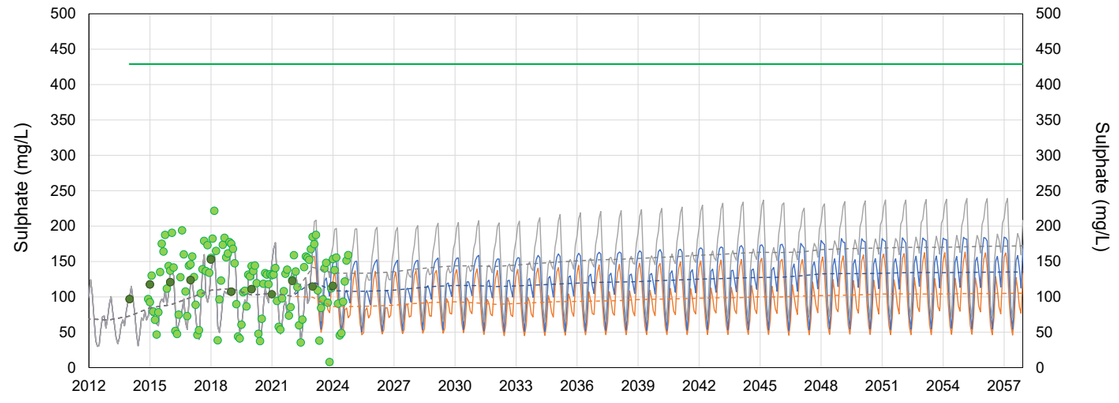
(d) EVO Harmer Compliance Point (EV_HC1; E102682)



(e) CMO Compliance Point (CM_MC2; E258937)

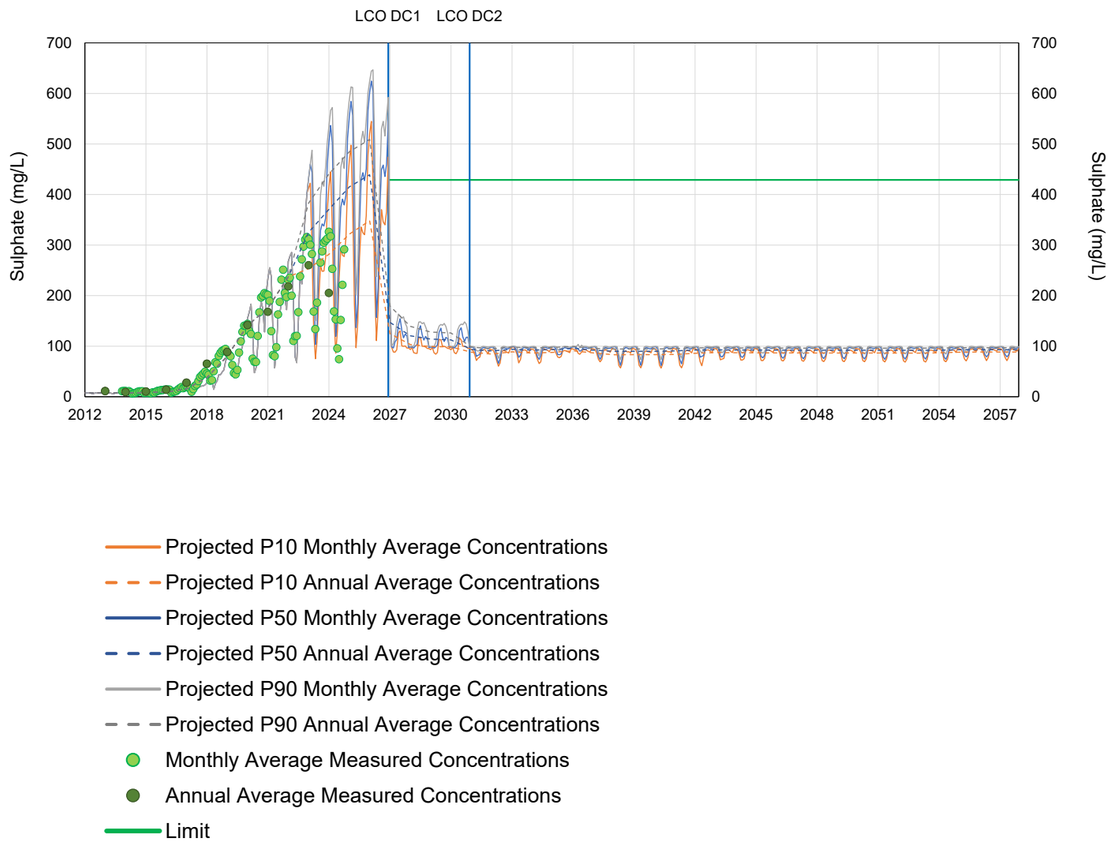


(f) EVO Michel Creek Compliance Point (EV_MC2; E300091)



Projected P10 Monthly Average Concentrations
Projected P10 Annual Average Concentrations
Projected P50 Monthly Average Concentrations
Projected P50 Annual Average Concentrations
Projected P90 Monthly Average Concentrations
Projected P90 Annual Average Concentrations
Monthly Average Measured Concentrations
Annual Average Measured Concentrations
Site Performance Objective
Limit

Figure 3.10. Projected Monthly Average Concentrations of Sulphate in LCO Dry Creek downstream of the Sedimentation Ponds (LC_DCDS; E295210) from 2012 to 2057.



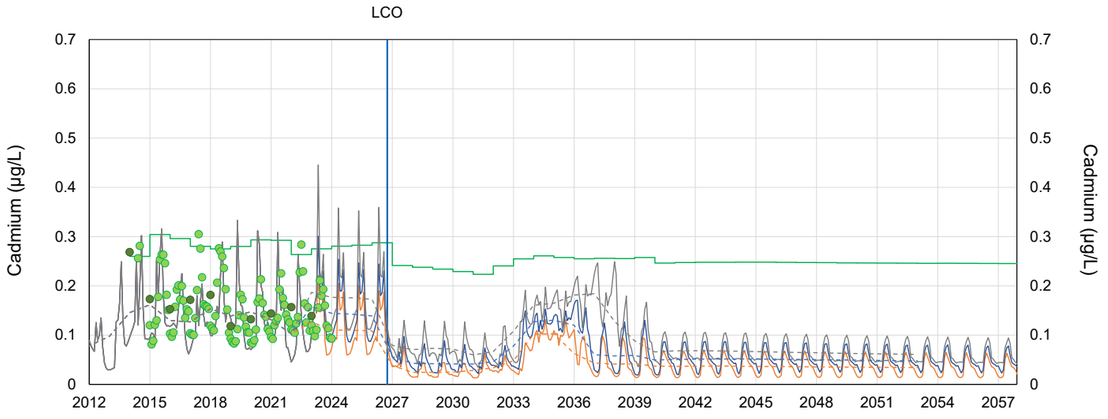
3.2.2.4 Cadmium Projections

Cadmium compliance is currently achieved at all Order stations and compliance points and is projected to be maintained at these locations with the operation of LCO AWTF (Table 3.3). For initial screening purposes, the SPOs were calculated using the minimum P_{50} monthly average projected hardness on an annual basis; refer to Figure 3.11a for the LCO Compliance Point (LC_LCDSSLCC; E297110). The SPOs for cadmium at LC_LCDSSLCC was calculated on a monthly basis using the P_{50} monthly average projected hardness concentrations; no exceedances of the SPO were identified (Figure 3.11b).

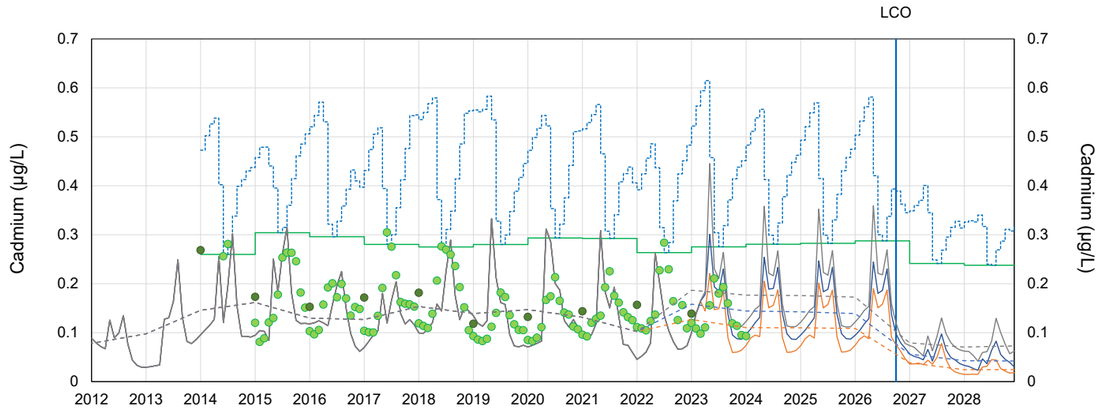
Cadmium concentrations at LCO Dry Creek downstream of Sedimentation Ponds (LC_DCDS; E295210) are projected to decrease from 2027 onward, following the commissioning of the LCO Dry Creek AWTF Phase 1. The current cadmium limit (Permit 107517) in LCO Dry Creek is subject to change following the review of the LCO Dry Creek Water Treatment Project application, therefore a compliance evaluation has not been completed. However, for reference, predicted monthly average cadmium concentrations, along with the current limit are provided in Figure 3.11c.

Figure 3.11. Projected Monthly Average Cadmium Concentrations.

(a) Line Creek Compliance Point (LC_LCDSSLCC; E297110)

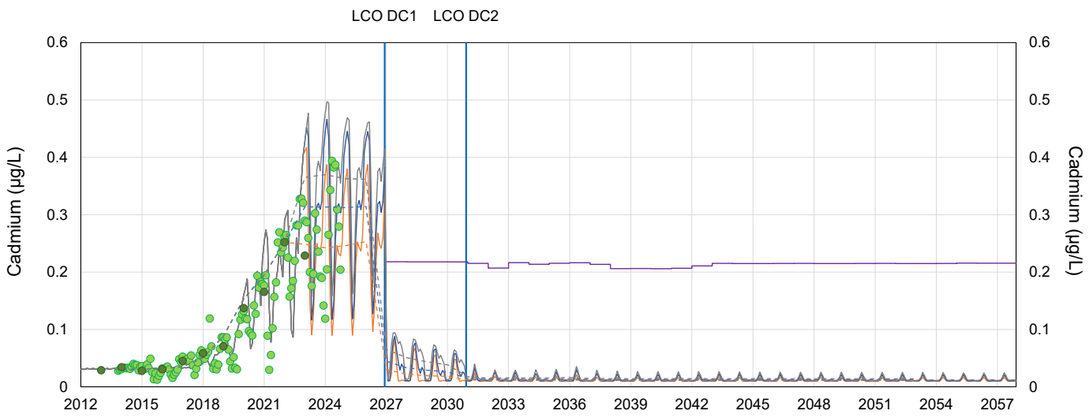


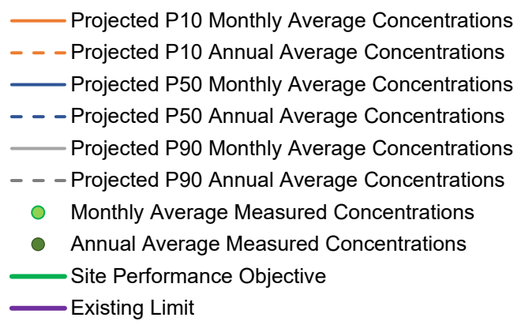
(b) Line Creek Compliance Point (LC_LCDSSLCC; E297110) (2012 to 2028)



Note: Dotted blue line shows SPO calculated using P_{50} monthly average hardness during each month.

(c) LCO Dry Creek downstream of Sedimentation Ponds (LC_DCDS; E295210)





Note: Existing limit under review.

