
Elk Valley Water Quality Plan

Annex C.8

Consultation Consideration Memo

Consultation Consideration Memo

July 16, 2014

Consideration of Input

Consistent with Section 4.2.1.4 of the Terms of Reference required by Ministerial Order No. M113 (the Order), the input received during consultation has been considered, along with technical and socio-economic information, in the development of the Elk Valley Water Quality Plan (the Plan).

The following table summarizes input received during the three phases of consultation regarding the Plan, and Teck's consideration of the input in developing the Plan. Topics are listed in alphabetical order.

INPUT	SOURCE	CONSIDERATION OF INPUT
<p>Access to historical data and future projections</p> <ul style="list-style-type: none"> Some consultation participants expressed a desire for Teck to provide data showing historical selenium level increases and projections of future selenium levels with treatment. One participant asked to see predicted selenium levels for Lake Koochanusa where water crosses the US border. 	<p>Phase 2 Phase 3</p>	<ul style="list-style-type: none"> Charts showing measured selenium concentrations from past years at each of the Order stations, including Lake Koochanusa, and the anticipated selenium trend as mitigation measures are implemented, are included in Chapter 8 of the Plan. See Chapter 8 for more detail.
<p>Adaptive management of the Plan</p> <ul style="list-style-type: none"> Some consultation participants were interested in how changes would be made to the Plan following its implementation, suggesting that defined timelines need to be set for the review of the Plan. Some consultation participants noted that the Plan should be flexible and adaptable to account for variables and uncertainty. 	<p>Phase 1</p>	<ul style="list-style-type: none"> The Plan will be implemented within an adaptive management framework, which is a systematic process for deliberately learning during the Plan implementation to confirm that the objectives of the Plan are being met and to adjust and improve management actions as required. See Chapter 11 for more detail.
<ul style="list-style-type: none"> Consultation participants indicated that they would be most interested in being notified and consulted about ongoing monitoring and adaptive management of the Plan through a website and online feedback form, receiving notice of opportunities to provide feedback on the implementation of the Plan, and by attending a community information and feedback session. Reading an annual report of the Plan was received with less interest. 	<p>Phase 2</p>	<ul style="list-style-type: none"> The Plan proposes that Teck will report on progress and provide stakeholders with opportunities to provide feedback during implementation of the Plan. Information will be provided and feedback collected through a number of avenues, including the Plan website: www.teck.com/elkvalley. See Chapters 3 and 11 for more detail.
<ul style="list-style-type: none"> Some consultation participants stated that Teck should provide frequent and easy to understand updates and reports regarding the Plan. 	<p>Phase 2</p>	<ul style="list-style-type: none"> The Plan proposes that Teck will report on progress and provide stakeholders with opportunities to provide feedback during implementation of the Plan. See Chapter 3 for more detail.
<p>Baseline studies</p> <ul style="list-style-type: none"> Some participants wanted to know more about the extent of the baseline studies completed and questioned whether the baseline studies would be able to provide a sufficiently clear enough indication of whether the Plan is successful or not. 	<p>Phase 3</p>	<ul style="list-style-type: none"> As part of Plan development, current baseline conditions were examined for surface water quality, sediment quality and constituent concentrations in tissues of aquatic organisms, individually and cumulatively. These conditions provide context for the development of the Plan. See Chapter 4 for more detail.

INPUT	SOURCE	CONSIDERATION OF INPUT
<p>Calcite management</p> <ul style="list-style-type: none"> Some participants asked for more information about calcite and how Teck was addressing the formation of calcite in the Plan. 	Phase 3	<ul style="list-style-type: none"> Four streams—Greenhills Creek, Corbin Creek, Dry Creek and Erickson Creek—were identified in the Plan as priority streams for calcite management. Calcite treatment technologies are being evaluated to determine the most effective methods and technologies for implementation at a priority stream within three years. See Chapter 7 for more detail.
<p>Commitment to water-quality management</p> <ul style="list-style-type: none"> Some participants stated that there should be a legally enforceable commitment made by Teck to maintain water quality in the Elk Valley beyond the life of its mines. 	Phase 3	<ul style="list-style-type: none"> Teck’s mine planning accounts for the full life cycle of operations, from operation through closure and full reclamation. The permitting process accounts for post-operation requirements, including water management. See Chapter 2 for more detail.
<p>Communication and consultation with communities and the public</p> <ul style="list-style-type: none"> Some consultation participants suggested that Teck continue to communicate with and consult the public. 	Phase 1 Phase 2	<ul style="list-style-type: none"> The Plan proposes that Teck will report on progress and provide stakeholders with opportunities to provide feedback at key milestones during implementation of the Plan. See Chapters 3 and 11 for more detail.
<p>Communication with employees</p> <ul style="list-style-type: none"> Some consultation participants suggested that Teck ensure that its workers know that a goal of the plan is to ensure that mining operations can continue. 	Phase 1	<ul style="list-style-type: none"> The Plan proposes that Teck will report on progress and provide stakeholders, including employees, with opportunities to provide feedback at key milestones during implementation of the Plan. See Chapters 3 and 11 for more detail.
<p>Consultation process</p> <ul style="list-style-type: none"> Some consultation participants noted that the public consultation process as part of the Plan is good and important. 	Phase 1	<ul style="list-style-type: none"> Detail on consultation undertaken as part of development of the Plan and feedback received is included in Chapter 3.
<p>Consideration of constituents not named in the Order</p> <ul style="list-style-type: none"> Some consultation participants asked how constituents other than selenium, sulphate, nitrate and cadmium would be considered in the development of the Plan. 	Phase 1	<ul style="list-style-type: none"> Other constituents not specified in the Order were examined through the current baseline conditions assessment. Water-quality data measurements for 73 constituents, collected over the past three years were evaluated to assess current baseline conditions. See Chapter 4 for more detail.

