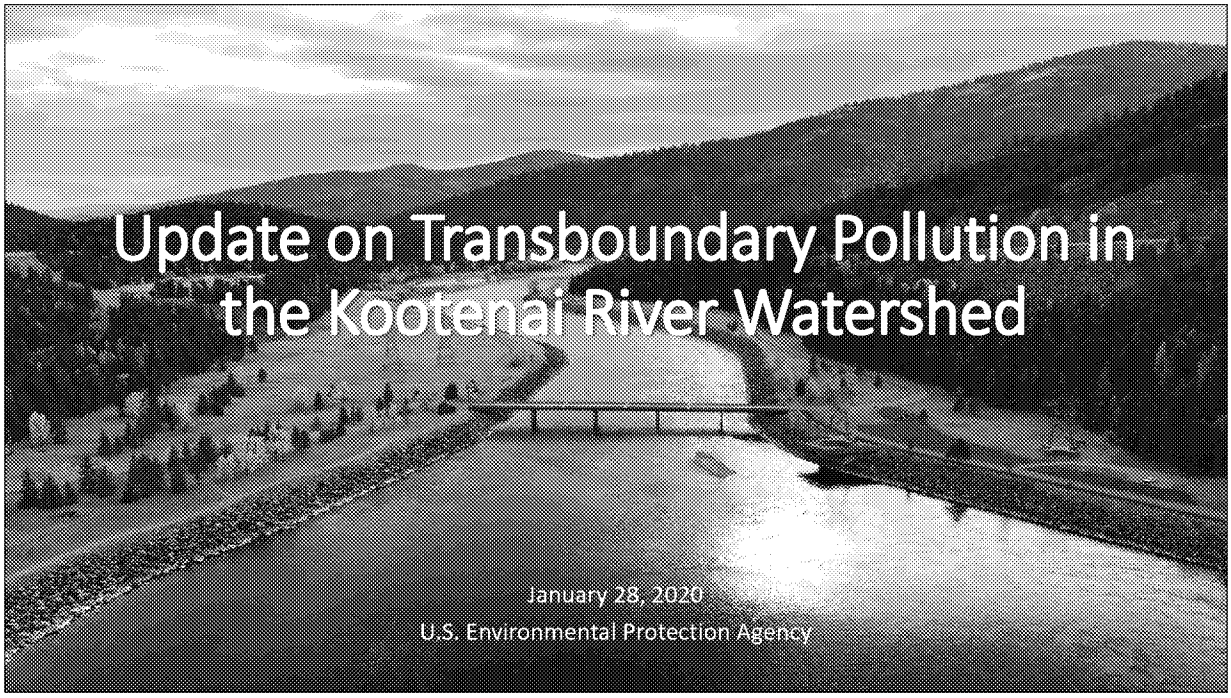


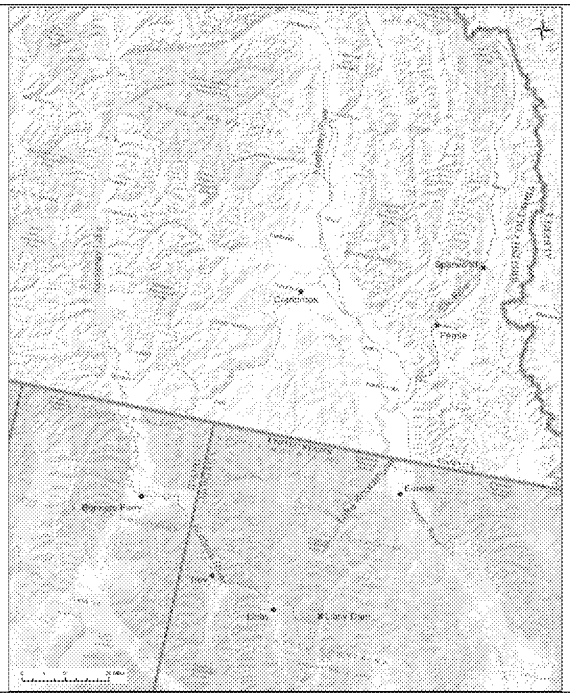
Update on Transboundary Pollution in the Kootenai River Watershed

January 28, 2020

U.S. Environmental Protection Agency

Agenda/Updates

- Geographic Setting
- Selenium Criterion
- Implementation Plan Adjustment (IPA)
- Saturated Rock Fills (SRFs)
- Environmental Monitoring Committee (EMC)
- Kootenai River Water Quality Study
- Monitoring Coordination and Gaps Analysis
- USGS Transboundary Monitoring Appropriations
- Remaining Challenges