3.3 Sensitivity Analysis

Sensitivity analyses were completed for the 2025 IPA in order to understand the potential risks of uncertainty in model inputs and assumptions on projected concentrations. The purpose of these sensitivity analyses is not to inform future non-compliances, but to provide an opportunity to understand potential changes to projected water quality associated with each uncertainty. The outcomes will be used to inform potential modifications to ongoing investigations and early monitoring programs to ensure that there is sufficient time to adapt future mitigation plans and support compliance.

The following four sensitivity analyses were conducted to identify how changes to model input assumptions impacted projected concentrations under the 2025 IPA:

- changes to assumption on ramp-up of water treatment facilities
- changes to model inputs related to SRF treatment performance
- changes to model inputs related to nitrogen source control (i.e., blasting practices)
- changes to model inputs related to climate (i.e., evaluation of how projections may vary as a result of climate change)

The methods used to complete the sensitivity analyses along with the results are presented in the Elk Valley Water Quality Plan – 2025 Implementation Plan Adjustment – Methods and Projected Concentrations Report (Hatch 2025a). A summary of the results is provided below.

3.3.1 Changes to Model Inputs Related to Ramp-up of Treatment Facilities

In the 2025 IPA, as in previous IPAs, a 1-year commissioning period has been incorporated (EVR, 2025a) and there is no assumed benefits from treatment during this period. Once that date is reached, treatment facilities are considered fully operational and performing as designed and assumed to treat all available flow from the sources targeted for each specific facility up to the effective hydraulic capacity, and/or nitrate load capacity.

EVR has now commissioned and is operating four treatment facilities in the Elk Valley (i.e., FRO AWTF-S, WLC AWTF, FRO-N SRF and EVO SRF). Experience gained during this process indicates that load removal begins well within the one-year commissioning period and that the facilities operate at approximately 70% of the design capacity by the end of this period. However, beyond the first year, several additional years are often required to fully ramp up and consistently achieve performance levels aligned with the original design.

A sensitivity analysis was undertaken to identify how future projections could change if a ramp-up period is considered during the commissioning of new treatment facilities and future expansion phases. To accomplish this, a ramp-up curve equation was developed based on based on literature and historical water treatment performance and this ramp-up rate was assumed for each future treatment facility and expansion phases.

The ramp-up formula is a logarithmic equation that estimates treatment capacity at any given time after the commissioning of the facility; the ramp-up period begins one month after the commission date, which is assumed to occur one year prior the operational date (EVR 2025a). The formula, based on the curve in Figure 3.12, is presented below.

$$y = 16\ln(x) + 33 \qquad \text{(Equation 1)}$$

Where:

- y is the design capacity (%), as determined by either water availability, hydraulic throughput, or nitrate load.
- x is the number of months since commissioning.

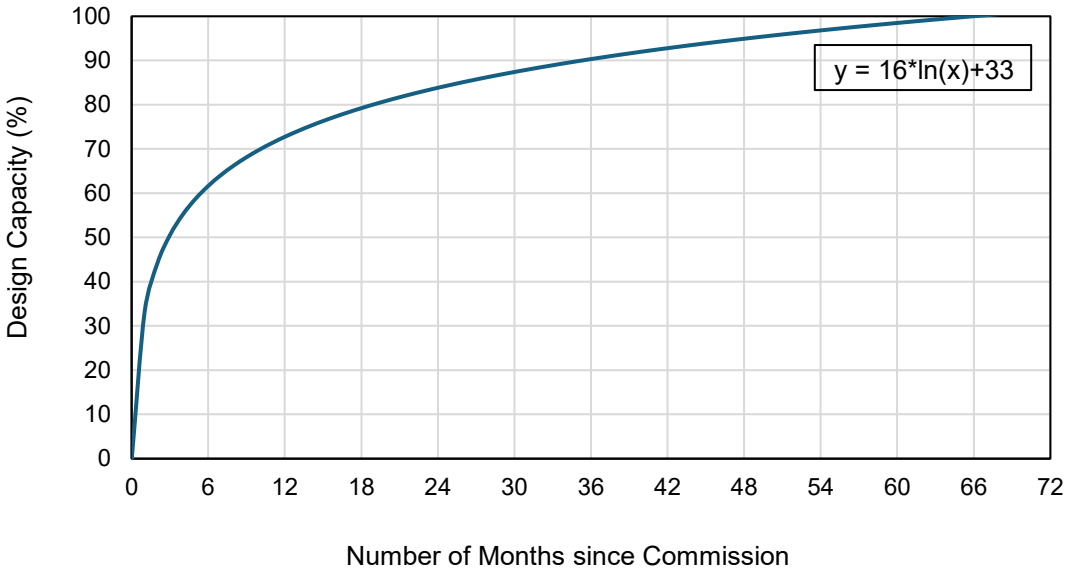


Figure 3.12. Ramp-Up Curve.

Overall, incorporating a ramp-up period for future treatment facilities following commissioning resulted in higher concentrations during the first five to 10 years after commissioning at compliance points and Order stations relative to projections in the 2025 IPA. The level of projected change varied among the compliance points, due to differences in the design capacity and configuration of future upstream facilities. Predicted monthly average concentrations at the FRO Compliance Point (FR_FRABCH; E223753), LCO Compliance Point (LC_LCDSSLCC; E297110), and Fording River downstream of Line Creek (LC_LC5; 0200028) are shown on Figure 3.13, Figure 3.14 and Figure 3.15, respectively. Treatment prior to the operational date was not incorporated into the model setup for this sensitivity case; consequently, the model projections for this sensitivity case represent a more conservative ramp-up scenario. Findings from this sensitivity analysis are provided in detail in the Hatch (2025a) and summarized as follows:

- At the FRO Compliance Point (FR_FRABCH; E223753), maximum P_{90} monthly average concentrations are projected to increase relative to 2025 IPA concentrations by up to 7% for selenium and 6% for nitrate between 2027 and 2031, and by up to 0.1% for sulphate. However, consideration of a ramp-up period at the FRO-N SRF does not result in projected compliance risks (Figure 3.13).
- At the GHO Compliance Point (GH_ERC; E0300090), maximum P_{90} monthly average concentrations are projected to increase relative to 2025 IPA concentrations by up to 4% for selenium and 1% for nitrate between 2042 and 2050, without resulting in a projected risk to compliance.
- At the LCO Compliance Point (LC_LCDSSLCC; E297110), maximum P_{90} monthly average concentrations are projected to increase relative to 2025 IPA concentrations by up to 19% for selenium and 19% for nitrate and 12% for sulphate between 2027 and 2038 and remain relative unchanged afterwards. The increase in projected concentrations is the highest among all compliance points; however, increased projected concentrations do not represent a risk to compliance (Figure 3.14).
- At LCO Dry Creek (LC_DCDS; E295210), maximum P_{90} monthly average concentrations are projected to increase relative to 2025 IPA concentrations by up to 50% for selenium and 25% for nitrate and sulphate; and 37% for cadmium between 2027 and 2034 and remain relative unchanged afterwards.

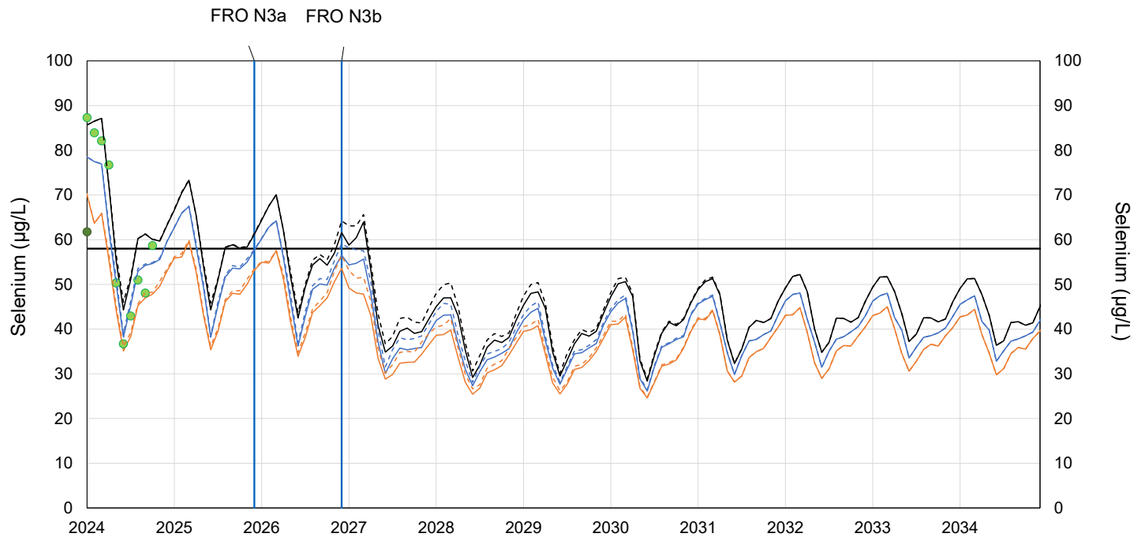
The projected maximum P_{90} monthly average nitrate concentrations remain below the current permit limit (a new proposed limit is currently under review) for LCO Dry Creek Area for most years, apart from two instances in 2031 and 2033. The current limit for nitrate at the LCO Dry Creek Area is currently under review, such that a compliance evaluation at this location is not completed.

- The EVO SRF Phase 3 reaches the effective hydraulic capacity in 2086, approximately five years after the operational date defined in the 2025 IPA (i.e., 2081). P_{90} monthly average selenium concentrations at the EVO Compliance Point (EV_MC2; E300091) are projected to remain relative unchanged from the 2025 IPA.

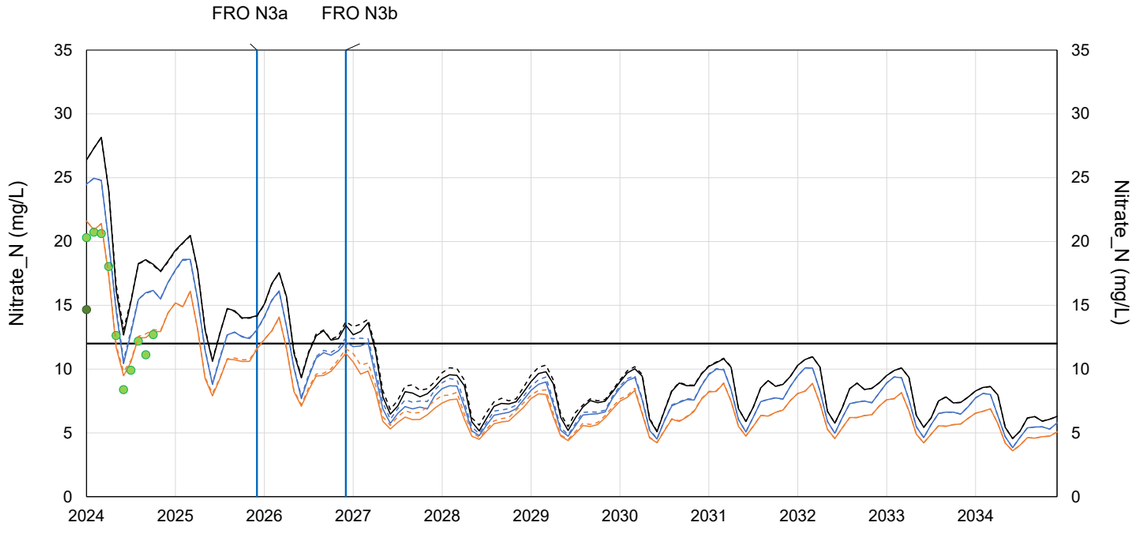
Results from this analysis indicate that the implementation of ramp up after commissioning of treatment facilities appears to have limited influence on projected peak concentrations of selenium, nitrate and sulphate at compliance points, Order stations and at LCO Dry Creek downstream of Sedimentation Ponds (LC_DCDS; E295210). Although P_{90} monthly average concentrations may increase by up to 50% relative to the 2025 IPA, these increases occur at a limited number of locations and during discrete time periods, with no apparent risk of additional non-compliances.