INPUT	SOURCE	CONSIDERATION OF INPUT
<ul style="list-style-type: none"> One participant asked about high radon gas readings in Sparwood and whether they were connected to coal mining activities. 	Phase 3	<ul style="list-style-type: none"> Radon is a noble gas that is associated with uranium in soils; it is not associated with coal mining activities. Additional information on radon can be found at https://www.interiorhealth.ca.
<p>Draft site-specific benchmarks</p> <ul style="list-style-type: none"> Some consultation participants asked why the draft site-specific benchmarks for the protection of aquatic life are different for different bodies of water. 	Phase 2	<ul style="list-style-type: none"> Water-quality benchmarks for all Order constituents were set following a six-step approach that considered protection of both aquatic and human health. See Chapter 8 for more detail.
<p>Draft site-specific benchmarks</p> <ul style="list-style-type: none"> Some participants were interested in the rationale behind the use of westslope cutthroat trout as the sentinel species in the assessment of fish populations and health within the Elk Valley. 	Phase 3	<ul style="list-style-type: none"> Water-quality benchmarks for fish in the upper Fording River (above Josephine Falls) were based on westslope cutthroat trout because this is the only fish species present in that part of the watershed. On the recommendation of the Technical Advisory Committee (TAC), brown trout was used to derive the Elk River benchmark because, while not present in the system, it is the most sensitive tested species tested to date and serves as a conservative surrogate for other species. See Chapter 8 for more detail.
<p>Drinking water and well testing</p> <ul style="list-style-type: none"> Some consultation participants asked what consideration has been given to testing well water to ensure that drinking water is safe and how this would be addressed in the Plan. 	Phase 1 Phase 2	<ul style="list-style-type: none"> As part of the development of the Plan, Teck conducted testing of 91 drinking water sources. This information is presented in Chapter 5, which details how protection of groundwater is addressed through the Plan.
<p>Drinking water and well testing</p> <ul style="list-style-type: none"> Some participants wanted more information about the closure of the District of Sparwood's municipal well due to elevated selenium levels and requested additional information about the location of a new well. 	Phase 3	<ul style="list-style-type: none"> Sparwood's Well #3 was temporarily taken out of service in March 2014 due to selenium concentrations that exceeded the levels listed in the Guidelines for Canadian Drinking Water Quality (10 µg/L). The well has since been put back into service because selenium levels have dropped. The District of Sparwood, with support from Teck, is replacing Well #3 with a new independent water source.

INPUT	SOURCE	CONSIDERATION OF INPUT
<p>Ecosystem health</p> <ul style="list-style-type: none"> Some consultation participants noted that the environment must be protected first and foremost. 	Phase 1	<ul style="list-style-type: none"> The primary objective of the Plan is to maintain the health of the watershed while allowing for continued, sustainable mining. Teck is focused on responsible resource development and has implemented a sustainability strategy that focuses on key areas, including water and biodiversity. See Chapters 1, 4, 8 and 10 for more detail.
<p>Effects of selenium on human health</p> <ul style="list-style-type: none"> A participant advised that research be done to determine how much selenium is toxic for humans and what treatment could be available to reduce selenium levels in humans should they become toxic. 	Phase 1 Ktunaxa Consultation	<ul style="list-style-type: none"> An assessment was conducted to identify any potential human health risk associated with selenium and other constituents identified in the Order. See Chapter 5 for more detail.
<p>Effects of selenium on fish and wildlife</p> <ul style="list-style-type: none"> Some consultation participants sought more information regarding the effects of selenium on fish, particularly what types of effects could be expected and whether selenium bio-accumulates or bio-magnifies (increases exponentially as it moves up the food chain). 	Phase 2 Ktunaxa Consultation	<ul style="list-style-type: none"> An examination of the effects of selenium on fish and other aquatic organisms, including bioaccumulation, was conducted as part of setting water-quality benchmarks. Selenium does not bio-magnify in the food chain. See Chapter 8 for more detail.
<p>Effects of selenium on birds and wildlife</p> <ul style="list-style-type: none"> Some consultation participants asked whether Teck had studied the concentration of selenium in birds and mammals. 	Phase 2 Phase 3 Ktunaxa Consultation	<ul style="list-style-type: none"> An examination of the effect of selenium on fish and other aquatic organisms including birds was conducted as part of setting water-quality benchmarks. See Chapter 8 for more detail.
<p>Expansion of mine operations</p> <ul style="list-style-type: none"> Some participants asked if Teck was planning to expand any of its operations in the Elk Valley. 	Phase 3	<ul style="list-style-type: none"> Teck is currently working on projects to extend the life of its existing operations at their current levels of production. This is necessary to maintain current levels of employment and economic activity connected to mining in the region.
<p>Future industrial development</p> <ul style="list-style-type: none"> Some consultation participants asked how the Plan would accommodate or consider future industrial development in the Elk Valley. 	Phase 2 Phase 3 Ktunaxa Consultation	<ul style="list-style-type: none"> The focus of the Plan is on coal mining activity in the Elk Valley. The Plan will apply to any future coal mining activity in the Elk Valley, whether conducted by Teck or another company.

INPUT	SOURCE	CONSIDERATION OF INPUT
<p>Government policy</p> <ul style="list-style-type: none"> • One respondent expressed several detailed concerns, aimed primarily at the provincial government, regarding the policy vacuum with respect to acceptable risk from the constituents of potential concern in the Order, namely: <ul style="list-style-type: none"> - The lack of clear (or any) policy regarding acceptable risk when Water Quality Guidelines (WQGs) are exceeded. - The lack of integration across ministries within the context of the new Integrated Decision Making model, as well as the requirement for sustainability across economic, social and environmental factors. - The need for clear support and direction to statutory decision makers and their technical support staff regarding the relative role of science and policy in their decisions (the two are related but not equivalent). 	Phase 3	<ul style="list-style-type: none"> • Feedback noted and included for the information of government.
<p>Historic Impacts of Mining</p> <ul style="list-style-type: none"> • A participant wanted to know whether historic impacts of mining would be dealt with as part of the Plan 	Ktunaxa Consultation	<ul style="list-style-type: none"> • The Plan will address water quality challenges related to historic, current and planned future coal mining in the Designated Area.
<p>Human and ecosystem health</p> <ul style="list-style-type: none"> • Some consultation participants noted the importance of water quality for human and aquatic ecosystem health. 	Phase 1 Phase 3	<ul style="list-style-type: none"> • The primary objective of the Plan is to maintain the health of the watershed while allowing for continued sustainable mining. • See Chapter 1 for more detail.
<p>Impacts on fishing and tourism industries</p> <ul style="list-style-type: none"> • Some consultation participants expressed concerns about the stigma that the development of the Plan would have on the fishing and tourism industries. 	Phase 1	<ul style="list-style-type: none"> • A socio-economic analysis conducted as part of the development of the Plan suggests fishing and tourism will not be directly affected by implementation of the Plan. • See Chapter 9 for more detail. • Recognizing that continued dialogue with fishing and tourism stakeholders is part of the implementation of the Plan, an ongoing process for consultation is proposed. • See Chapter 3 for more detail.

