Upper Columbia River Site RI/FS

Draft Human Health Risk Assessment

Public Webinars:
June 10, 2020 & July 15, 2020

Speakers

Robert Tan

Remedial Project Manager

U.S. EPA – Region 10

Marc Stifelman

Toxicologist

U.S. EPA – Region 10

Topics

Background

- Upper Columbia River (UCR)/Lake Roosevelt Site
- Remedial Investigation & Feasibility Study (RI/FS) process

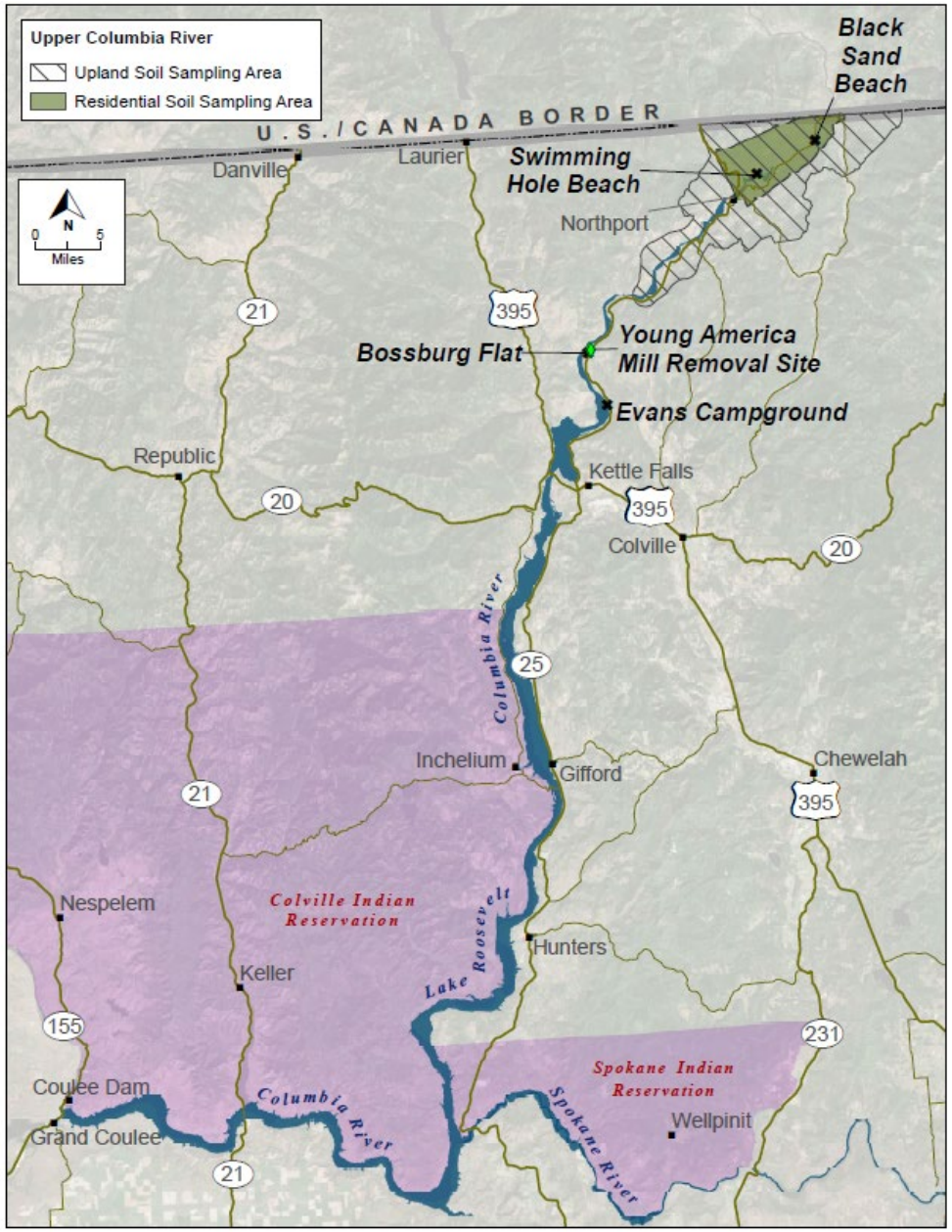
Human Health Risk Assessment

- Overview of process
- Key findings

HHRA Public Feedback and Review process

Site Location