Figure 3.13. Projected Concentrations with and without changes Treatment Ramp-Up Assumptions at FRO Compliance Point (FR_FRABCH; E223753).

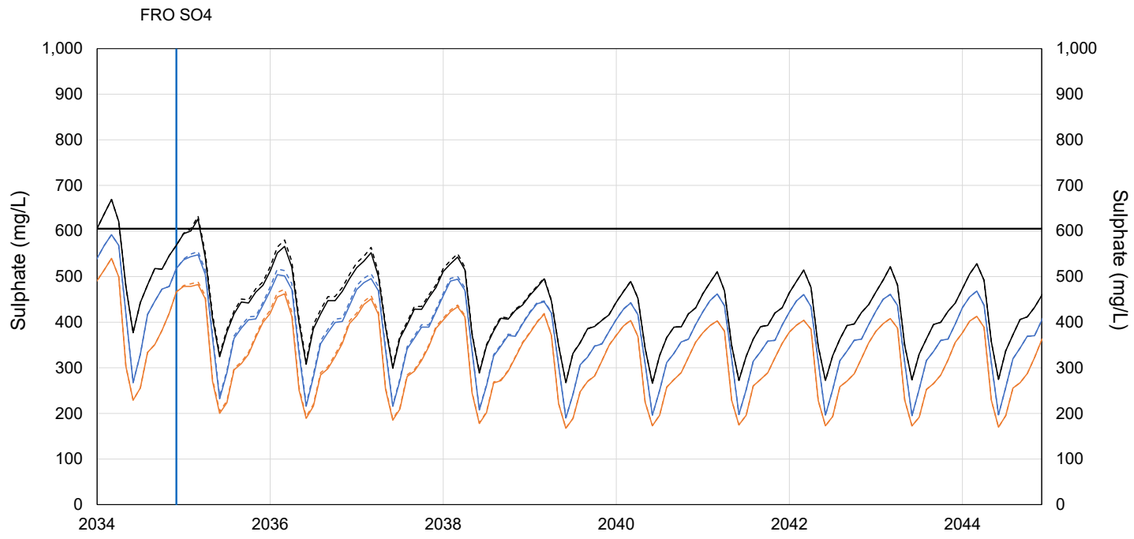
a) Selenium



b) Nitrate



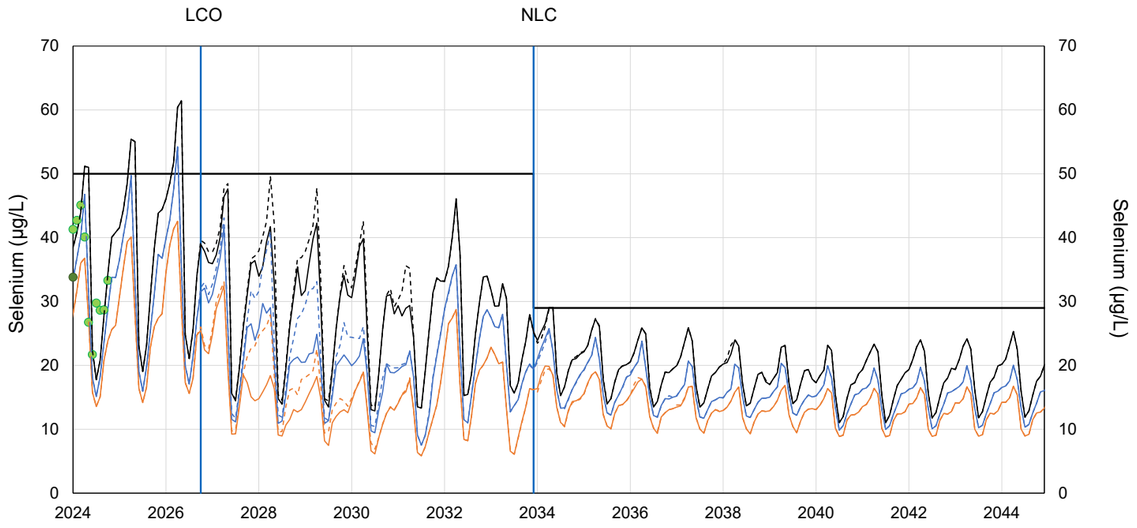
c) Sulphate



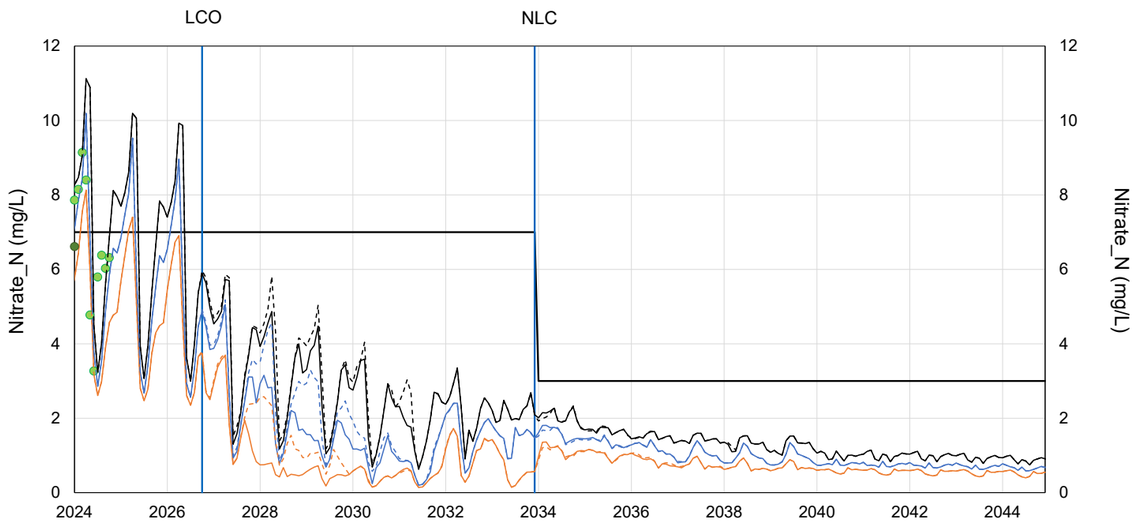
- Projected P10 Monthly Average Concentrations - 2025 IPA
- Projected P50 Monthly Average Concentrations - 2025 IPA
- Projected P90 Monthly Average Concentrations - 2025 IPA
- Projected P10 Monthly Average Concentrations - Sensitivity Analysis
- Projected P50 Monthly Average Concentrations - Sensitivity Analysis
- Projected P90 Monthly Average Concentrations - Sensitivity Analysis
- Monthly Average Measured Concentrations
- Annual Average Measured Concentrations
- Site Performance Objective
- Limit

Figure 3.14. Projected Concentrations with and without changes Treatment Ramp-Up Assumptions at Line Creek Compliance Point (LC_LCDSSLCC; E297110).