INPUT	SOURCE	CONSIDERATION OF INPUT
<p>Impacts on fishing and tourism industries</p> <ul style="list-style-type: none"> Some consultation participants requested Teck not underestimate the economic impact of sport fishing, angling and recreational tourism on the economy of the Elk Valley. 	Phase 1	<ul style="list-style-type: none"> Recognizing the economic importance of fishing and tourism, both were included in a socio-economic analysis conducted as part of the development of the Plan. See Chapter 9 for more detail.
<p>Implementation of past recommendations</p> <ul style="list-style-type: none"> Some participants asked about the status of Teck's implementation of specific recommendations that were made in the Valley-Wide Selenium Management Action Plan. 	Phase 3	<ul style="list-style-type: none"> The proposed Valley-Wide Selenium Management Action Plan (VWSMP) was not adopted; however, water treatment and water management strategies in the proposed VWSMP have been considered in the development of the Plan.
<p>Integration with other Plans/Frameworks</p> <ul style="list-style-type: none"> Some consultation participants asked how Teck's Cumulative Effects Management Framework would be integrated with the Plan. 	Phase 1	<ul style="list-style-type: none"> Teck and the Ktunaxa Nation Council are collaborating on a pilot program to develop a cumulative effects management framework for the Elk Valley. Responsibility for this project is being transferred to the provincial government and is in the early stages of development. As a result, it is uncertain how it will be considered during Plan implementation.
<p>Learning from other jurisdictions</p> <ul style="list-style-type: none"> Some consultation participants were interested in whether Teck had looked at what companies in other jurisdictions with similar issues were doing to protect and improve water quality. 	Phase 1	<ul style="list-style-type: none"> Teck has considered the best-available science, including water mitigation techniques and technology, as part of the evaluation of existing water management options. At the same time, specific conditions found in the Elk Valley make it a unique environment in which to manage water quality, and a tailored approach is required. See Chapter 6 for more detail.
<p>Learning from other jurisdictions</p> <ul style="list-style-type: none"> Some consultation participants suggested that Teck look at selenium levels in other jurisdictions with similar geology but which do not engage in mining activities. 	Phase 1	<ul style="list-style-type: none"> Examination of reference areas (areas not affected by mining activity) was part of the work to evaluate current baseline conditions for the Plan. See Chapter 4 for more detail.
<p>Long-term approach</p> <ul style="list-style-type: none"> Some consultation participants agreed with and support the proposed long-term approach. 	Phase 2	<ul style="list-style-type: none"> For more information on the initial implementation plan, see Chapter 8. For more information on research and development (R&D) to identify future mitigation options, see Chapter 6.

INPUT	SOURCE	CONSIDERATION OF INPUT
<p>Long-term approach</p> <ul style="list-style-type: none"> Some consultation participants suggested the use of passive biological water treatment through wetland and aquatic plants and grasses. Some consultation participants were supportive of treatment of waste rock at the source. 	Phase 2	<ul style="list-style-type: none"> The Plan includes ongoing R&D programs through which Teck will identify, assess and improve methods to protect water quality. See Chapter 6 for more detail.
<p>Long-term approach</p> <ul style="list-style-type: none"> Some participants expressed the importance of longer-term planning regarding water quality and use 	Ktunaxa Consultation	<ul style="list-style-type: none"> The Plan will be implemented within an adaptive management framework that will guide water quality management over the longer-term. This process will incorporate data from monitoring and the ongoing R&D program, including potential advancements in technology and techniques to manage water quality over the longer-term. See Chapter 11 for more detail.
<p>Medium-term approach</p> <ul style="list-style-type: none"> Some consultation participants agreed with and supported the proposed medium-term approach. 	Phase 2	<ul style="list-style-type: none"> Feedback noted. For more information on the initial implementation plan, see Chapter 8. For more information on R&D to identify future mitigation options, see Chapter 6.
<p>Medium-term approach</p> <ul style="list-style-type: none"> Some consultation participants stated that Teck must continue monitoring and R&D to learn and improve measures based on the results of the short-term approach. 	Phase 2	<ul style="list-style-type: none"> The Plan will be implemented within an adaptive management framework, which is a systematic process for deliberately learning during the Plan implementation to confirm that the purpose and objectives of the Plan are being met and to adjust and improve management actions as required. This process will incorporate data from monitoring and the ongoing R&D program. See Chapter 11 for more detail.
<p>Medium-term approach</p> <ul style="list-style-type: none"> Some consultation participants stated that a timeframe for the medium-term approach should be defined. 	Phase 2	<ul style="list-style-type: none"> The Plan outlines targets and timelines associated with the approach. See Chapter 8 for more detail.
<p>Mining practices</p> <ul style="list-style-type: none"> Some consultation participants asked whether the Plan would give consideration to changing mining practices, such as utilizing underground mining or slowing down production. 	Phase 2 Phase 3	<ul style="list-style-type: none"> Ongoing assessment conducted through the adaptive management process will be used to confirm that objectives of the Plan are being met and to adjust and improve management actions as required. See Chapter 11 for more detail.