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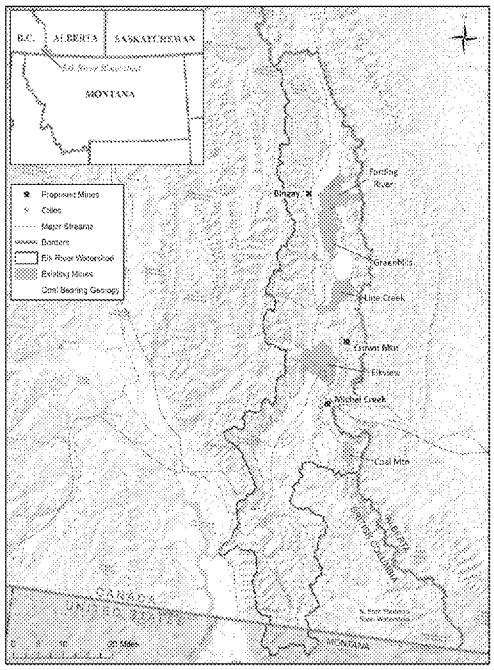
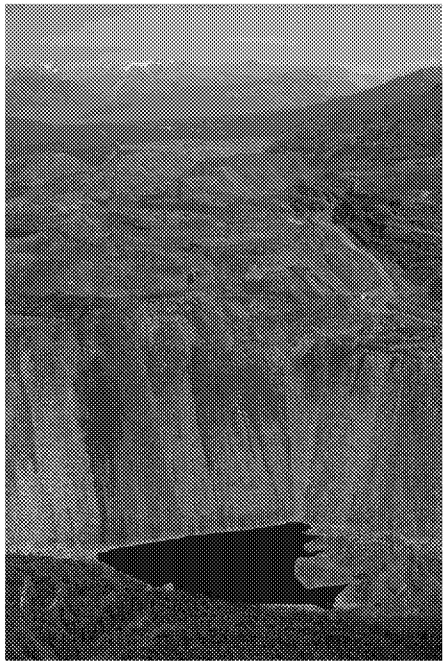

B.C.
ALBERTA
SASKATCHEWAN
MONTANA
Proposed Mines
Cities
Major Streams
Borders
Elk River Watershed
Existing Mines
Coal Bearing Geology
Fording River
Bingay
GreenMtn
Line Creek
Crown Mtn
Elkview
Michel Creek
Coal Mtn
ALBERTA
BRITISH COLUMBIA
CANADA
UNITED STATES
MONTANA
0 5 10 20 Miles