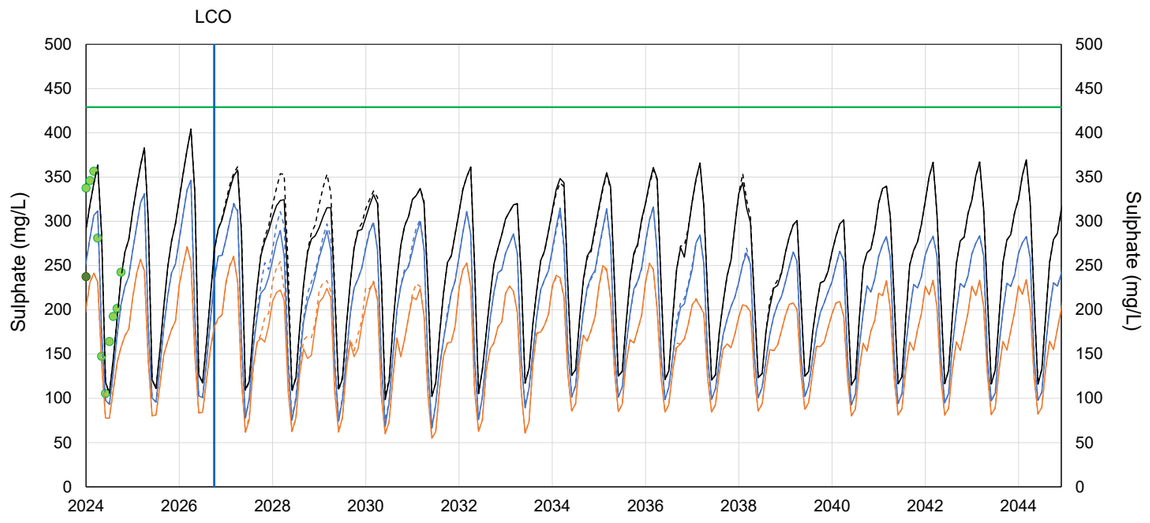
a) Selenium



b) Nitrate



c) Sulphate



d) Cadmium

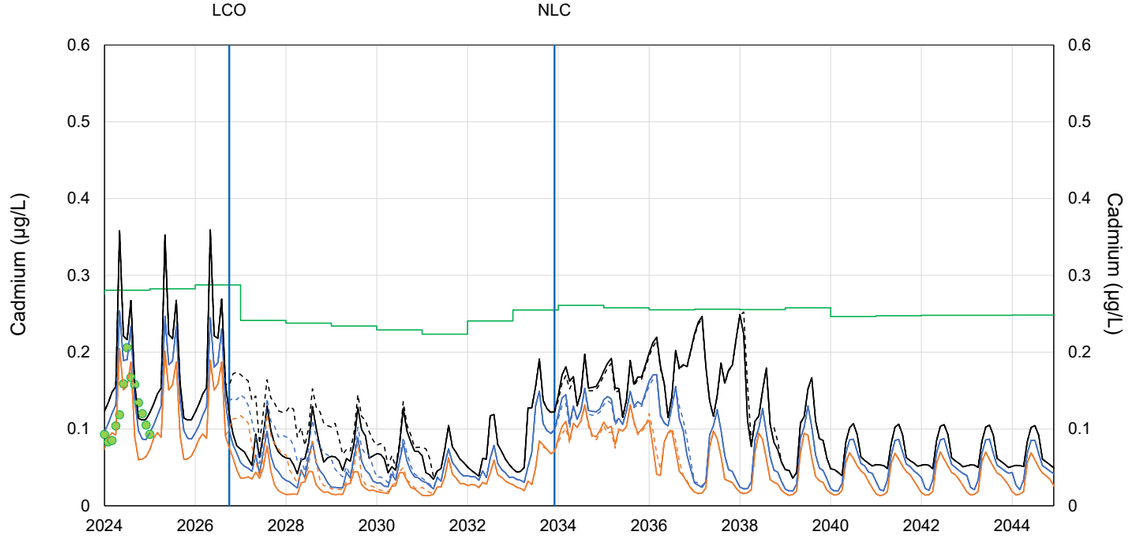
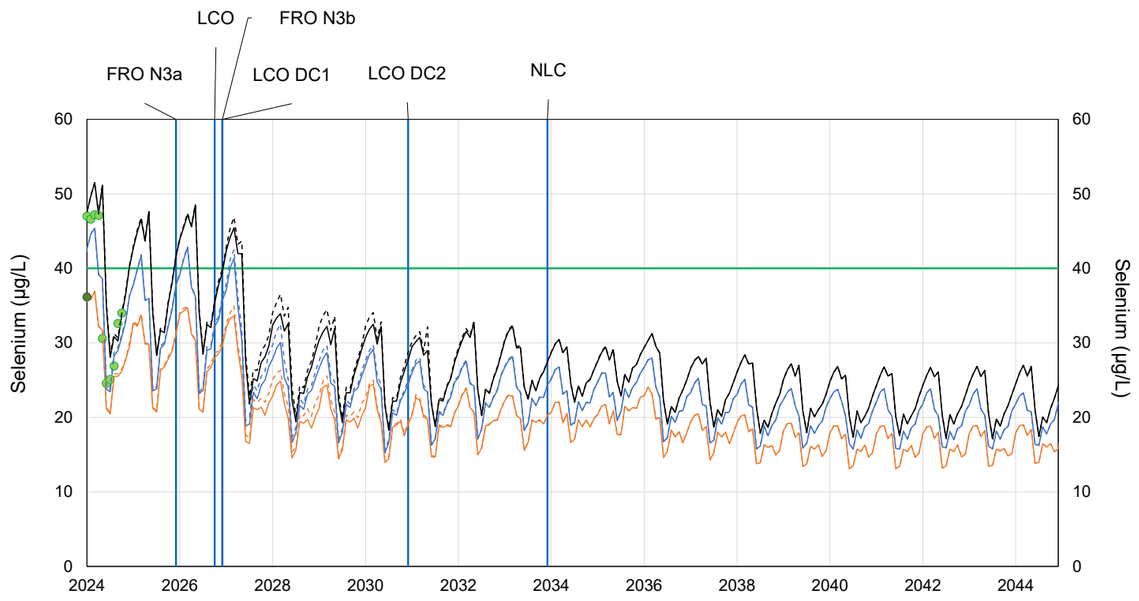
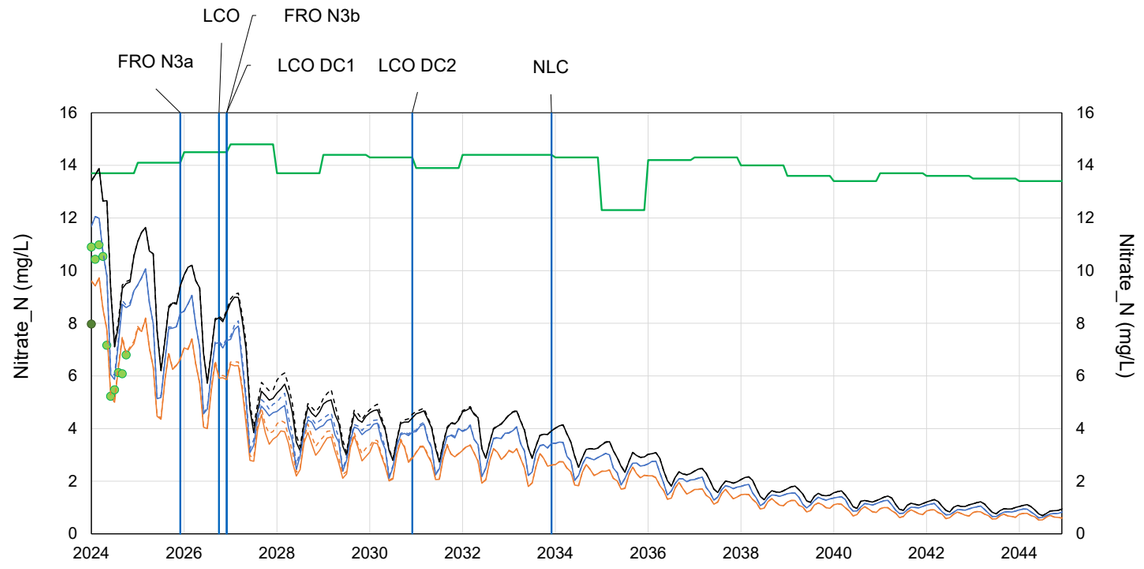


Figure 3.15. Projected Concentrations with and without changes Treatment Ramp-Up Assumptions at Fording River downstream of Line Creek (LC_LC5; 0200028).

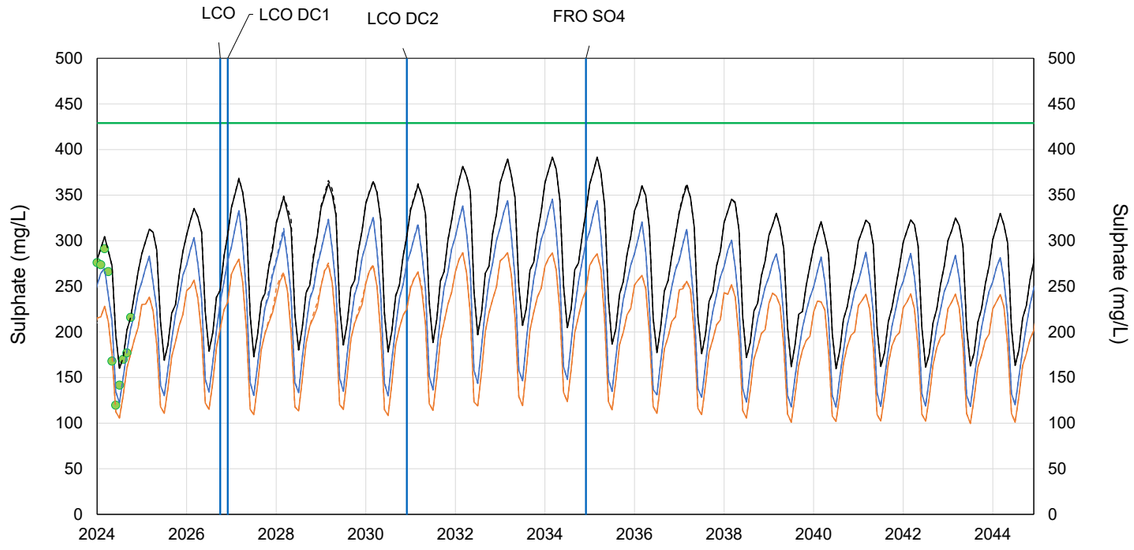
a) Selenium



b) Nitrate



c) Sulphate



- Projected P10 Monthly Average Concentrations - 2025 IPA
- Projected P50 Monthly Average Concentrations - 2025 IPA
- Projected P90 Monthly Average Concentrations - 2025 IPA
- Projected P10 Monthly Average Concentrations - Sensitivity Analysis
- Projected P50 Monthly Average Concentrations - Sensitivity Analysis
- Projected P90 Monthly Average Concentrations - Sensitivity Analysis
- Monthly Average Measured Concentrations
- Annual Average Measured Concentrations
- Site Performance Objective
- Limit

3.3.2 Changes to Model Inputs Related to Saturated Rock Fills Treatment Performance

The numerical representation of the various processes that occur within SRFs has evolved over time and is informed through data obtained from the continued operation of existing facilities. Effluent from operating SRFs is a function of the chemistry of influent water, reactions that occur within the biomass, water-rock interactions as injected water flows across the SRF and mixing of in-situ water and recharge (also referred to as entrainment).

A sensitivity analysis was conducted to evaluate how changes in selenium and nitrate treatment effectiveness and entrainment assumptions in SRFs influence projected selenium and nitrate concentrations at Order stations and compliance points downstream of these facilities.

This sensitivity analysis includes the following reductions to treatment effectiveness in SRFs:

- Reduced selenium and nitrate load removal efficiency from 95% of 90%. This reduction in selenium and nitrate load removal efficiency was applied from 2024 onwards to the current and future SRFs (i.e., FRO-N SRF; North Line Creek (NLC) SRF, Cougar South Pit SRF, and EVO SRF).
- Increased shallow water and deep water mixing term (i.e., used for entrainment estimation) representing the upper 95% confidence bound estimate of entrainment (SRK 2025).

As expected, reducing selenium and nitrate removal and increasing entrainment assumptions result in higher projected selenium and nitrate concentrations at compliance points and Order stations from 2024 onward, relative to the 2025 IPA.

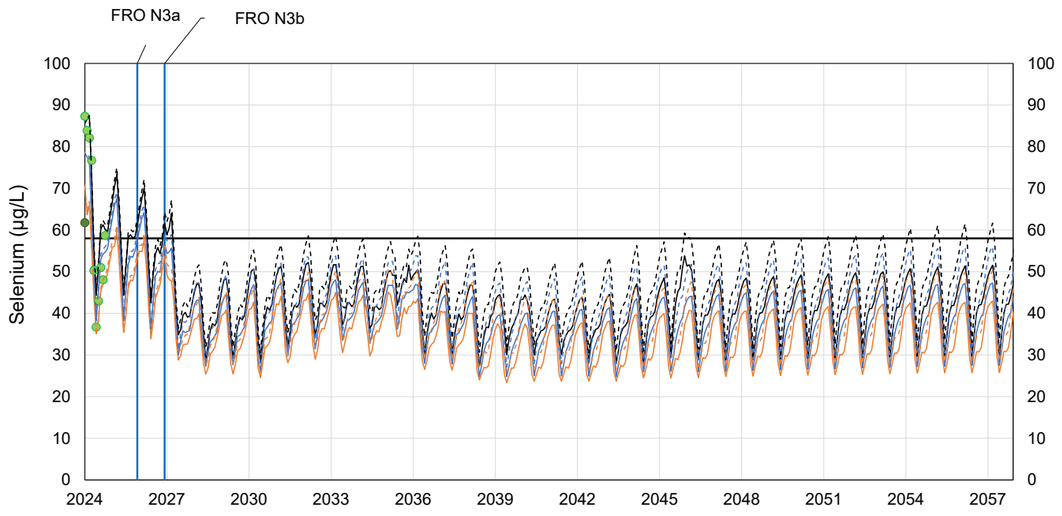
The highest differences in maximum P_{90} monthly average selenium concentrations (i.e., peak concentrations) are projected to occur at the FRO Compliance Point (FR_FRABCH; E300071), with peak concentrations increased by up to 20%, and at the Fording River downstream of Greenhills Creek (GH_FR1; 0200378), with peak concentrations increased by up to 16%. To illustrate, predicted selenium concentrations at these locations and at the downstream Order station, Fording River downstream of Line Creek (LC_LC5; 0200028) are shown on Figure 3.16. The lowest differences were projected at the GHO Elk River Compliance Point (GH_ERC; E300090), the Elk River upstream of Boivin Creek (GH_ER1; E206661), the Elk River at Elko Reservoir (RG_ELKORES; E294312), and the Koocanusa Reservoir south of the Elk River (RG_DSELK; E300230), where peak concentrations increased by up to 5%.

Similar to selenium, the largest differences in monthly average nitrate concentrations are projected at the FRO Compliance Point (FR_FRABCH; E300071), with peak concentrations increasing by up to 0.9 mg-N/L (or 15%) (Figure 3.17a), and at the Fording River downstream of Greenhills Creek (GH_FR1; 0200378), with peak concentrations rising by up to 013% (Figure 3.17b). While increases in concentration are projected at other locations, the magnitude of peak concentrations and percent change relative to the 2025 IPA are lower at other compliance points and downstream Order stations, as shown in Figure 3.17c for the Fording River downstream of Line Creek (LC_LC5; 0200028).