INPUT	SOURCE	CONSIDERATION OF INPUT
<p>Mining practices</p> <ul style="list-style-type: none"> Some consultation participants suggested changes to mining practices and construction of waste rock dumps to minimize contact with water and air. 	<p>Phase 2 Phase 3</p>	<ul style="list-style-type: none"> The Plan includes ongoing R&D programs through which Teck will identify, assess and improve methods to protect water quality. Ongoing assessment conducted through the adaptive management process will be used to confirm that objectives of the Plan are being met and to adjust and improve management actions as required. See Chapters 6 and 11 for more detail.
<p>Mitigation measures</p> <ul style="list-style-type: none"> Some consultation participants expressed support of the proposed mitigation measures. 	<p>Phase 1 Phase 3</p>	<ul style="list-style-type: none"> Feedback noted; no response required.
<p>Mitigation measures</p> <ul style="list-style-type: none"> Some consultation participants noted that dilution of contaminants is not a solution. 	<p>Phase 1</p>	<ul style="list-style-type: none"> Mitigation measures identified for the initial implementation plan are water treatment and water management, e.g., diversions. See Chapter 8 for more detail.
<p>Mitigation measures</p> <ul style="list-style-type: none"> One participant suggested that to mitigate the release of selenium from old creek beds they should be using flora and fauna to help stabilize selenium into a form that does not leach out. 	<p>Phase 1</p>	<ul style="list-style-type: none"> The Plan includes ongoing R&D programs through which Teck will identify, assess and improve methods to protect water quality. Ongoing assessment conducted through the adaptive management process will be used to confirm that objectives of the Plan are being met and to adjust and improve management actions as required. See Chapters 6 and 11 for more detail.
<ul style="list-style-type: none"> Some consultation participants asked whether the use of waste rock covers should be moved up from a long-term approach to be a short- or medium-term approach. 	<p>Phase 2 Phase 3</p>	<ul style="list-style-type: none"> An analysis of waste rock covers was conducted as part of the identification of water management options. Research of waste rock covers continues, but they have not yet been proven to be effective or economical. See Chapters 6 and 11 for more detail.
<p>Mitigation measures</p> <ul style="list-style-type: none"> Some consultation participants asked whether and how long water treatment, monitoring and other mitigation efforts would be maintained should Teck's or subsequent mining operations be discontinued. 	<p>Phase 2 Ktunaxa Consultation</p>	<ul style="list-style-type: none"> Teck is committed to the long-term health of the watershed. Planning for the life of all of Teck's mines goes beyond the operation stage to encompass closure and reclamation, including water-quality issues.

INPUT	SOURCE	CONSIDERATION OF INPUT
<p>Mitigation measures</p> <ul style="list-style-type: none"> Some consultation participants asked for more information regarding the siting of water treatment facilities, noting that, should additional areas be mined in the future, currently planned water treatment facilities may not capture water flowing through new waste rock piles. 	Phase 2	<ul style="list-style-type: none"> The initial implementation plan targets the largest sources of constituents so that water quality can be managed regionally and efficiently. As mine plans are updated, the sources targeted will be evaluated and updated if required. See Chapter 8 for more detail.
<p>Mitigation measures</p> <ul style="list-style-type: none"> Some consultation participants noted that multiple techniques (active water treatment, diversions, etc.) should be employed at the same time to increase the chance of successful mitigation. 	Phase 2	<ul style="list-style-type: none"> The initial implementation plan consists of active water treatment supported by diversions and water management. New technologies and techniques to manage water quality will be assessed during implementation through the adaptive management process. See Chapters 6 for more detail.
<p>Mitigation measures</p> <ul style="list-style-type: none"> Some consultation participants stated that all mine operations should have active water treatment plants. 	Phase 2	<ul style="list-style-type: none"> The initial implementation plan consists of active water treatment supported by diversions and water management. Treatment locations are chosen according to current receiving environment concentrations relative to targets and waste rock volume in place. See Chapter 8 for more detail.
<p>Mitigation measures</p> <ul style="list-style-type: none"> Some consultation participants suggested that high viscosity emulsion (HVE) products should be used in blasting to minimize nitrates. 	Phase 2	<ul style="list-style-type: none"> Both lab and field trials of HVE products have been conducted by Teck. Teck intends to adopt HVE at a larger scale as a leading method to reduce nitrate from entering the receiving environment. See Chapter 6 for more detail.

INPUT	SOURCE	CONSIDERATION OF INPUT
<p>Mitigation measures</p> <ul style="list-style-type: none"> One respondent expressed several detailed concerns regarding the selection of management options and suggested the following: <ul style="list-style-type: none"> Earlier consideration than currently planned for options such as passive treatment, flooded pits, and dump covers. Effective and timely technology transfer of research results. Division of the strategy into options suited to legacy, current and proposed sites. Identification of core and contingent strategies. Integration among relevant Teck activities such as Biodiversity, Cumulative Effects Management, and Fish and Fish Habitat. 	Phase 3	<ul style="list-style-type: none"> Several source control practices have been identified through Teck's R&D program that could improve water quality and, with further development, be implemented at full scale. Teck has an internal technology transfer process. The highest priority research transfer identified to date is the use of saturated fills to treat mine-affected water and the testing of a proprietary method to reduce nitrate losses from blasting. See Chapter 6 for more detail on R&D. The Plan includes an outline of how it will be integrated or coordinated with other existing or proposed plans for the Elk Valley, such as Biodiversity and the Cumulative Effects Management Framework. See Chapter 11 for more detail on integration with other management plans.
<p>Mitigation measures</p> <ul style="list-style-type: none"> One participant expressed concerns with how construction of clean water diversions may disturb sensitive ecosystems around watercourses and suggested that Teck should offset any disturbance by replacing habitat. 	Phase 3	<ul style="list-style-type: none"> Any proposed clean water diversions will be developed to meet all environmental regulatory requirements and steps will be taken to mitigate any potential environmental effects.
<p>Mitigation measures</p> <ul style="list-style-type: none"> One participant included a link to a press release from GE regarding the installation of a water treatment facility in a mine in northeast British Columbia and asked whether Teck or other mining companies in British Columbia were considering using this technology to remove selenium and nitrate. 	Phase 3	<ul style="list-style-type: none"> Teck has reviewed, tested and piloted various water treatment technologies since 2011. Through this assessment, biological treatment has emerged as the leading technology for the removal of nitrate and selenium. The active water treatment technology program (part of the R&D program) will continue to track known treatment technologies, with additional bench testing where warranted. See Chapters 6 and 11 for more detail.
<p>Mitigation measures</p> <ul style="list-style-type: none"> One participant stated that the three active water treatment facilities outlined in the Phase 3 Discussion Guide should be constructed and in operation before any further mining expansion is approved. 		<ul style="list-style-type: none"> Teck is currently proposing projects to extend the life of its existing operations at their current levels of production. This is necessary to maintain current levels of employment and economic activity connected to mining in the region.