- The Upper Columbia River Site extends from the Canadian border downriver to the Grand Coulee Dam (150 miles)
- Upland areas down to China Bend were also investigated (diagonal hashes)

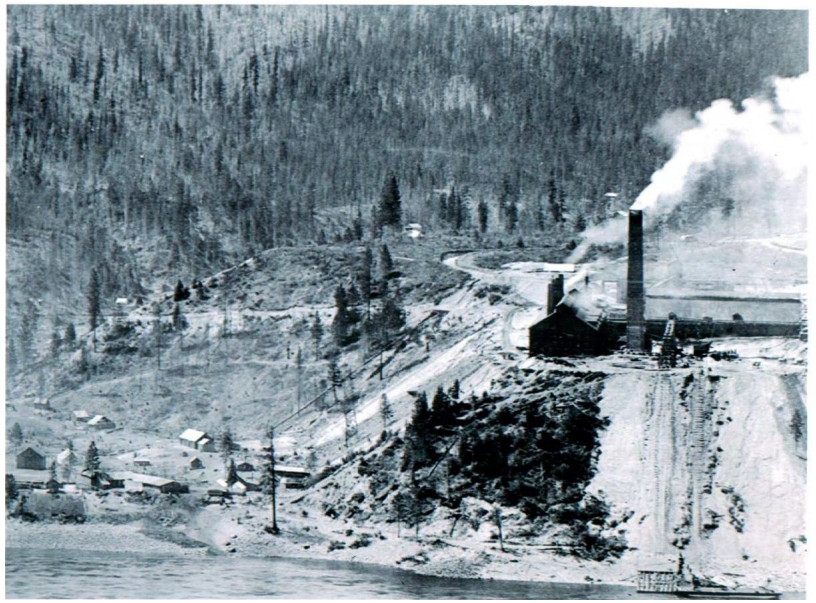


Sources of contamination

Trail Smelter in operation since 1896

Historic operations:

- Smelting copper and gold, then lead, zinc, and other metals
- Discharged slag and liquid effluents into the Columbia River in B.C. from 1930-1995



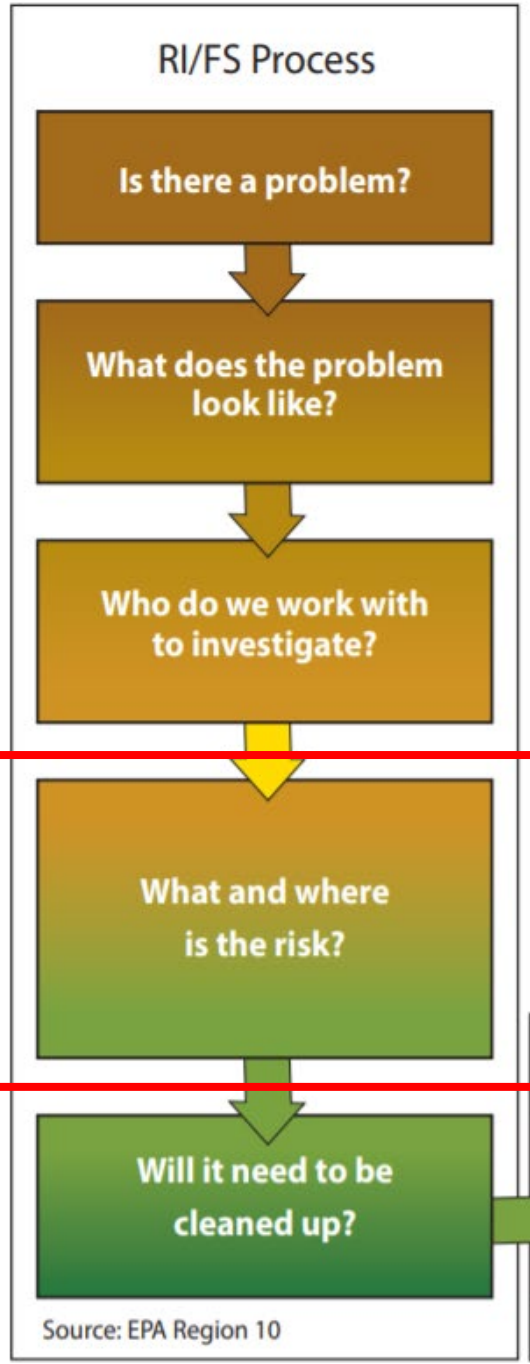
Current operations:

- Owned and operated by Teck Metals Ltd.
- Zinc and lead, secondary smelting for production of a variety of metal products, arsenic products, ammonium sulfate fertilizers, sulfuric acid, and liquid sulfur dioxide

Le Roi/Northport Smelter operated from 1897-1906 and 1916-1921 – copper and lead

Other mines and mills, smelters, pulp and paper facilities, agricultural and municipal watershed

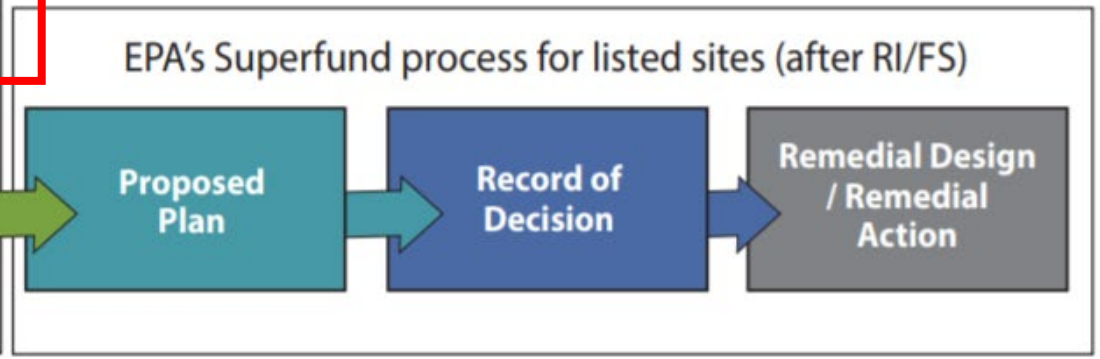
EPA's Upper Columbia River RI/FS



RI/FS: Remedial Investigation / Feasibility Study

- The Remedial Investigation (RI) is a detailed study of the site to identify the nature and extent of pollution.
- The Feasibility Study (FS) is a description and analysis of potential cleanup alternatives for a site, including no-action.

We are here:



Risk Assessment in the Remedial Investigation

Baseline Ecological Risk Assessment

Human Health Risk Assessment

Remedial Investigation

Studies to better understand risk to people

- Public Beach Sediment sampling
- Surface Water sampling
- Colville Tribal Survey
- Recreational Use Survey
- Upland Soil Sampling
- Residential Soil and Beach Reconnaissance and Sampling
- Fish, mussels, crayfish, and plants sampling
- Soil Amendment Technology Evaluation Study (SATES) Ongoing

Actions

- **Beaches**
  - Black Sand Beach removal action: 2010
  - Bossburg Beach closure: 2012
- **Fish consumption advisories** (WA Department of Health)
  - Updated UCR fish consumption advisories: 2012
- **Residential Soils Removal Actions**
  - 2015 (14 properties)
  - 2017-18 (4 properties)
- Northport Removals
  - 2005
  - 2020-2021

What is a Human Health Risk Assessment (HHRA)?