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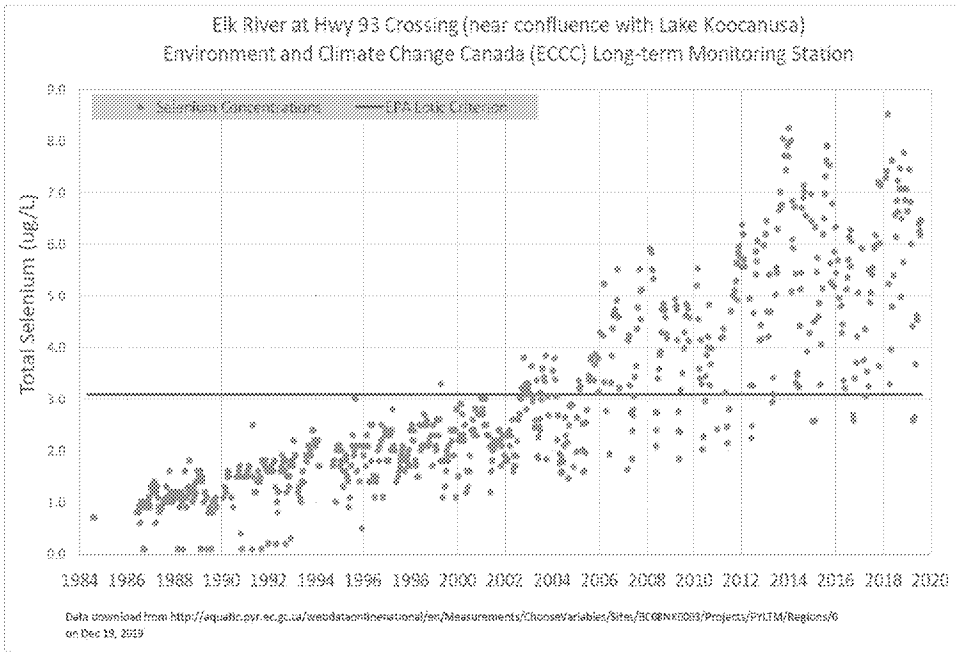
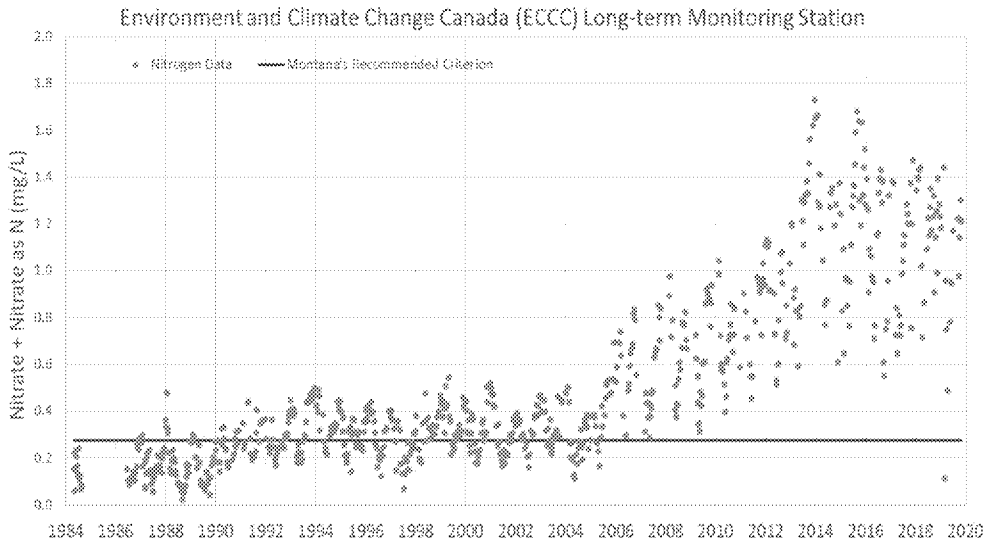
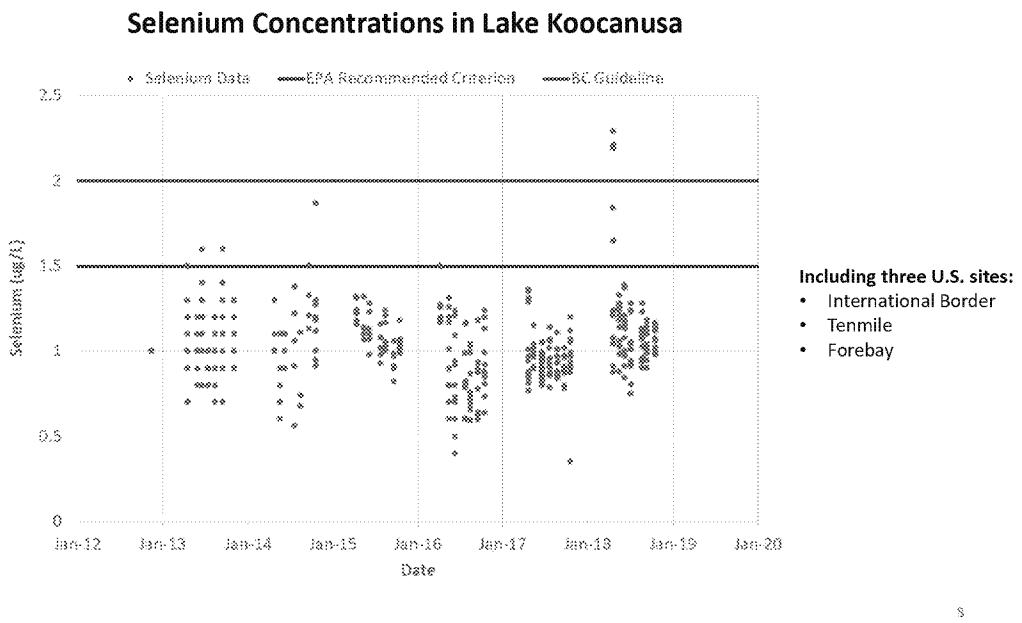