INPUT	SOURCE	CONSIDERATION OF INPUT
<p>Monitoring</p> <ul style="list-style-type: none"> Some consultation participants stated that there is a need for a monitoring program to determine the effectiveness of mitigation measures. 	<p>Phase 2 Phase 3</p>	<ul style="list-style-type: none"> Teck will update the existing Regional Aquatic Effects Monitoring Program (RAEMP) and develop an ecotoxicology assessment program. These programs, along with the groundwater sampling program, will be used to confirm that the Plan is achieving the four environmental management objectives and outcomes specified in the Order. See Chapter 10 for more detail.
<p>Monitoring</p> <ul style="list-style-type: none"> Some consultation participants noted that an independent third-party should be responsible for monitoring the mitigation measures set out in the Plan. 	<p>Phase 1 Phase 3</p>	<ul style="list-style-type: none"> The RAEMP is the foundation for monitoring and evaluating changes in the aquatic environment throughout the Designated Area. The program is being developed with input from the B.C. Ministry of Environment (MOE) and Ktunaxa Nation Council. It will be carried out in accordance with EMA permits. See Chapter 10 for more detail.
<p>Monitoring</p> <ul style="list-style-type: none"> Some participants suggested that Teck monitor levels of selenium in fish tissue samples rather than relying on water-quality measurements, noting that fish tissue measurements would account for water quality, sediment quality and selenium in food that fish eat. Some participants inquired about the use of egg and ovary data as a component in the monitoring and evaluation of effects on fish species. 	<p>Phase 3</p>	<ul style="list-style-type: none"> Monitoring of fish tissue for Order constituents, including selenium, is part of the monitoring program outlined in the Plan. See Chapter 11 for more detail.
<p>Monitoring</p> <ul style="list-style-type: none"> Some participants suggested that the Plan should outline specific timelines for availability of monitoring data and a regular review process so that members of the public and key stakeholders would know when to expect information. Some participants stated that monitoring data should be provided to the BC government and the public at regular intervals. Some participants requested that Teck identify how often it plans to test water quality throughout the Elk Valley. 	<p>Phase 3</p>	<ul style="list-style-type: none"> Summary reports and associated data collected under ecosystem monitoring programs will be provided to the Ministry of Environment (MOE) and the Ktunaxa Nation Council, and made available to the public on the Plan website www.teck.com/elkvalley. See Chapter 11 for more detail.

INPUT	SOURCE	CONSIDERATION OF INPUT
<p>Monitoring</p> <ul style="list-style-type: none"> Some respondents asked about how the concentrations provided in the Phase 3 discussion guide were expressed (e.g., peak daily, average daily, average monthly or average annual), concerned that if averages were used, then peak values would be higher. 	Phase 3	<ul style="list-style-type: none"> Water-quality targets are defined as maximum average monthly concentrations. See Chapter 8 for more detail.
<p>Need for a broader watershed plan</p> <ul style="list-style-type: none"> Some consultation participants noted a need for a watershed plan that would go beyond the scope of the Plan and look at other users of the watershed beyond Teck's operations. <ul style="list-style-type: none"> Some consultation participants said this additional plan should be the responsibility of the provincial government. Several participants suggested that other industries and organizations, such as tourism-related businesses and utilities, should be brought into a water-use plan process. 	Phase 1 Phase 3	<ul style="list-style-type: none"> Outside of the scope of the Plan.
<p>Need for increased healthcare services in the Elk Valley</p> <ul style="list-style-type: none"> Some consultation participants indicated that the Elk Valley requires more healthcare services. 	Phase 1	<ul style="list-style-type: none"> Outside of the scope of the Plan.
<p>Positive effects of mining on other industries</p> <ul style="list-style-type: none"> Some consultation participants discussed the positive impacts that mining has on other industries that supply the mining industry. 	Phase 1	<ul style="list-style-type: none"> The economic contribution of mining was considered as part of the socio-economic analysis conducted as part of the Plan. See Chapter 9 for more detail.
<p>Properties of waste rock</p> <ul style="list-style-type: none"> Some consultation participants asked how long it would take for waste rock piles to no longer release selenium. 	Phase 2	<ul style="list-style-type: none"> Geochemical study suggests waste rock piles continue to release selenium for a very long period of time. For example, monitoring of one site over 20 years has shown no significant decrease in selenium release.
<p>Properties of waste rock</p> <ul style="list-style-type: none"> Some consultation participants asked whether Teck had looked at whether certain type of seams contains more selenium and, if so, whether mining those seams could be avoided. 	Phase 2	<ul style="list-style-type: none"> Coal in the Elk Valley is mined almost exclusively from a single geological formation, with what appears to be relatively uniform regional characteristics.

INPUT	SOURCE	CONSIDERATION OF INPUT
<p>Public access to water-quality monitoring data</p> <ul style="list-style-type: none"> Some consultation participants noted that water-quality monitoring data and reports should be transparent and made available to the public. 	<p>Phase 1 Phase 3</p>	<ul style="list-style-type: none"> Summary reports and associated data collected under ecosystem monitoring programs will be provided to MOE and the Ktunaxa Nation Council, and made available to the public on the Plan website http://www.teck.com/elkvalley.
<p>R&D</p> <ul style="list-style-type: none"> Some consultation participants noted that Teck should continue to invest in R&D to mitigate issues with constituents of concern. 		<ul style="list-style-type: none"> The Plan includes ongoing R&D through which Teck will identify, assess and improve methods to protect water quality. See Chapters 6 and 11 for more detail.
<p>Scope of the Plan</p> <ul style="list-style-type: none"> Some consultation participants sought confirmation that Michel Creek would be included and considered in the development of the Plan. One participant suggested that an order station should be established on Michel Creek before it enters the Elk River. 	<p>Phase 1 Phase 3</p>	<ul style="list-style-type: none"> Teck has proposed a surface water-quality monitoring network associated with Plan approval. This network includes the Order water-quality monitoring locations extending along the Elk River and its major tributaries (the Fording River and Michel Creek) and Lake Koocanusa, as well as relevant reference stations. See Chapter 10 for more detail.
<p>Scope of the Plan</p> <ul style="list-style-type: none"> Some consultation participants requested a water-quality monitoring station be placed at Bayne's Lake. 	<p>Phase 1</p>	<ul style="list-style-type: none"> Water-quality monitoring is planned within the Designated Area. See Chapter 10 for more detail.
<p>Scope of the Plan</p> <ul style="list-style-type: none"> Some consultation participants wanted to know how the Plan would identify priority areas for monitoring and treatment. 	<p>Phase 1</p>	<ul style="list-style-type: none"> Treatment locations are chosen according to current receiving environment concentrations relative to targets and waste rock volume in place. See Chapter 8 for more detail. Teck has proposed a surface water-quality monitoring network associated with Plan approval. This network includes the Order water-quality monitoring locations extending along the Elk River and its major tributaries (the Fording River and Michel Creek) and Lake Koocanusa, as well as relevant reference stations. See Chapter 10 for more detail.
<p>Scope of the Plan</p> <ul style="list-style-type: none"> Some consultation participants noted that people who live on different tributaries and fish and swim in different areas would have different priorities. 	<p>Phase 1</p>	<ul style="list-style-type: none"> Teck recognizes that there is a range of perspectives regarding water quality in the Elk Valley. The socio-economic analysis considers a wide range of factors in evaluating the social and economic impact of the Plan. See Chapter 9 for more detail.