- Risk assessment estimates the possibility of harm to people
  - Lead (Pb)
  - Cancer
  - Non-cancer
- Uses data collected from the site + modeling + data from scientific literature
- Informs risk management and decision-making

Exposure Pathways

The HHRA evaluates people's exposure to chemicals from:

- Incidentally ingesting soil, sediment, and surface water
- Eating fish, plants, or animals;
- Breathing air; and
- Touching soil, sediment, or surface water

Exposure Groups

The HHRA estimates potential risk (the chance of adverse effects) to these groups:

- **Residents**
- **Outdoor workers** (shorter duration, more direct contact with sediment and soils)
- **Recreational visitors**
- **Tribal populations** (evaluated in separate appendices)
    - Confederated Tribes of the Colville Reservation
    - Spokane Tribe of Indians.

Chemicals of Potential Concern

- HHRA evaluated 26+ contaminants/families of chemicals
- Results are broken out by lead and non-lead COPCs, for cancer and other adverse health effects

Lead

- Risk is assessed based on a range of estimated blood lead concentrations.
- EPA uses software to predict blood lead concentrations in children and adults.
- Lead is widespread in the environment, so lead risk is based on exposure from all sources (not just site-related sources).

Chemicals Other than Lead

- Based on estimates of exposure concentrations or chemical intakes, which are compared to toxicity values that are associated with cancer or non-cancer effects.

Risk Benchmarks

Risks are estimated and compared to health-based benchmarks to help determine if actions are needed to protect public health.

For UCR, three types of benchmarks were used:

- Lead Risk Benchmarks
- Non-Lead Cancer Risk
- Non-Lead, Non-Cancer Risk

Lead Benchmarks

EPA uses models to estimate corresponding residential soil lead concentrations for each of these risk benchmarks:

Blood Lead Benchmark	Corresponding soil concentration
3 µg/dL = "**Low**" benchmark	~50 ppm lead in soil
5 µg/dL = "**Mid**" benchmark	~200 ppm lead in soil
8 µg/dL = "**High**" benchmark	~400 ppm lead in soil

Results Summary

Receptor Population	Sub-Group	Lead Benchmark	Non-Cancer Results	Cancer Results
Residents	Current resident without a private beach	"High"	X	✓
	Current resident with a private beach	"Mid"	X	✓
	Potential future resident	"High"	X	✓
Recreational Visitors	Recreational visitor to public beaches (sediment)	"Mid"	X	✓
	Recreational visitor to public beaches (soil)	"High"	X	✓
	Recreational visitor to relict floodplains	"Low"	X	✓
Outdoor Workers	Outdoor worker	"Low"	✓	✓

Key X exceeded at least one benchmark

✓ no benchmark exceeded

Key Results from the HHRA

- Fish
- Beaches, Sediment & Surface Water
- Air
- Upland soils

Fish

- Fish have low lead levels, except for largescale suckers
- Fish consumption is a concern for:
  - methylmercury (developmental, nervous system effects)
  - dioxins and dioxin-like PCBs* (reproductive system effects)
- Follow the Dept of Health Fish Advisory: https://www.doh.wa.gov/Portals/1/Documents/Pubs/334-305.pdf

* PCBs - polychlorinated biphenyls

Fish Advisory

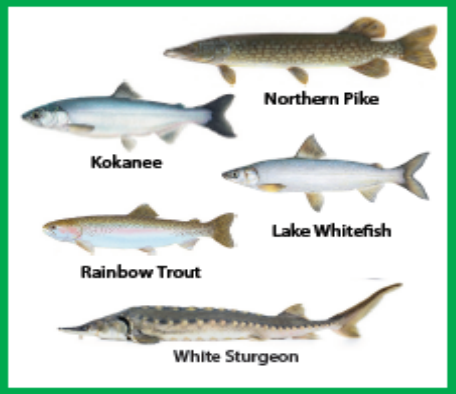
Upper Columbia River/Lake Roosevelt

Fish are nutritious, but certain fish in the Upper Columbia River contain contaminants (mercury and PCBs) that can harm your health.