Elk River at Hwy 93 Crossing (near confluence with Lake Koocanusa)
Environment and Climate Change Canada (ECCC) Long-term Monitoring Station
Selenium Concentrations
EPA Lotic Criterion
Total Selenium (ug/L)
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020
Data download from http://aquatic.pyr.ec.gc.ca/webdataonlinenational/en/Measurements/ChooseVariables/Sites/BC08NK0003/Projects/PYLTM/Regions/6
on Dec 19, 2019

6



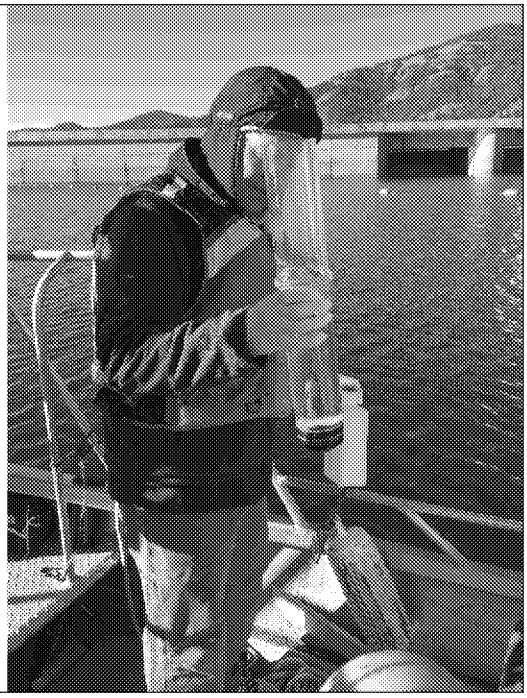
Data download from http://aquatic.pyr.ec.gc.ca/webdataonlinenational/en/Measurements/ChooseVariables/Sites/BC08NK0003/Projects/PYLTM/Regions/9
on Dec 19, 2019

7


Selenium Concentrations in Lake Koocanusa
Selenium Data
EPA Recommended Criterion
BC Guideline
Selenium (ug/L)
2.5
2
1.5
1
0.5
0
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Date
Including three U.S. sites:
International Border
Tenmile
Forebay

What's Being Done?

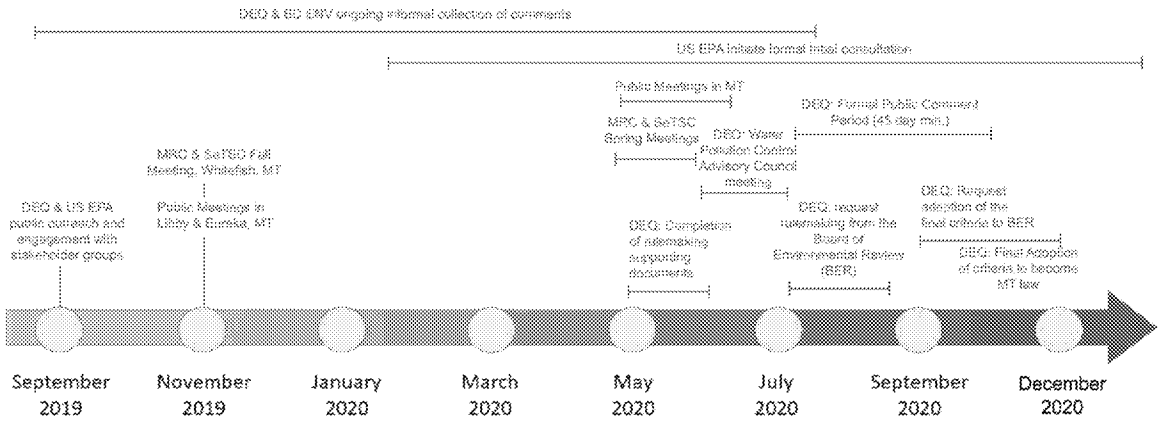
- Extensive monitoring in Lake Koocanusa
- Site specific selenium criterion development for Lake Koocanusa
- Kootenai River monitoring
- MOU between B.C. and Montana
  - Technical committees
    - Monitoring and Research Committee (MRC)
    - Selenium Technical Subcommittee
  - Provides for information sharing/website/etc.
- Public outreach
- Tribal Engagement
- Participating in working groups reviewing new mine proposals