INPUT	SOURCE	CONSIDERATION OF INPUT
<p>Scope of the Plan</p> <ul style="list-style-type: none"> A participant asked whether other contributors to water quality effects, such as municipal sewage, the forestry industry and oil and gas exploration, are considered under the Plan 	<p>Ktunaxa Consultation</p>	<ul style="list-style-type: none"> The Plan will identify and implement solutions to stabilize and reverse the increasing trend of selenium, and will address other substances identified in the Order to ensure the health of the watershed, while at the same time allowing for continued sustainable mining in the Valley.
<p>Short-term approach</p> <ul style="list-style-type: none"> Some consultation participants agreed with and support the proposed short-term approach. 	<p>Phase 2</p>	<ul style="list-style-type: none"> Feedback noted; no response required.
<p>Short-term approach</p> <ul style="list-style-type: none"> Some consultation participants were concerned about the economic feasibility of water treatment as a mitigation measure as part of the short-term approach because of its cost. 	<p>Phase 2</p>	<ul style="list-style-type: none"> The evaluation of treatment technologies considered factors including performance, operability, technology readiness, economics and full-scale footprint.
<p>Short-term approach</p> <ul style="list-style-type: none"> Some consultation participants stated that the short-term approach should include ongoing investment in R&D. 	<p>Phase 2</p>	<ul style="list-style-type: none"> The Plan includes ongoing R&D programs through which Teck will identify, assess and improve methods to protect water quality. See Chapter 6 for more detail.
<p>Short-term approach</p> <ul style="list-style-type: none"> Some consultation participants were concerned that short-term measures are not being implemented quickly enough and that water treatment facilities should be built sooner. 	<p>Phase 2</p>	<ul style="list-style-type: none"> The initial implementation plan has been designed to meet water quality targets that protect aquatic and human health. The proposed implementation of water treatment allows an efficient construction team and some opportunity to learn from previous facilities. Through monitoring of receiving water quality, effects, and what is achieved by the first two treatment facilities, the timing of future facilities may be updated. As R&D measures are incorporated, the reliance on active water treatment may be reduced. See Chapter 8 for more detail.
<p>Short-term approach</p> <ul style="list-style-type: none"> Some consultation participants stated that the short-term approach should include targets and timelines. 	<p>Phase 2</p>	<ul style="list-style-type: none"> Short-term targets have been established based on technical and financial achievability, with time-frames defined by the initial implementation plan. See Chapter 8 for more detail.

INPUT	SOURCE	CONSIDERATION OF INPUT
<p>Socio-economic analysis</p> <ul style="list-style-type: none"> Some consultation participants were supportive of the proposed scope of the socio-economic impact analysis. 	<p>Phase 1 Ktunaxa Consultation</p>	<ul style="list-style-type: none"> See Chapter 9 for more detail on the socio-economic analysis.
<p>Socio-economic analysis</p> <ul style="list-style-type: none"> Some consultation participants were concerned that selenium issues could result in the closure of mining operations. 	<p>Phase 1</p>	<ul style="list-style-type: none"> The purpose of the Plan is to maintain the ongoing health of the watershed, while at the same time allowing for continued sustainable mining in the Elk Valley.
<p>Socio-economic analysis</p> <ul style="list-style-type: none"> Some consultation participants indicated that the socio-economic impact analysis should show the impact that shutting down the mines would have on the local economy. 	<p>Phase 1</p>	<ul style="list-style-type: none"> Teck is the single largest employer in the larger East Kootenay region as a result of its steelmaking coal operations, directly or indirectly contributing 6,440 jobs to the local economy. One-in-five of the 33,000 jobs in the East Kootenay are dependent on Teck's five mining operations and supporting offices and services. See Chapter 1 for more detail.
<p>Socio-economic analysis</p> <ul style="list-style-type: none"> A participant suggested that the fourth step in the Plan development process should focus on the aquatic environment first and look at social and economic factors second. 	<p>Phase 1</p>	<ul style="list-style-type: none"> The proposed targets set out in the Plan were established to maintain the ongoing health of the watershed.
<p>Socio-economic analysis</p> <ul style="list-style-type: none"> One participant stated that providing jobs should not come at the expense of rivers, and that spending money on attempting to address the problem does not justify the jobs either. 	<p>Phase 3</p>	<ul style="list-style-type: none"> The primary objective of the Plan is to maintain the health of the watershed while allowing for continued sustainable mining. Teck is focused on responsible resource development and has implemented a sustainability strategy that focuses on key areas, including water and biodiversity.
<p>Socio-economic analysis</p> <ul style="list-style-type: none"> One participant stated that the socio-economic assessment is an important element of the Plan that was missing from the Phase 3 Discussion Guide. 	<p>Phase 3</p>	<ul style="list-style-type: none"> More detail on the socio-economic assessment can be found in Chapter 9.