Babies and children are most at-risk.
Women who are or might become pregnant, nursing mothers, and children should follow all of this advisory.

How much can I eat?

	HEALTHY CHOICE	LIMIT	CAUTION
Women 18 - 45 especially if pregnant **Children 1 - 17**	**2- 3 servings per week** Kokanee Lake Whitefish Rainbow Trout White Sturgeon Northern Pike	**1 serving per week** 4 servings per month of any combination of these 5 fish	**2 servings per month** Largescale Sucker Largemouth Bass
Women 46 and older and not pregnant **Men 18 and older**	**7 servings per week** Kokanee Lake Whitefish Rainbow Trout White Sturgeon Northern Pike	**3 servings per week** 12 servings per month of any combination of these 5 fish	**5 servings per month** Largescale Sucker Largemouth Bass



OR

OR

OR

OR

How to Use this Table

Women under age 46 and children under age 18 should eat from either the green or yellow column.

Examples:

If a child eats 1 serving of kokanee and 1 serving of rainbow trout, no other fish should be eaten that week.

If an 18-year-old man eats 3 servings of walleye in a week, no other fish should be eaten that week.

DO NOT EAT

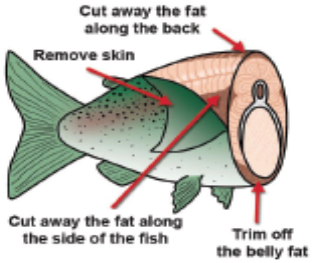
Northern Pikeminnow

What is a serving?

For Adults For Children

A serving is about the size and thickness of your hand. Give children smaller servings.

Preparing Fish the Healthy Way



Fish are part of a healthy diet.

Following these tips will reduce the amount of chemical contaminants you eat (like PCBs) that collect in the fat of fish. Mercury cannot be reduced; it builds up in fish meat (the fillet).

- Before cooking remove the skin, fat, and internal organs.
- Eat younger and smaller fish (within legal limits).
- Eat a variety of fish.

Washington State Department of Health

Questions?

Department of Health
Toll Free: 1-877-485-7316
Visit: www.doh.wa.gov/fish

Updated from DOH 334-329 June 2015

Available in other formats for people with disabilities 1-800-525-0127 (TDD/TTY call 711).

Beaches, Sediment & River Water

Public Beaches and the river are safe for recreation

- Bossburg Flat Beach is closed to the public because of high lead levels
- The State of Washington is cleaning up the Northport waterfront.

Human Health Risks from river water and sediment are low.

Fish consumption contributes to non-lead risk

- Non-cancer benchmark exceeded for children only exceeded when adding consumption of some fish species
- Individuals should follow state fish advisory recommendations

Risk to outdoor workers is minimal.

Air

None of the three metals monitored from 2002 to 2009 near Northport exceeded risk benchmarks.

We are also evaluating more recent data collected from the International border.

- Arsenic
- Cadmium
- Lead

Upland Soil - Sampling

- 588 residential areas were voluntarily sampled to estimate risk to current residents.
- 142 larger areas (25-acres) were randomly selected and sampled to estimate risk to potential future residents and to map the nature and extent of aerial deposition of metals.
- Residential exposure exceeds lead and non-lead benchmarks.