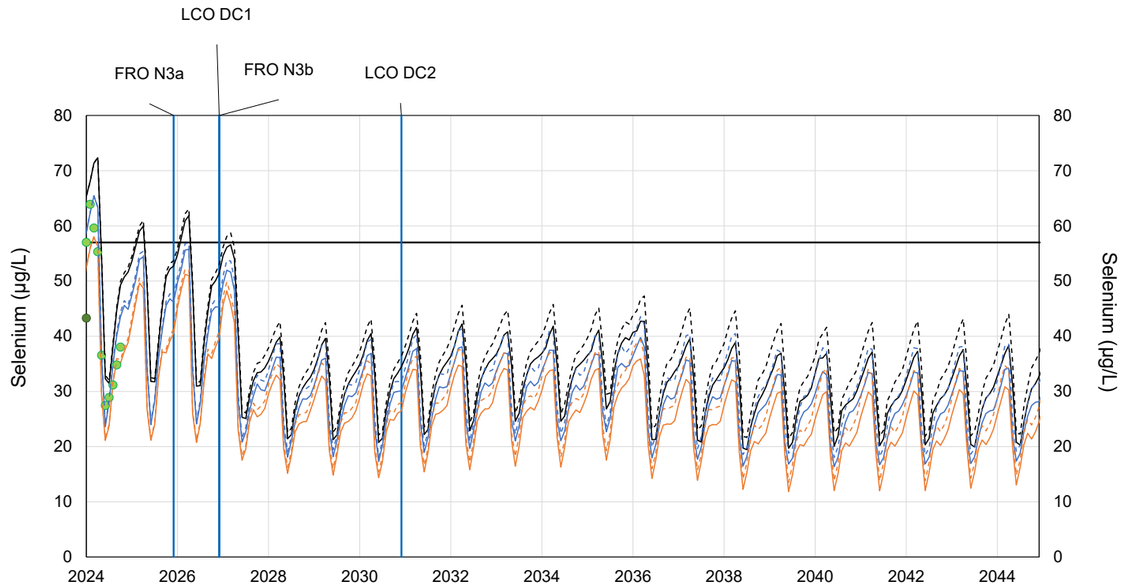
Reducing the treatment effectiveness of SRFs appears to have limited influence (i.e., less than 20%) on projected peak concentrations of selenium and nitrate at Order stations and compliance points. Nonetheless, the sensitivity case resulted in additional projected non-compliances for selenium at the FRO Compliance Point (FR_FRABCH; E300071) during low flow periods from 2032 onwards (Figure 3.16a) and two additional projected non-compliances at Fording River downstream of Greenhills Creek (GH_FR1; 0200378) from February to March 2027 (Figure 3.16b). This sensitivity case does not suggest a higher potential risk of non-compliances for nitrate.

Figure 3.16. Projected Concentrations of Selenium with and without changes to Saturated Rock Fill Treatment Performance

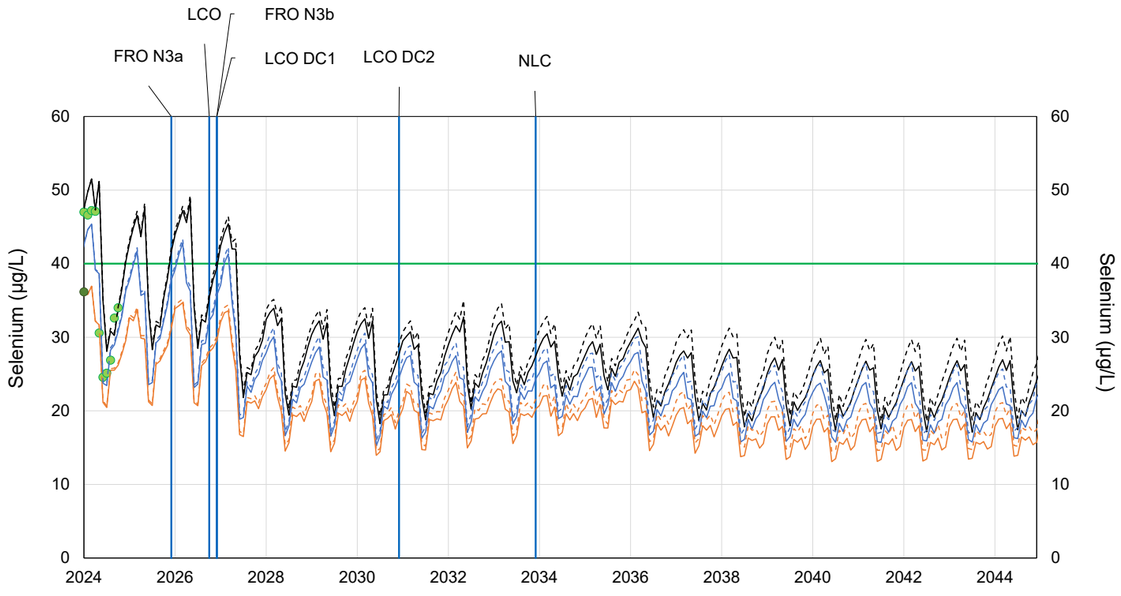
a) FRO Compliance Point (FR_FRABCH; E223753)



b) Fording River downstream of Greenhills Creek (GH_FR1; 0200378)



c) Fording River downstream of Line Creek (LC_LC5; 0200028)



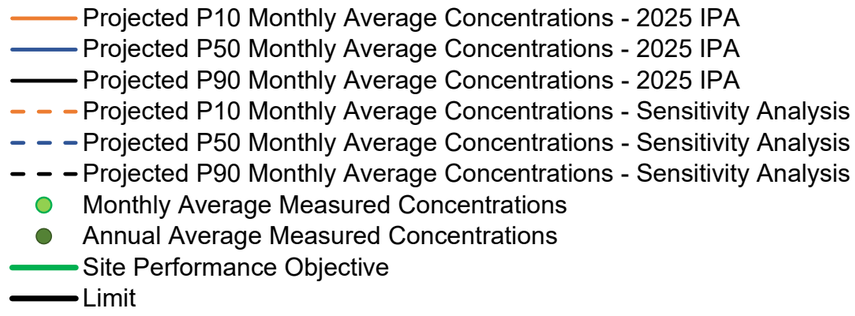
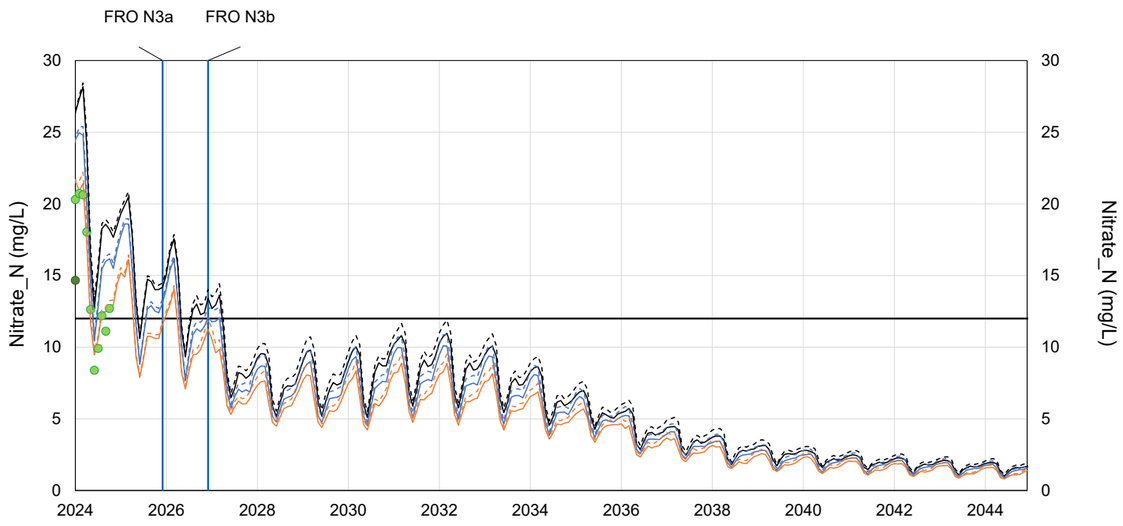
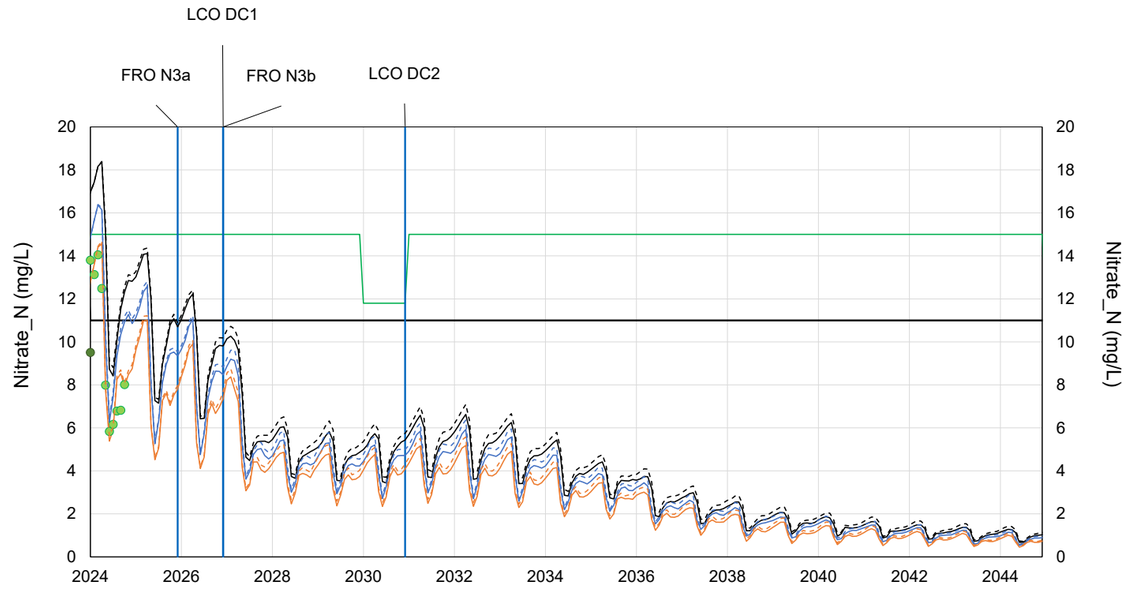


Figure 3.17. Projected Concentrations of Nitrate with and without changes to Saturated Rock Fill Treatment Performance.

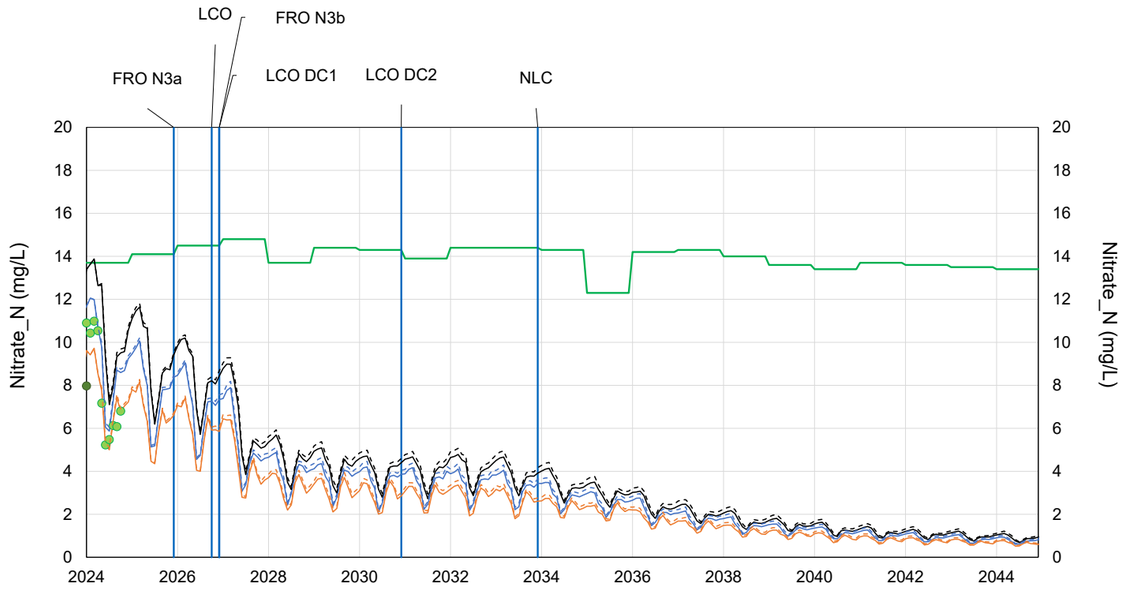
a) FRO Compliance Point (FR_FRABCH; E223753)

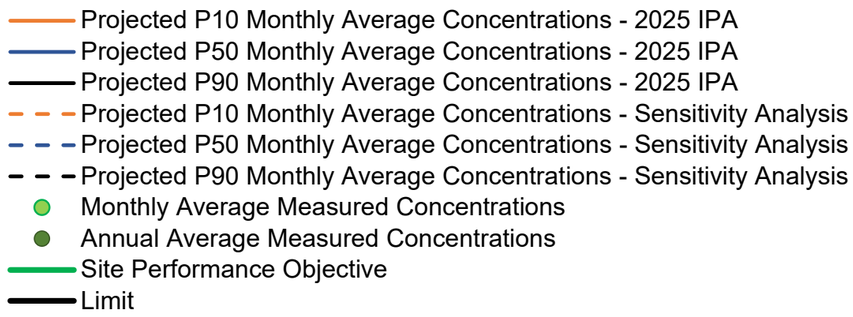


b) Fording River downstream of Greenhills Creek (GH_FR1; 0200378)



c) Fording River downstream of Line Creek (LC_LC5; 0200028)





3.3.3 Changes to Model Inputs Related to Nitrogen Source Control

EVR uses ammonium nitrate fuel oil (ANFO) -based explosives to blast mine rock and expose coal seams as part of open-pit mining at its operations. Release of nitrogen is partitioned into release from explosives usage and exchangeable ammonia. The latter is based on an initial inventory of naturally occurring nitrogen (exchangeable ammonium) in the rock and the remaining nitrogen can be attributed to explosives usage. The use of ANFO explosives for blasting and the degree to which the explosives are incompletely detonated during blasting are the most significant effect of the mining process that potentially influences nitrate concentrations.