INPUT	SOURCE	CONSIDERATION OF INPUT
<p>Support for steps in development of the Plan</p> <ul style="list-style-type: none"> When asked to indicate their level of agreement with the steps to be taken in developing the Plan, 92% of respondents in Phase 1 indicated that they agreed, while 4% disagreed and 3% neither agreed nor disagreed. 	<p>Phase 1 Ktunaxa Consultation</p>	<ul style="list-style-type: none"> Feedback noted; no response required.
<p>Support for steps in development of the Elk Valley Water Quality Plan</p> <ul style="list-style-type: none"> Additional comments provided during Phase 1 also showed support for the steps outlined for the development of the Plan, with some respondents expressing confidence in Teck's role in monitoring and improving water quality. 	<p>Phase 1</p>	<ul style="list-style-type: none"> Feedback noted; no response required.
<p>Support for steps in development of the Elk Valley Water Quality Plan</p> <ul style="list-style-type: none"> Participants expressed their appreciation for Teck's efforts in sharing information about the Plan and for seeking community feedback. 	<p>Phase 1</p>	<ul style="list-style-type: none"> Feedback noted; no response required.
<p>Support for Teck's efforts to develop the Plan</p> <ul style="list-style-type: none"> Some consultation participants expressed appreciation for Teck's efforts in developing the Plan to protect water quality while ensuring economic development can continue. 	<p>Phase 1 Phase 2 Phase 3</p>	<ul style="list-style-type: none"> Feedback noted; no response required.
<p>Support for Teck's efforts to protect water quality</p> <ul style="list-style-type: none"> Several participants acknowledged that Teck has taken a leadership role in water-quality protection. 	<p>Phase 1 Phase 3</p>	<ul style="list-style-type: none"> Feedback noted; no response required.
<p>Support for Teck's efforts to protect water quality</p> <ul style="list-style-type: none"> Some participants stated that Teck is a good community partner. 	<p>Phase 1 Phase 2 Phase 3</p>	<ul style="list-style-type: none"> Feedback noted; no response required.
<p>Support for Teck efforts to protect water quality</p> <ul style="list-style-type: none"> Some consultation participants noted that Teck and its mining activities provide good-paying jobs and support community services in the Elk Valley. 	<p>Phase 1 Phase 3</p>	<ul style="list-style-type: none"> Feedback noted; no response required.

INPUT	SOURCE	CONSIDERATION OF INPUT
<p>Support for the draft Plan content as outlined in the Phase 3 Discussion Guide</p> <ul style="list-style-type: none"> Some participants were in agreement with the Plan and water-quality targets as outlined in the Phase 3 Discussion Guide. 	Phase 3	<ul style="list-style-type: none"> Feedback noted; no response required.
<p>Technical Advisory Committee (TAC)</p> <ul style="list-style-type: none"> A participant expressed a concern that members of the public had not been invited to observe the TAC meetings. 	Phase 1	<ul style="list-style-type: none"> The Plan was informed by scientific advice from the nine-member TAC, which included representatives of the provincial and federal governments, Ktunaxa Nation Council, US federal government, Montana state government, an independent third-party qualified scientist, and Teck. Meeting notes were posted publically at www.elkvalleytac.com/ and all advice was collected in Annex A of the Plan. See Chapter 3 for more detail.
<p>Technical Advisory Committee (TAC)</p> <ul style="list-style-type: none"> Some participants asked about the Technical Advisory Committee process, specifically how data will be assessed and store, and whether it will be public. 	Ktunaxa Consultation	<ul style="list-style-type: none"> The Plan was informed by scientific advice from the nine-member TAC, which included representatives of the provincial and federal governments, Ktunaxa Nation Council, US federal government, Montana state government, an independent third-party qualified scientist, and Teck. Meeting notes were posted publically at www.elkvalleytac.com/ and all advice was collected in Annex A of the Plan. See Chapter 3 for more detail.
<p>Traditional Use</p> <ul style="list-style-type: none"> Some participants expressed the importance of water to Ktunaxa traditional and spiritual use 	Ktunaxa Consultation	<ul style="list-style-type: none"> Teck respects the traditional and spiritual importance of water to the Ktunaxa Nation. The socio-economic analysis considers a wide range of factors in evaluating the social and economic impact of the Plan. See Chapter 9 for more detail.
<p>Transportation of Coal</p> <ul style="list-style-type: none"> Some participants asked whether the transport of coal impacted water quality 	Ktunaxa Consultation	<ul style="list-style-type: none"> The release of selenium, cadmium, nitrate and sulphate and calcite formation originates in waste rock piles associated with mining, rather than the steelmaking coal product itself.

INPUT	SOURCE	CONSIDERATION OF INPUT
<p>Technical Advisory Committee (TAC)</p> <ul style="list-style-type: none"> A participant asked why health authorities were not represented on the TAC. 	Phase 1	<ul style="list-style-type: none"> The Interior Health Authority was invited by B.C. Ministry of Environment to participate in the TAC process and contributed to the TAC human health working group.
<p>Use of waste-rock covers</p> <ul style="list-style-type: none"> Some consultation participants were concerned that waste-rock covers may not work or would have unintended environmental impacts as they degrade. Some consultation participants were supportive of the use of waste-rock covers as a potential mitigation measure. Some participants asked about the use of waste-rock covers, including whether they was mandatory in Alberta and whether top-soil covers in Alberta were being used to manage selenium issues. 	Phase 1 Phase 3	<ul style="list-style-type: none"> Teck's R&D program is evaluating a wide range of waste-rock covers or surface treatment. The scale at which covers would be needed is an economic challenge, and it is not yet clear whether they will prove feasible. See Chapter 6 for more detail.
<p>Water diversions</p> <ul style="list-style-type: none"> Some consultation participants suggested the use of diversions to keep clean water clean. Some consultant participants were interested in learning more about water management measures, including whether diversions that Teck had built previously were currently in operation and how pumping and storing of freshet water would work. Some participants expressed concern that diversions Teck constructed previously did not work. 	Phase 1	<ul style="list-style-type: none"> Clean-water diversions, along with active water treatment, have been identified as the most effective options to stabilize water-quality concentrations in the short term. Clean-water diversions reduce volumes of water impacted by waste rock, reducing the amount of water that needs to be treated. See Chapter 6 for more detail.
<p>Water-quality guidelines</p> <ul style="list-style-type: none"> Some consultation participants asked why the existing B.C., Canadian and U.S. WQGs for selenium are different. 	Phase 2	<ul style="list-style-type: none"> Outside of the scope of the Plan.
<p>Water quality guidelines</p> <ul style="list-style-type: none"> Some participants asked whether Teck had or was lobbying to raise the B.C. WQGs. 	Phase 3	<ul style="list-style-type: none"> Teck is not lobbying government regarding B.C. WQGs.