DRAFT- Tentative Timeline

DEQ Montana Department of Environmental Quality

Development of a selenium site-specific criterion for Lake Koocanusa



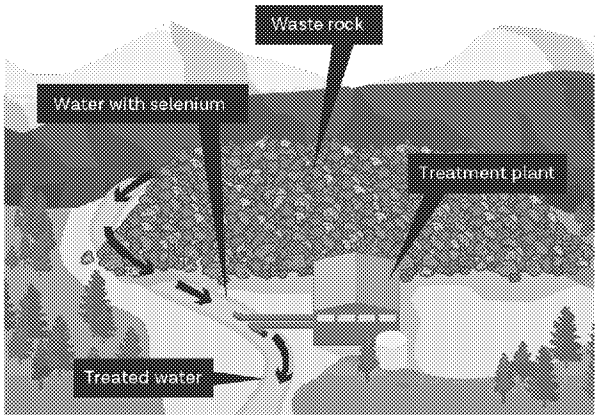
Implementation Plan Adjustment

- Elk Valley Water Quality Plan (EVWQP)
  - Developed in 2014
  - Sets WQ targets for multiple sites throughout the Elk River Valley and Lake Koocanusa
  - Provides the implementation plan to meet those targets
    - Focused on active water treatment
  - Must be updated every five years
- 2019 Implementation Plan Adjustment (IPA) released Nov 14, 2019
  - Predicted significantly more pollutant loading
  - As a result, 55% more treatment is needed
  - Proposed 16 treatment plants (9 plants proposed in 2014)
  - Due to treatment plant construction delays, predicts targets will be exceeded in Lake Koocanusa until 2023
  - https://www.teck.com/media/Elk-Valley-Water-Quality-Plan%E2%80%932019-Implementation-Plan-Adjustment.pdf
- Significant change in direction communicated at LKMRWG meetings

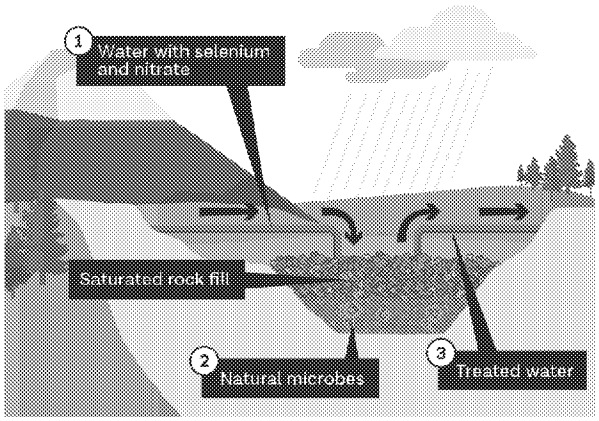
Saturated Rock Fills (SRFs)

- **SRFs:** New proposed treatment technology for the Elk River valley
- In-situ treatment of pollutants
- Uses a combination of natural processes and added materials in mine pits to remove pollutants from water
- Pollutants stay in the pit vs removal from treated water in active water treatment
- First pilot study is complete at Elkview Operations
- ENV has "endorsed" this treatment, and Teck states that ALL future treatment will be SRFs (contradictory to Nov 2019 IPA)
  - **2019 Q3 Financial Report:** *"Our current plan is that the Fording River AWTF [Active Water Treatment Facility] will be the last full-scale AWTF and that future treatment facilities will be SRFs [Saturated Rock Fills]."*
- EPA will be requesting technical information to conduct independent U.S. expert review of SRF – no design/performance details have been provided to date
- Ktunaxa Nation Council is currently conducting an independent review

Active Water Treatment



Saturated Rock Fill Treatment



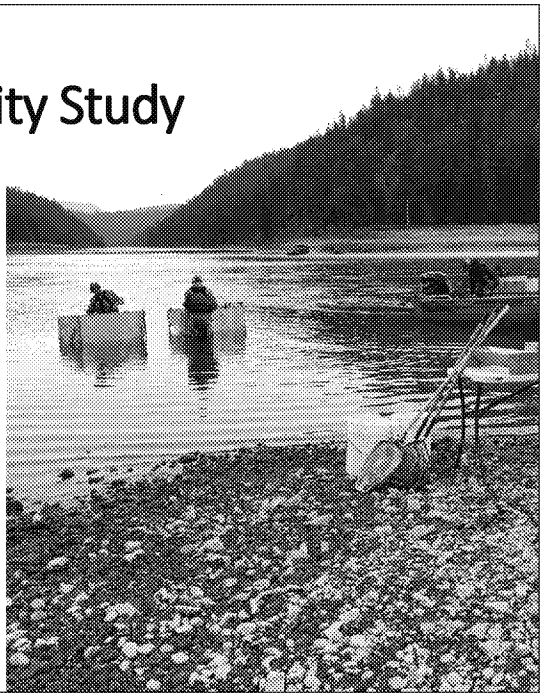
Source: Teck Resources Ltd.
https://www.teck.com/responsibility/sustainability-topics/water/water-quality-in-the-elk-valley/