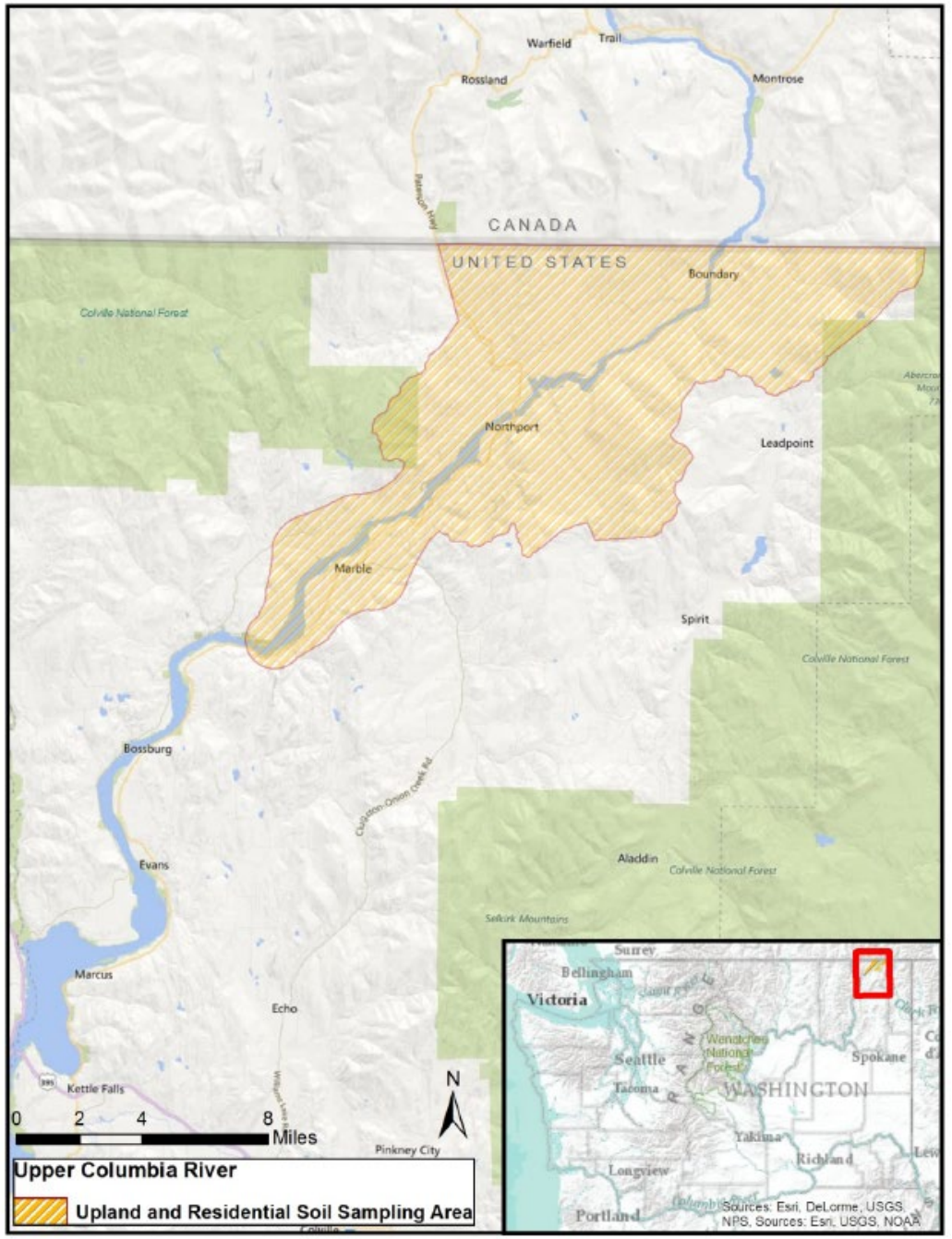


Figure 1. Approximate area of the upper Columbia River valley where soil has been sampled and metals may be above normal as of 2016.