INPUT	SOURCE	CONSIDERATION OF INPUT
<p>Water-quality targets</p> <ul style="list-style-type: none"> Some consultation participants were interested in additional information and additional detail regarding water quality targets, including the units they would be measured in 	Phase 1	<ul style="list-style-type: none"> Detail on the short-, medium- and long-term water-quality targets for selenium, cadmium, nitrate and sulphate is available in Chapter 8. Water quality is measured in units of milligrams per litre or parts per million for nitrate and sulphate and in units of micrograms per litre or parts per billion for selenium and cadmium.
<p>Water-quality targets</p> <ul style="list-style-type: none"> Some consultation participants stated that it was critical to identify target levels for receiving waters and discharge waters. 	Phase 1	<ul style="list-style-type: none"> As outlined in the Order, long-term concentration targets were established for the following monitoring locations: <ul style="list-style-type: none"> Fording River downstream of Greenhills Creek (FR4) Fording River at the mouth (FR5) Elk River downstream of Greenhills Operations (ER1) Elk River downstream of the Fording River (ER2) Elk River downstream of Michel Creek (ER3) Elk River at Elko Reservoir (ER4) Lake Koochanusa, south of the mouth of the Elk River (LK2)
<p>Water quality targets</p> <ul style="list-style-type: none"> A participant suggested that new targets should not be developed and that the federal and provincial drinking water guidelines should be used as the targets for the Plan. 	Phase 1 Phase 3	<ul style="list-style-type: none"> The BC MOE WQGs for aquatic health, or their equivalent, have been set as the long-term water-quality targets for sulphate and cadmium at most order stations in the Elk Valley. Where the long-term targets are not able to meet the WQGs, site-specific targets have been set, including targets for selenium and nitrate in the Fording River and selenium in the Elk River. See Chapter 8 for more detail.
<p>Water quality targets</p> <ul style="list-style-type: none"> Some consultation participants sought clarity about what targets would be included in the Plan. 	Phase 1	<ul style="list-style-type: none"> See Chapter 8 for more detail.
<p>Water quality targets</p> <ul style="list-style-type: none"> Some consultation participants were interested to know how B.C. WQGs for drinking water would be factored into the water-quality targets. 	Phase 1	<ul style="list-style-type: none"> WQGs for drinking and results of the human health assessment of current (2013) conditions were also considered for development of long-term selenium targets in the Elk River. See Chapter 5 for more detail.

INPUT	SOURCE	CONSIDERATION OF INPUT
<p>Water quality targets</p> <ul style="list-style-type: none"> Some participants asked why the targets outlined in the Phase 3 Discussion Guide are seemingly higher than where Teck expects selenium levels to be and whether the targets could or should be set lower. 	Phase 3	<ul style="list-style-type: none"> Long-term targets were developed to be protective of aquatic and human health. The adaptive management framework will be used to confirm that the objectives of the Plan are being met and to adjust and improve management actions as required. See Chapters 8 and 11 for more detail.
<p>Water-quality targets</p> <ul style="list-style-type: none"> Some participants were hopeful that Teck would achieve the targets stated in the Phase 3 Discussion Guide within the stated timeframes. 	Phase 3	<ul style="list-style-type: none"> Feedback noted; no response required.
<p>Water treatment facilities</p> <ul style="list-style-type: none"> Some consultation participants sought clarification about how much selenium would be removed from the Elk Valley watershed through the Line Creek Water Treatment Facility. 	Phase 1	<ul style="list-style-type: none"> The West Line Creek Water Treatment facility will remove about 1.8 kilograms of selenium per day. See Chapter 6 for more detail.
<p>Water treatment facilities</p> <ul style="list-style-type: none"> Some consultation participants were interested in the process used to removed nitrates and selenium from water at the Line Creek Water Treatment Facility. 	Phase 1	<ul style="list-style-type: none"> Fluidized bed reactor treatment (a type of biological treatment) was selected for full-scale implementation at Line Creek Operations. See Chapter 6 for more detail.
<p>Water treatment facilities</p> <ul style="list-style-type: none"> Some participants were concerned about substances that were added during the water treatment process, such as phosphorus and aluminum. Some participants sought assurances that substances added to the water would not result in other impacts to the health of the watershed. Participants sought detailed information about the substances added in the water treatment process. Some participants were concerned about the potential detrimental and unforeseen effects of water treatment on water quality. 	Phase 1	<ul style="list-style-type: none"> At this time, current biological treatment processes require the addition of phosphorous for the removal of nitrate and selenium. Phosphorus does not currently exceed WGGs within the Elk Valley. In recognition that the Elk Valley is phosphorous-limited, an evaluation of potential changes in trophic status within the Fording and Elk Rivers, and in Lake Koocanusa was performed. Aluminum is used in the treatment process to assist settling out the selenium particulate. The use of aluminum was fully assessed through the permitting process to ensure protection of the environment.

INPUT	SOURCE	CONSIDERATION OF INPUT
<p>Water treatment facilities</p> <ul style="list-style-type: none"> Some participants asked about lined storage facilities at the sites that would be used to stockpile selenium removed from treated water. Participants sought assurances that safeguards would be in place to ensure that selenium would not leak out of the storage facilities and that there would be enough capacity to store selenium removed from water over time. 	<p>Phase 1 Phase 3</p>	<ul style="list-style-type: none"> Teck's current approach to residuals management is to de-water to a solids content of ~20%, at which point they have the consistency of a wet soil, and store these residuals in lined containment cells on site. When filled, these storage cells will be capped and covered for long-term storage.
<p>Water treatment facilities</p> <ul style="list-style-type: none"> Some consultation participants stated that Teck should not rely on water treatment facilities. Some participants inquired whether future water treatment plants would use the same processes as the West Line Creek Water Treatment Facility. 	<p>Phase 1 Phase 2 Phase 3 Ktunaxa Consultation</p>	<ul style="list-style-type: none"> New technologies and water-quality management techniques being developed through R&D have the potential to reduce the reliance on active water treatment in the long term. Teck's R&D program is focused on improving the effectiveness of water treatment technologies and clean-water diversions while investigating long-term solutions that are focused on managing water at source, such as waste-rock covers and saturated fills. See Chapter 6 for more detail.
<p>Water treatment facilities</p> <ul style="list-style-type: none"> One participant was concerned that the construction of water treatment facilities would affect access to waterways for recreation activities and asked whether Teck has a plan to mitigate these effects. 	<p>Phase 3</p>	<ul style="list-style-type: none"> Water treatment facilities will be sited within existing mining lands already closed to public access and so they will not affect access related to recreation.