Lining of blast holes began in 2017 at EVR's operations in the Elk Valley, the purpose of which is to limit the loss of explosives prior to blasting. Limiting the loss of explosives reduces the amount of explosive residual associated with freshly blasted mine rock, which, in turn, reduces the release of nitrate from mine rock spoils. Investigations completed to support the 2023 RWQM update for the nitrate source terms and reduce the AMP UU 1.2.4. *How do the nitrate source terms need to be adjusted to account for the loading from exchangeable ammonium (naturally present in waste rock) in addition to blasting residuals?* showed that liners are expected to decrease nitrogen exports from blasting practices by more than 99.5% in lined holes.

Lining of blast holes at FRO, GHO, LCO, and EVO is modelled to be 99.5% effective in the 2023 RWQM through the calibration period (for the period that liners were used) and for future projections. A sensitivity analysis was undertaken to assess how variation from planned blast hole lining targets could affect projected nitrate concentrations. This sensitivity analysis was based on the assumption that 10% less holes are lined than the current Nitrogen Management Plan targets. The sensitivity analysis involved reducing liner effectiveness values assigned to lined blast holes at FRO, GHO, LCO and EVO by 10% starting in 2024 to represent a reduction of 10% in the number of lined holes.

As expected, projected nitrate concentrations were slightly higher at Order stations, compliance points, and at the monitoring location LCO Dry Creek downstream of Sedimentation Ponds (LC_DCDS; E295210) from 2024 onwards. Projected P_{90} monthly average nitrate concentrations increase by less than 5% at all Order stations and compliance points; with the exception of the LCO Compliance Point (LC_LCDSSLCC; E297110) in 2033 with an increase of 20% relative to the 2025 IPA. It is important to note that these maximum percent changes are projected for short durations and do not affect the overall downward trend in nitrate concentrations. To illustrate, Figure 3.18 shows predicted concentrations at the FRO Compliance Point (FR_FRABCH; E223753), LCO Compliance Point (LC_LCDSSLCC; E297110) and Fording River downstream of Line Creek (LC_LC5; 0200028).

Projected maximum P_{90} monthly average nitrate concentrations from 2012 to 2057 at the nearest downstream compliance Points and Order stations relative to each operation are presented in the Elk Valley Water Quality Plan – 2025 Implementation Plan Adjustment: Methods and Projected Concentrations of Order Constituents (Hatch 2025a). The average increase in projected maximum P_{90} monthly average nitrate concentrations, relative to the 2025 IPA, is summarized below:

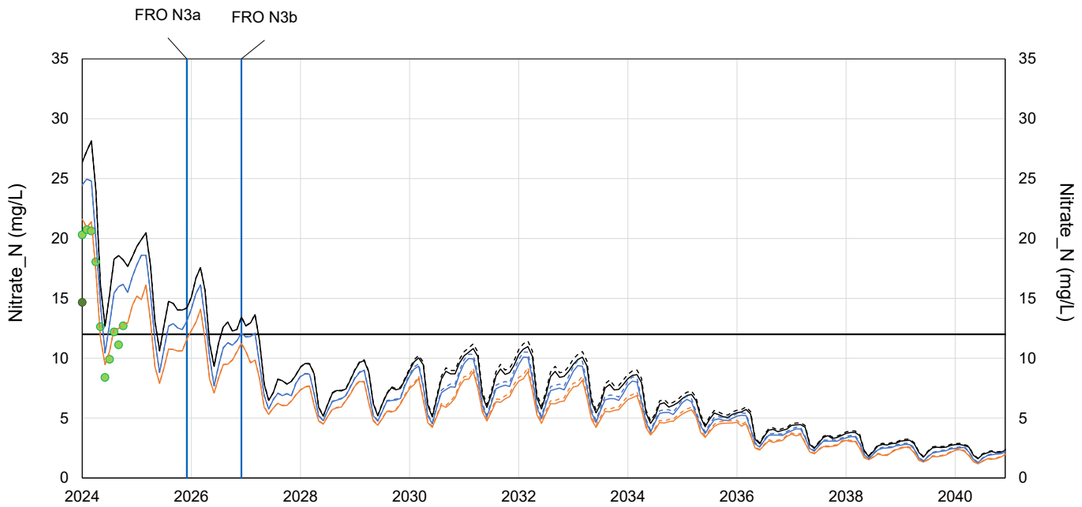
- 0.04 mg-N/L (2%), on average, at the FRO Compliance Point (FR_FRABCH; E223753)
- 0.05 mg-N/L (or 1%), on average, at LCO Dry Creek downstream of the Sedimentation Ponds (LC_DCDS; E295210)
- 0.02 mg-N/L (or 2%), on average, at the LCO Compliance Point (LC_LCDSSLCC; E297110)
- 0.003 mg/L (or 1%), on average, at the GHO Elk River Compliance Point (GH_ERC; E300090)
- 0.003 mg-N/L (or 1%), on average, at the EVO Harmer Compliance Point (EV_HC1; E102682)
- 0.01 mg-N/L (or 2%), on average, at the EVO Michel Creek Compliance Point (EV_MC2; E300091)

- The absolute difference is less 0.02 mg-N/L (or 2%), on average, at all Order stations.

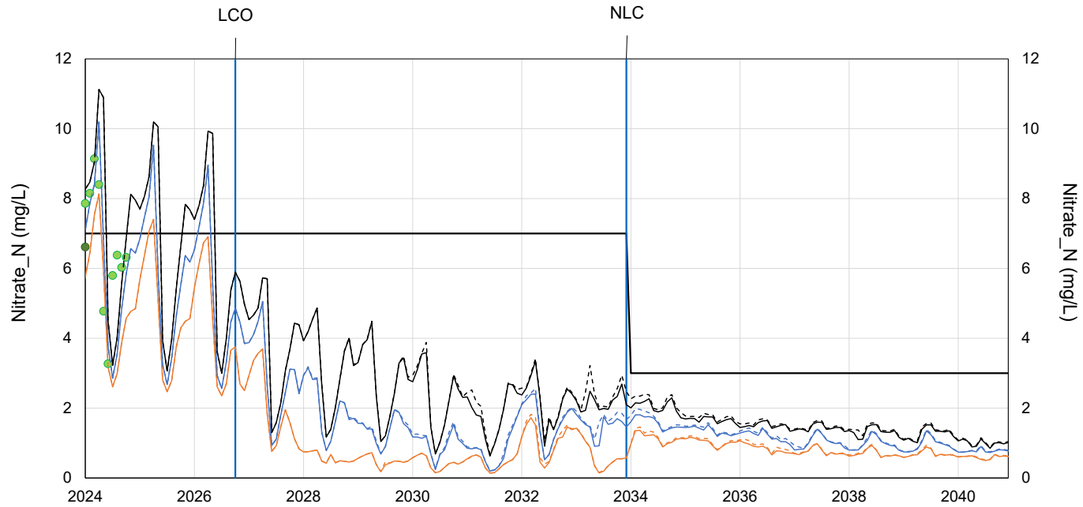
Results from this analysis indicate that decreasing the number of lined blast holes by 10% would not result in a higher potential risk to nitrate compliance.

Figure 3.18. Projected Nitrate Concentrations with and without Changes to Nitrogen Source Control.

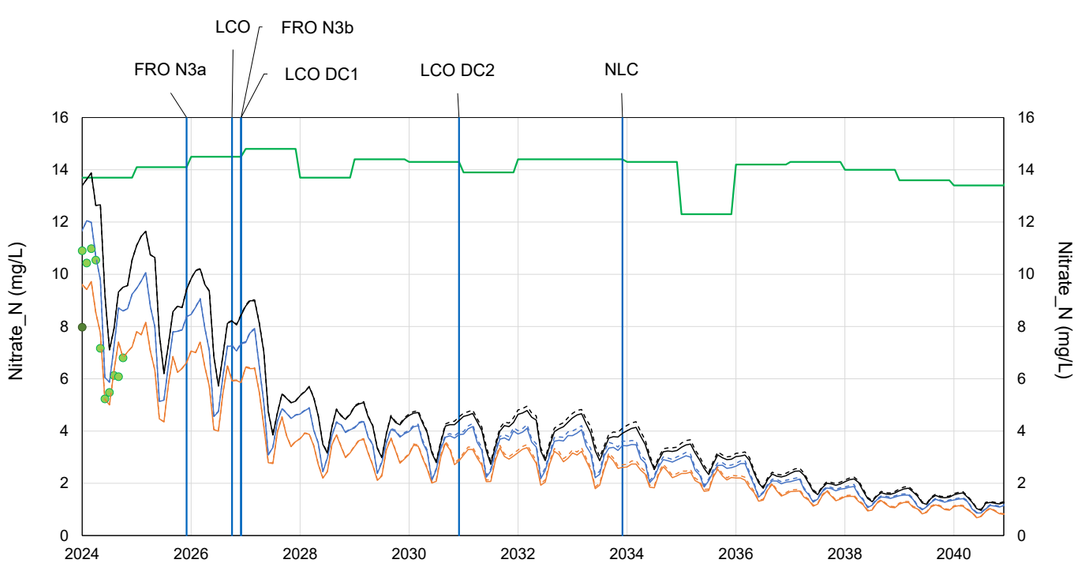
a) FRO Compliance Point (FR_FRABCH; E223753)

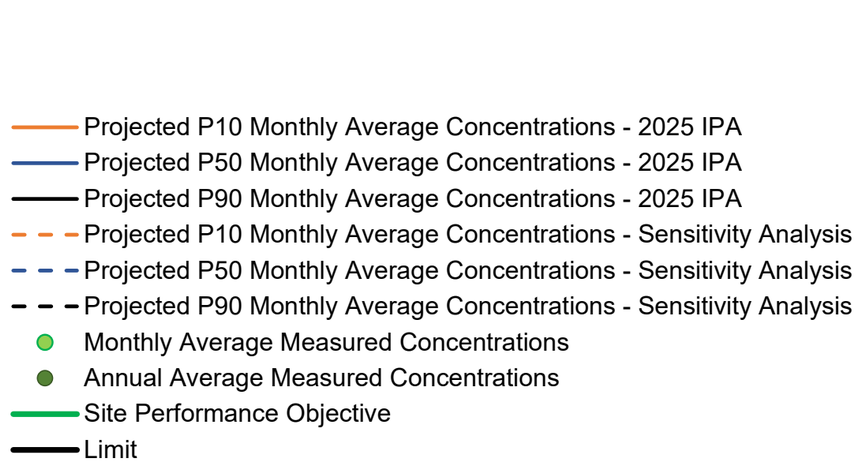


b) Line Creek Compliance Point (LC_LCDSSLCC; E297110)



c) Fording River downstream of Line Creek (LC_LC5; 0200028)





3.3.4 Changes to Model Inputs Related to Climate

This sensitivity analysis was undertaken to understand the potential influence of climate change on projected concentrations of nitrate, selenium, and sulphate in the Elk Valley. To evaluate the potential impact of climate change, the 2023 RWQM was run using an ensemble of 20 climate forcing realizations.