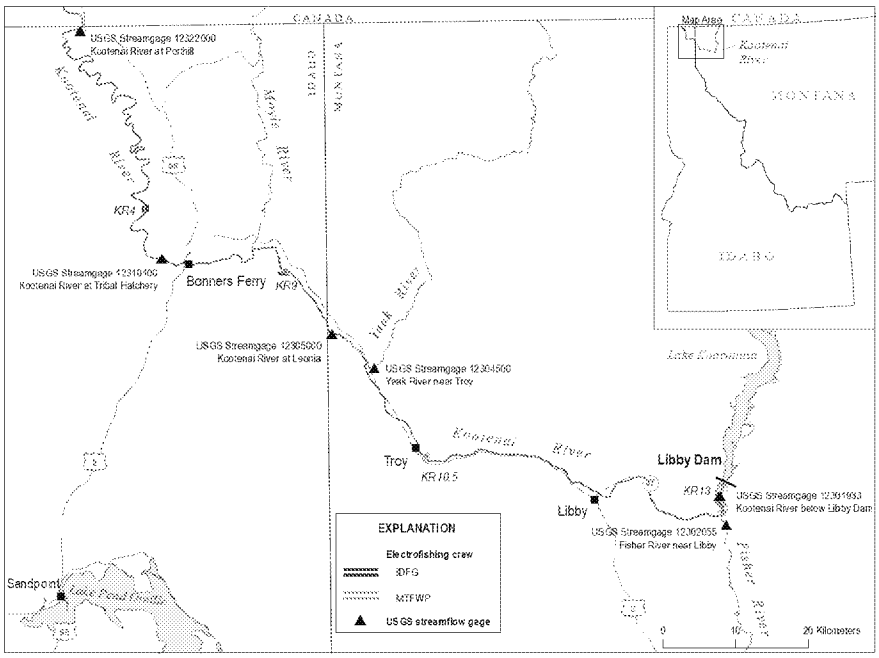
Environmental Monitoring Committee (EMC)

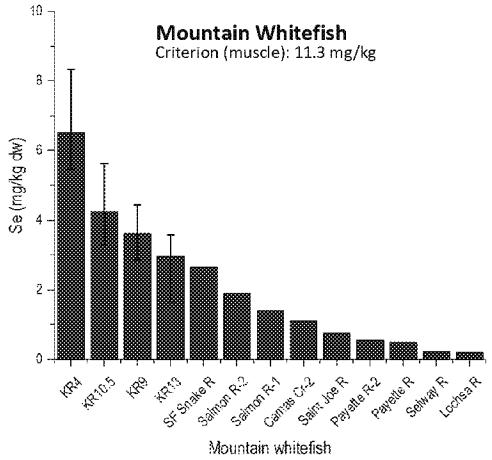
- Committee oversees compliance monitoring for Teck's valley-wide permit, including monitoring in Lake Koocanusa
- Note: U.S. stakeholders are not included on the committee
- 2019 report found:
  - *"Very concerning decrease in juvenile and adult Westslope Cutthroat Trout density estimates compared to 2017" (Fording River)*
  - *"The average concentrations of selenium in the ovaries of fish collected from the reservoir were frequently above the BC guideline of 11 mg/kg dw, particularly in Peamouth Chub, Northern Pikeminnow, and Redside Shiner."*
  - *https://www.teck.com/responsibility/sustainability-topics/water/water-quality-in-the-elk-valley/research-and-monitoring-reports/*