The underlying source for the future climate datasets captured in this study was the Canadian Downscaled Climate Scenarios–Multivariate dataset (CanDCS-M6), a statistically downscaled product of 26 global climate models (GCMs) from the sixth Coupled Model Intercomparison Project (CMIP6). A subset of 9 GCMs that were identified for use in British Columbia by the Pacific Climate Impacts Consortium were utilized for this sensitivity assessment input. Subsequently, downscaling, bias correction, and elevation-based lapse corrections were applied to refine the spatial resolution, producing daily, catchment-averaged temperature and precipitation datasets suitable for direct input into the 2023 RWQM. The resulting climate forcing inputs span from 1950 to 2125 across 36 GCM–Shared Socioeconomic Pathways (SSP) (9 GCMs and 4 SSPs per GCM) scenarios, complemented by historical climate reference data. From the processed CanDCS-M6 datasets, three distinct 20-member climate ensembles were developed, each tailored to specific applications:

1. The Historical Performance Ensemble was curated based on models with the highest skill to replicate observed historical climate data, making it optimal for screening analyses and general sensitivity assessments.
2. The Bounding Envelope Ensemble captures the widest plausible range of projected climate extremes, providing a robust foundation for stress-testing and risk evaluations.
3. The Central Tendency Ensemble represents median climate projections, best suited for routine planning or design applications.

For the purposes of this sensitivity analysis, the Bounding Envelope Ensemble was selected as a conservative approach to include coverage of the upper and lower bounds of predicted climate change relative to historical baseline conditions. The Bounding Envelope Ensemble allows maximum uncertainty quantification and assessment of worst-case and best-case scenarios while maintaining a manageable number of realizations to limit the computational time. The 20 climate forcing realizations included as part of the Bounding Envelope Ensemble evaluated in this sensitivity analysis are described in Hatch (2025a) and Hyaltus (2025).

With the consideration of climate change in the 2025 IPA, additional non-compliances were not projected for selenium, nitrate, and sulphate at the majority of compliance points and Order stations from 2025 to 2125. The following exceptions were identified for projected P_{90} monthly average selenium and sulphate concentrations above applicable limits or SPOs:

- GHO Elk River Compliance Point (GH_ERC; E300090): selenium during discrete time periods from 2038 to 2041
- EVO Harmer Compliance Point (EV_HC1; E102682): selenium during discrete time periods from 2025 to 2052
- EVO Michel Creek Compliance Point (EV_MC2; E300091): selenium from 2040 onwards
- CMO Compliance Point (CM_MC2; E258937): selenium from 2025 onwards and sulphate from 2025 to 2050

With the consideration of climate change in the 2025 IPA, there is generally a decline in P_{90} and P_{10} monthly average concentrations during both low and high flow seasons at most compliance points and Order stations (e.g., FRO Compliance Point (FR_FRABCH; E223753) in Figure 3.19a, Fording River downstream of Line Creek (LC_LC5; 0200028) in Figure 3.19b, and Elk River downstream of Michel Creek (EV_ER1; 0200393) in Figure 3.19c). At the GHO Elk River Compliance Point (GH_ERC; E300090) and EVO Harmer Compliance Point (EV_HC1; E102682), P_{50} projected concentrations are similar with and without the consideration of climate

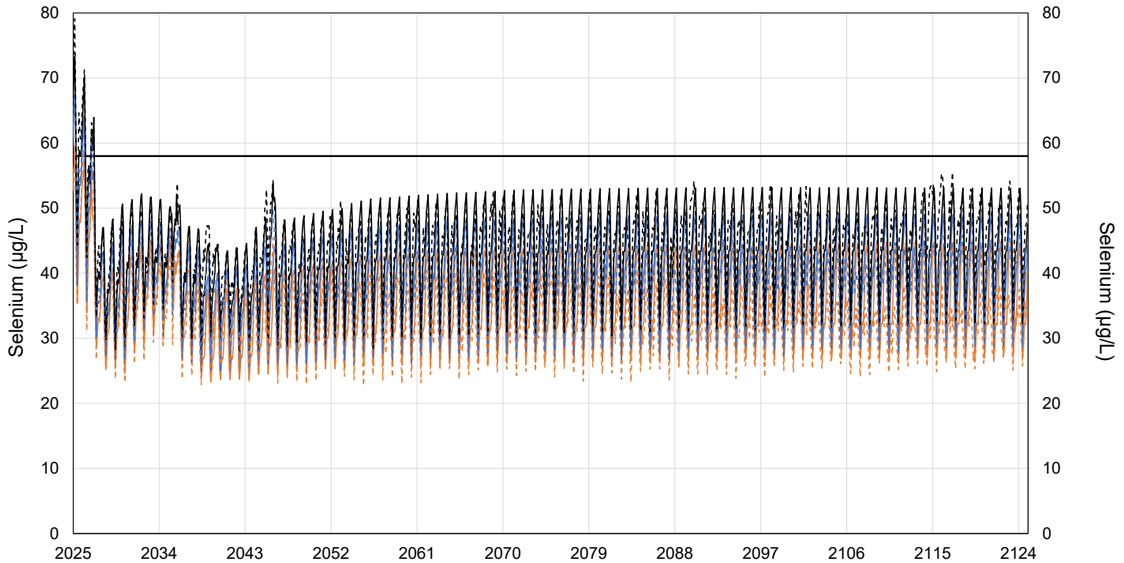
change; however, P_{90} peak concentrations are generally higher and P_{10} concentrations are lower with the consideration of climate change.

At the EVO Michel Creek Compliance Point (EV_MC2; E300091), CMO Compliance Point (CM_MC2; E258937), and Elk River upstream of Grave Creek (EV_ER4; 0200027), projected concentrations tend to increase under decreased flow conditions associated with climate change. Notably, at the CMO Compliance Point (CM_MC2; E258937), projected concentrations are generally higher with the consideration of climate change. The climate change projected flows at CM_MC2 are substantially lower relative to the 2025 IPA without consideration of climate change. The projected decrease in flows and increase in concentrations at EV_MC2 in the 2023 RWQM with climate change considered are likely because of the propagation of underpredicted flows upstream from CMO Compliance Point (CM_MC2; E258937).

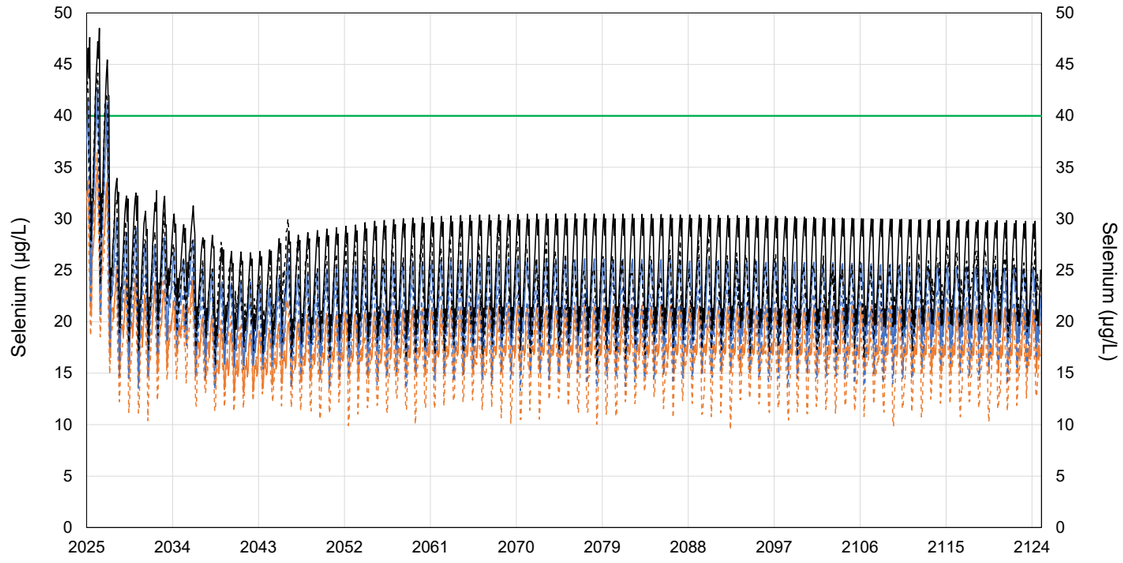
The GCM inputs result in substantial overprediction of concentrations and underprediction of flows at CMO Compliance Point (CM_MC2; E258937) in the 2023 RWQM, particularly during the historical period of the GCMs (i.e., 1970 to 2012). The baseline dataset used to bias correction the CanDCS-M6 tends to overestimate precipitation in higher elevation, data sparse portions of the watersheds while underrepresenting localized orographic precipitation patterns. These discrepancies arise from known limitations of the underlying interpolation methodology and the scarcity of high elevation climate stations in complex mountainous terrain. The regional biases identified do not invalidate the projections but should be considered when interpreting future climate impacts in the Elk Valley, for example by evaluating predicted changes relative to the simulated historical baseline to reduce the influence of these structural biases. It is also important to note that hydrologic model assumptions and load releases are calibrated under current climate and hydrologic conditions. Additional bias correction of the GCM inputs is necessary to address systematic biases affecting climate forcings at the CMO Compliance Point (CM_MC2; E258937) as well as the catchments upstream of this location. This work is ongoing and will be incorporated into future climate change evaluations.

Figure 3.19. Projected Concentrations of Selenium with and without changes to Climate Change (Continued).

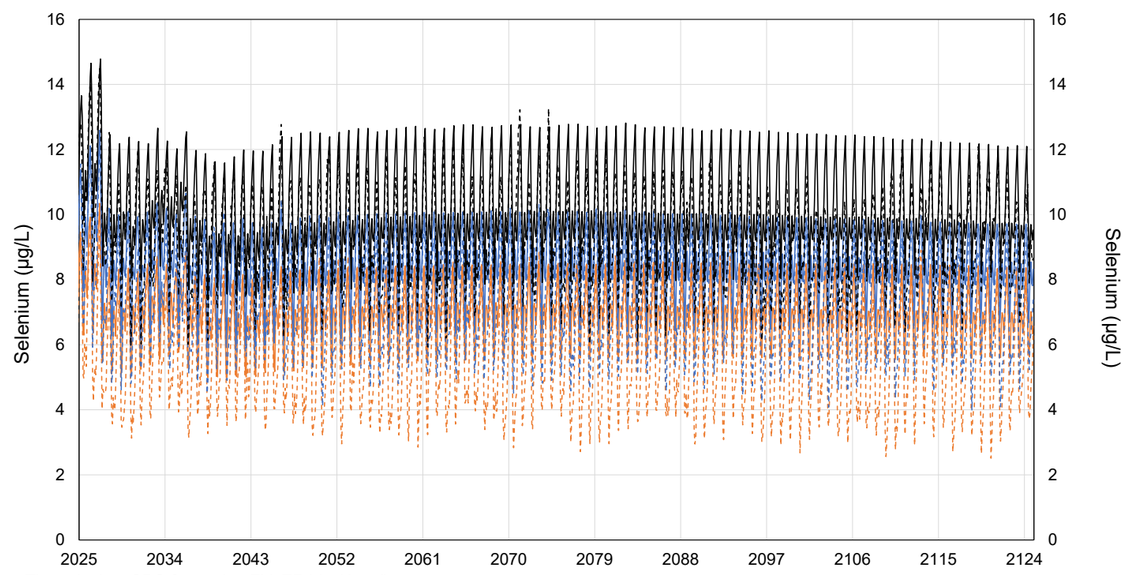
a) FRO Compliance Point (FR_FRABCH; E223753)

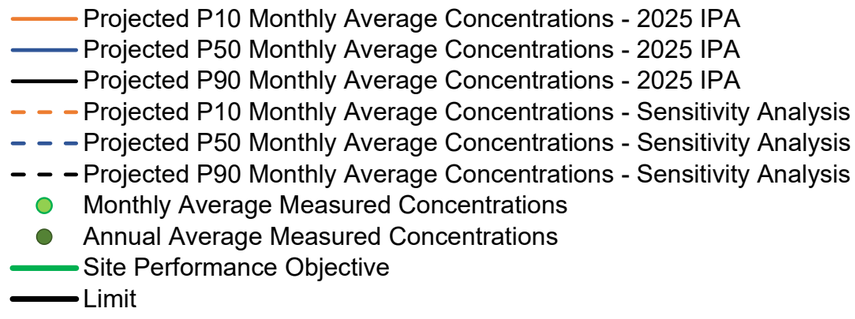


b) Fording River downstream of Line Creek (LC_LC5; 0200028)



c) Elk River downstream of Michel Creek (EV_ER1; 0200393)





Note: The selenium SPO for station EV_ER1 is 19 µg/L.