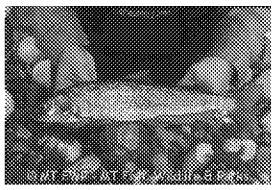
Kootenai River Water Quality Study

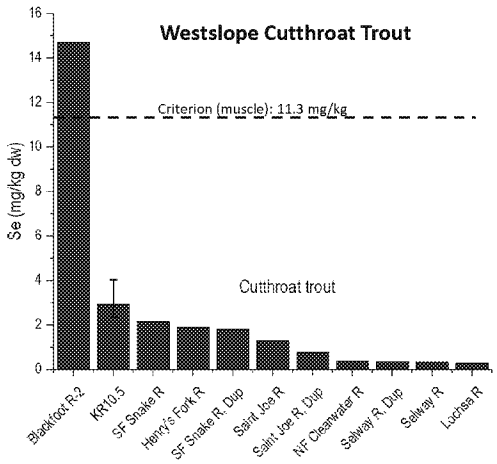
- EPA and USGS study to look for mining impacts in the Kootenai River downstream of Libby Dam
- Study was requested by Tribes and local stakeholders
- Completed in fall 2018 and spring 2019

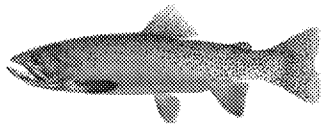


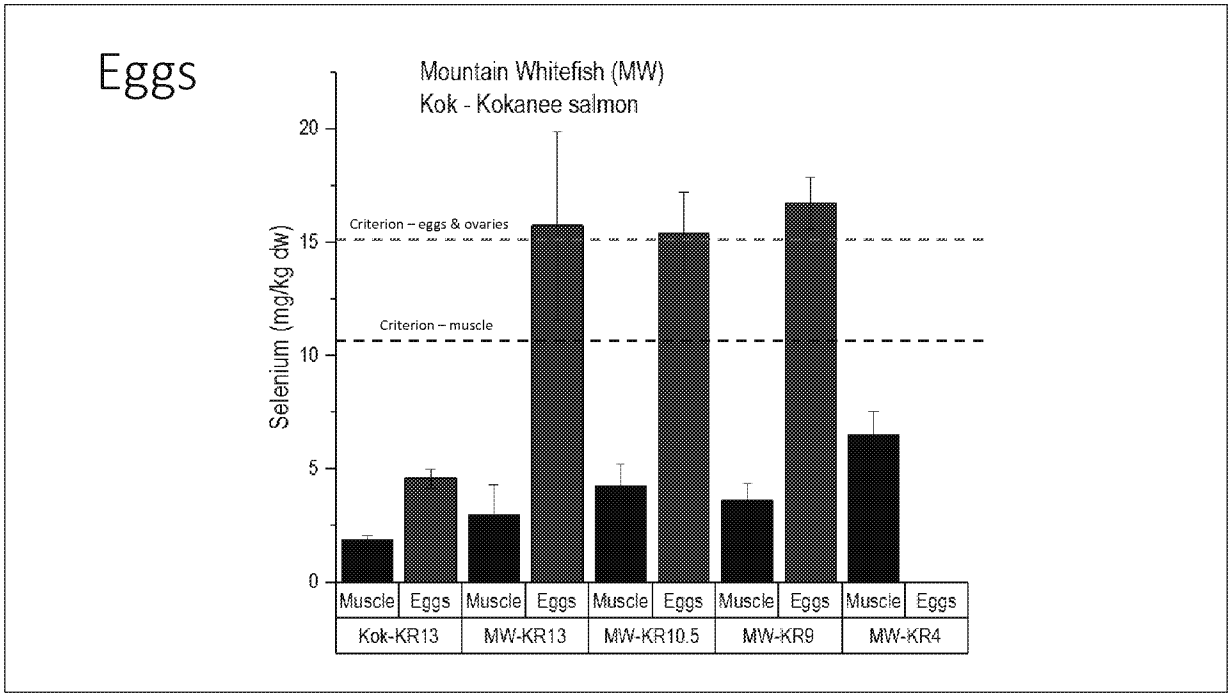

CANADA
USGS Streamgage 12322000
Kootenai River at Porthill
Kootenai
River
Moyie
River
IDAHO
MONTANA
KR4
USGS Streamgage 12310400
Kootenai River at Tribal Hatchery
Bonners Ferry
KR9
Trick
River
USGS Streamgage 12305000
Kootenai River at Leonia
USGS Streamgage 12304500
Yaak River near Troy
Lake Koocanusa
Kootenai
River
Troy
KR18.5
Libby Dam
KR13
USGS Streamgage 12301933
Kootenai River below Libby Dam
Libby
USGS Streamgage 12302055
Fisher River near Libby
Fisher
River
Sandpoint
Lake Pend Oreille
EXPLANATION
Electrofishing crew
IDFG
MTFWP
USGS streamflow gage
0
13
26 Kilometers
Map Area
Kootenai
River
MONTANA
IDAHO