3.4 Integrated Effects Assessment

The objective of the integrated effects assessment (IEA) is to evaluate potential area-based effects to aquatic health for each management unit during periods when water quality is projected to be potentially greater than compliance limits and SPOs. Constituent-specific assessments were conducted for nitrate, sulphate, and selenium using the approach developed for the EVWQP (Teck 2014), with recent refinements to aquatic health tools as applied in the 2022 IPA (Teck 2022). The IEA is presented in WSP (2025) and an overview of methods and a summary of the findings is presented below.

Like the 2022 IPA, the incorporation of refined assessment tools for aquatic health reduces uncertainty in the assessment. Reductions in uncertainties occurred in two main areas: 1) incorporation of updated nitrate and sulphate effect concentrations for sensitive fish, invertebrates, and amphibians; and 2) incorporation of improvements in selenium speciation monitoring and bioaccumulation modelling to account for a gradient of aqueous organoselenium concentrations. These tools represent the best available technical information, were developed and calibrated with review by the Environmental Monitoring Committee for use in the Elk Valley, and have undergone periodic validation and adjustments to improve predictive ability. In consideration of the above, the refined tools improve confidence in the effects predictions.

The approach for the IEA was to first compile 90th percentile (P_{90}) projected water quality concentrations for mainstem and tributary areas throughout the Elk Valley during periods when water quality was projected to be potentially above compliance limits or SPOs for a MU (see Table 3.3), and for a subsequent period when water quality was projected to be below compliance limits and SPOs for those MUs. The EVWQP divided the Designated Area into six MUs (i.e., MU1 – MU6). Specifically, the assessment periods were as follows:

- Nitrate and selenium (MU1, MU2, and MU4): the maximum monthly P_{90} concentration for individual years from 2025 to 2027, and for the maximum monthly P_{90} concentration from 2028 to 2035.
- Sulphate (MU1): the maximum monthly P_{90} concentration for individual years from 2025 to 2027, for the maximum monthly P_{90} concentration from 2028 to 2035, and for the maximum monthly P_{90} concentration from 2036 to 2057. For sulphate, a sensitivity analysis was also conducted to evaluate potential area-based effects to aquatic health for a no treatment scenario; for this analysis, the maximum monthly P_{90} concentration between 2025 to 2057 was evaluated (i.e., a period that encompasses years that are projected to be potentially both in and out of compliance in the 2025 IPA scenario [Table 3.3]).

These data were used to predict potential effects to aquatic receptors (benthic invertebrates, fish, amphibians, and aquatic-feeding birds [selenium only]) using concentration-response models. Results for individual stations were spatially integrated using an area-weighted approach (MU1, MU2, and MU4) or a fish use approach (MU1). Spatially integrated results were then compared to screening criteria for area-based protection of aquatic ecosystem health, as defined in the EVWQP (Teck 2014)[6].

Where screening criteria were met, projected water quality conditions were interpreted to be protective of aquatic health in the MU. Not meeting screening criteria does not necessarily mean that aquatic health will not be protected; however, such results do require further evaluation to characterize the level of potential risk to aquatic health.

[6]For fish and amphibians, the assessment criteria are a <10%integrated effect in each MU to the most sensitive endpoint and a <10% effect in each mainstem river segment. For benthic invertebrates, the assessment criteria are a <20%integrated effect in each MU to the community endpoint and a <20% effect in each mainstem river segment.

Key findings of the integrated assessment are summarized by constituent:

- Nitrate—Screening criteria were met for benthic invertebrates, fish, and amphibians for all assessment periods (2025-2035) in all assessed MUs (1, 2, and 4).
- Sulphate—Screening criteria were met for benthic invertebrates, fish, and amphibians for all assessment periods (2025-2057) in MU1 for the IPA scenario (i.e., with sulphate treatment) and no treatment scenario (i.e., without sulphate treatment).
- Selenium—Screening criteria were met for benthic invertebrates, amphibians, and aquatic-feeding birds for all assessment periods (2025-2035) in all assessed MUs (1, 2, and 4), and for fish for all assessment periods (2025-2035) in MU2 and MU4. For fish in MU1, screening criteria were met for fish reproduction and the integrated effect criterion was met for juvenile fish growth; however, the mainstem criterion was not met for juvenile fish growth; these results are discussed further below.

Selenium in MU1 (Juvenile Fish Growth)

The integrated effect size for juvenile fish growth was low in all assessment periods (i.e., 4% weighted by area and 5% weighted by fish use) (WSP 2025). Despite the low integrated effect size, results for each assessment period indicate a potential for low-level growth effects (up to 13%) to juvenile fish feeding in the mainstem Fording River immediately downstream of the Fording River South Active Water Treatment Facility (FRO AWTF-S), which represents 2% of mainstem habitat [0.74 hectares] in MU1. The magnitude of estimated effects in these subunits is comparable to the 10% level of response defined by CCME (2007) and ENV (2019) as a threshold for “no negative effects” in laboratory testing. Given the low integrated effect size (4-5%) and that areas of the mainstem Fording River with potential effects above 10% were spatially limited (2% of MU1 mainstem habitat) and of low magnitude (13% effect), selenium conditions across MU1 are expected to be protective of aquatic health, although with lower confidence relative to other MUs that met screening criteria.

Results for juvenile fish growth reflect the influence of organoselenium, which has increased in both magnitude and spatial extent since commissioning of the FRO-S AWTF (EVR 2024a; Minnow 2025). In the area downstream of the FRO-S AWTF, approximately half of the future estimated BIT selenium concentration was due to the contribution of organoselenium (calculated from 2024 measured concentrations), and the remainder due to projected total selenium. EVR continues to implement management activities to reduce organoselenium generation and/or concentrations, and if successful, could reduce concentrations relative to those assumed in this assessment.

As discussed in WSP (2025), this reach of the mainstem Fording River has measured benthic invertebrate tissue selenium concentrations that are consistently higher than those predicted by the selenium speciation model (Minnow 2025). Because of this, the magnitude and spatial extent of estimated effects to juvenile growth in the upper Fording River downstream of the FRO AWTF-S for future assessment periods is lower than that observed in 2024 monitoring data. Increased selenium bioaccumulation in this localized area is related to the influence of water treatment infrastructure at the FRO-S AWTF. EVR is actively addressing this condition through adaptive management, including operational adjustments to the FRO-S AWTF and monitoring if those adjustments improve conditions downstream of the facility. Because tools do not exist to project future changes to organoselenium concentrations and IPA treatment to achieve regional compliance would not be expected to resolve these localized conditions, the assessment assumed that that these localized deviations from model predictions would be resolved through adjustments to management (EVR 2024a). In consideration of the above,

the interpretation for future assessment periods assumes that EVR's management activities in the Fording River reach noted above will be successful.

Based on the above results, projected water quality conditions as presented in the 2025 IPA are expected to be protective of aquatic health in the MUs, noting the reduced confidence in this conclusion for selenium in MU1. Conditions in the upper Fording River downstream of the FRO AWTF-S are the subject of active investigation and management activities related to selenium speciation and bioaccumulation, and the interpretation for future assessment periods in MU1 assumes that these activities will be successful.

4 Next Steps and Future Implementation Plan Adjustments

The mitigation outlined in the 2025 IPA is expected to result in the continued stabilization and reduction of selenium and nitrate concentrations at the compliance points and Order stations in the Elk Valley and the stabilization of sulphate concentrations. The 2025 IPA includes mitigation that is already operational (FRO AWTF-S, WLC AWTF, FRO-N SRF and EVO SRF), that is under construction or in commissioning (i.e. FRO-N SRF Phase 3a, LCO AWTF, and LCO Dry Creek AWTF) and outlines future mitigation in various stages of the project development cycle.

The 2025 IPA schedule over the next five years is expected to be feasible, is based on the current improved understanding of water quality and is specifically designed to achieve compliance as soon as possible. It is dependent upon the assumption of receiving all applicable authorizations in a timely manner. The 2025 IPA is aligned with the objectives of the EVWQP to support healthy ecosystems which is support by the IEA completed for the 2025 IPA.

The next update to the IPA will be completed by September 30, 2030, following submission of the next updates to both the Terms of Reference and the RWQM on September 30, 2029.

4.1 Executing the 2025 Implementation Plan Adjustment

The 2025 IPA guides project planning and detailed engineering by identifying the operational date, sources for treatment, and preliminary capacity of the individual water mitigation projects or expansions required to support the EVWQP. Information gained through the various project stage gates leading up to final engineering and permitting will be used to optimize the projects, meaning that the final configurations may vary from what is included in the 2025 IPA. The schedule is also based on the assumption of receiving all applicable authorizations in a timely manner. The most important items to be advanced to execute the 2025 IPA over the next five years to support compliance with Permit 107517 water quality compliance limits and SPOs, are presented below by operation.

At FRO, EVR is operating the Kilmarnock Clean Water Diversion, FRO AWTF-S, and FRO-N SRF Phase 2. The permit to operate Phase 3a of FRO-N SRF is under review. The following is the list of future facilities and phases of treatment at FRO for the next five years and the 2025 IPA operational dates:

- FRO-N SRF Phase 3a: operational date by December 31, 2025 – under regulatory review
- FRO-N SRF Phase 3b, operational date by December 31, 2026 – in feasibility and regulatory application submissions planned for end of 2025.

At LCO, EVR continues to operate the WLC AWTF and is currently upgrading and expanding this facility, operations planned by October 1, 2026:

- Debottlenecking of the biological component to increase the nitrate loading capacity
- Addition of membrane-HDS
- Collection of NLC and MSAW Pit influent sources
- NNC Clean Water Diversion

Phase 1 of the LCO DC AWTF is under construction and planned to begin operating at the end of 2026.

At EVO, the EVO SRF and supporting infrastructure continue to be operational.

In parallel to executing treatment, EVR will continue to advance source control technologies (including SOZs) that could replace or supplement treatment in future adjustments to the implementation plan.

EVR is focused on continuing to improve mine design for the purpose of minimizing constituent release. This includes targeting water treatment sources from within the mine footprint (improving water availability); utilizing existing pits and mine rock spoils for future mine rock placement and SRF development; and minimizing impact to new drainages. These considerations are being built into future planned mining areas to minimize additional treatment requirements. In addition, adjustments of the implementation plan are anticipated as alternative technologies are advanced, proven and incorporated in the RWQM in an effort to reduce reliance on treatment.

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