Mountain Whitefish
Criterion (muscle): 11.3 mg/kg
Se (mg/kg dw)
0
2
4
6
8
10
KR4
KR10.5
KR9
KR13
SF Snake R
Salmon R-2
Salmon R-1
Camas Cr-2
Saint Joe R
Payette R-2
Payette R
Selway R
Lochsa R
Mountain whitefish



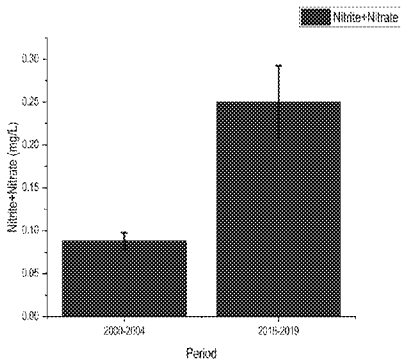

Westslope Cutthroat Trout
Criterion (muscle): 11.3 mg/kg
Se (mg/kg dw)
0
2
4
6
8
10
12
14
16
Cutthroat trout
Blackfoot R-2
KR10.5
SF Snake R
Henry's Fork R
SF Snake R, Dup
Saint Joe R
Saint Joe R, Dup
NF Clearwater R
Selway R, Dup
Selway R
Lochsa R




Eggs
Mountain Whitefish (MW)
Kok - Kokanee salmon
Selenium (mg/kg dw)
20
15
10
5
0
Criterion – eggs & ovaries
Criterion – muscle
Muscle
Eggs
Muscle
Eggs
Muscle
Eggs
Muscle
Eggs
Muscle
Eggs
Kok-KR13
MW-KR13
MW-KR10.5
MW-KR9
MW-KR4

Kootenai River Study Key Findings

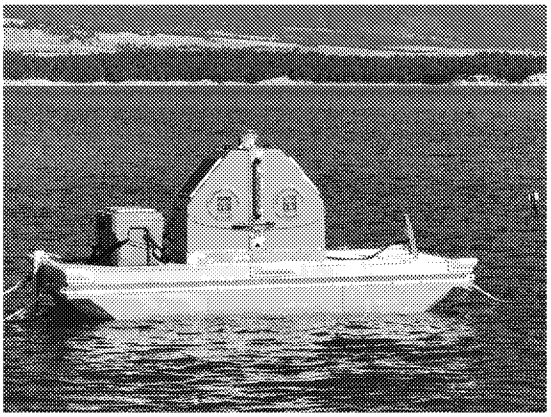
- Nitrogen and selenium concentrations in the Kootenai River are higher than other nearby streams and similar to concentrations in Lake Koocanusa
- Nitrate has increased over time
- Selenium in fish tissue is higher than nearby streams, and elevated throughout the Kootenai River (Libby Dam to Canadian border)
- Selenium in some mountain whitefish tissue exceeds EPA recommended criteria



Kootenai River at Libby Dam

USGS Transboundary Appropriations

- Appropriation in 2019 and 2020 for B.C.-U.S. transboundary monitoring
- 2019 Appropriation ($1.5 million): Automatic samplers installed in Lake Koocanusa (border station) and downstream of Libby Dam
- 2020 Appropriation ($3.0 million): Working on funding plans now



Monitoring Coordination and Gaps Analysis

- Federal partners are developing a Kootenai watershed gaps analysis and monitoring strategy
- Monitoring strategy to encompass multipurpose needs such as:
  - Impacts assessment across the U.S. portion of Kootenai watershed
  - Trends monitoring
  - Baseline monitoring
  - Criteria development and refinement

Remaining Challenges

- Selenium trends continue to increase at the mouth of the Elk River; water quality and fish are being affected 150 miles downstream of the mines in MT and ID
- Transparency – U.S. Stakeholders are neither included nor informed of decision-making processes, permitting updates, etc.
- MOU not signed – no formal mechanism/agreement with U.S. Stakeholders
- Lack of inclusion of U.S. Tribes
- Lake Koocanusa Monitoring and Research Work Group only addresses selenium and only in the reservoir
- Lack of funding for ongoing monitoring needs in the U.S.