Resident Exposure Groups

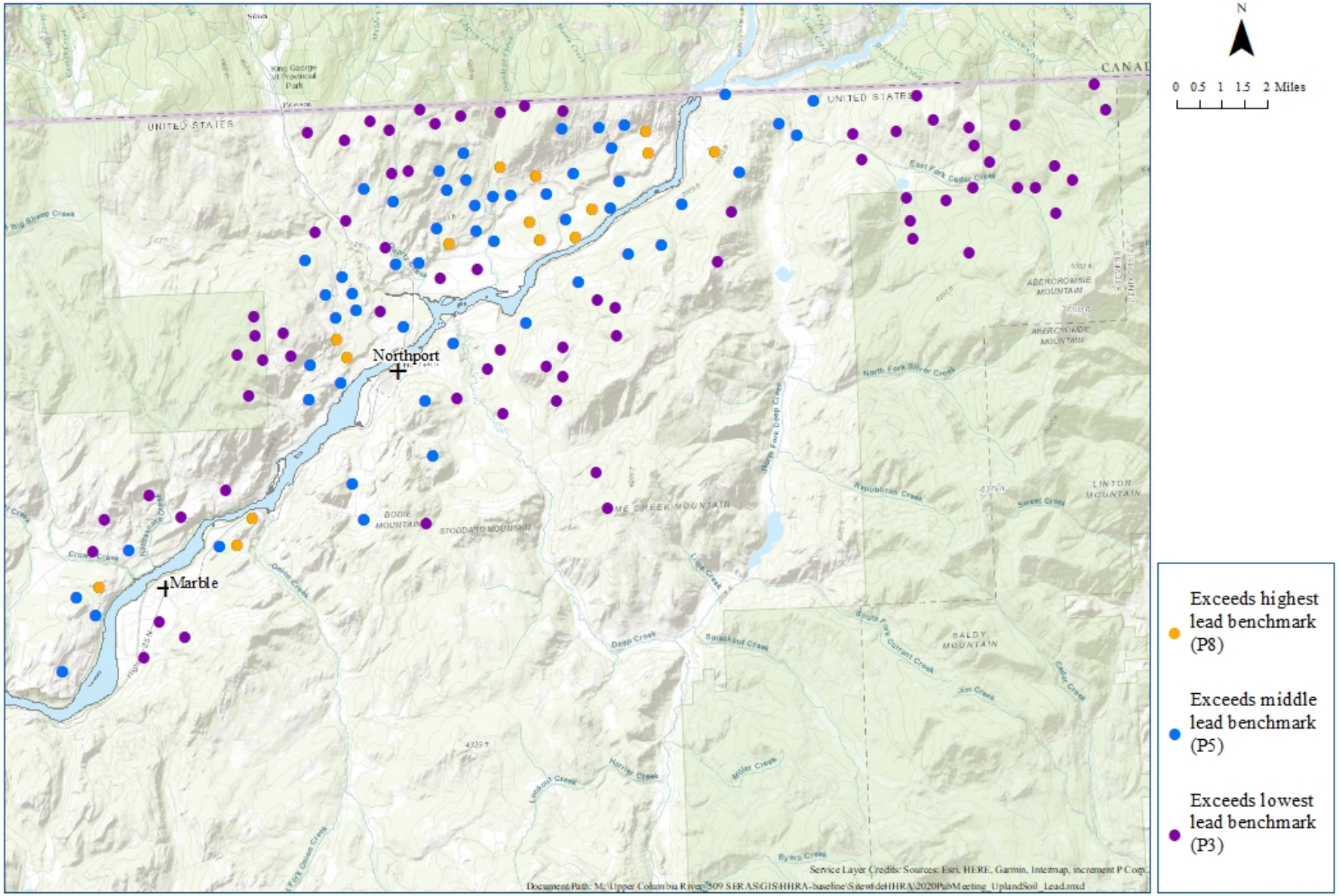
Current Residents

- About 15% of residential areas sampled exceed the "**Mid**" benchmark for lead
- About 2% of exceed the "**High**" benchmark for lead
- Removal actions were taken in 2015 & 2017-2018 at 18 properties that were heavily contaminated (>50% above the "**High**" benchmark)

Potential Future Residents

- About 48% of sampled areas exceed the "**Mid**" benchmark for lead
- About 36% exceed the "**High**" benchmark for lead

Upland Soil ADAs Where Lead Risk Exceeds Benchmarks



Upland Soils – Key points

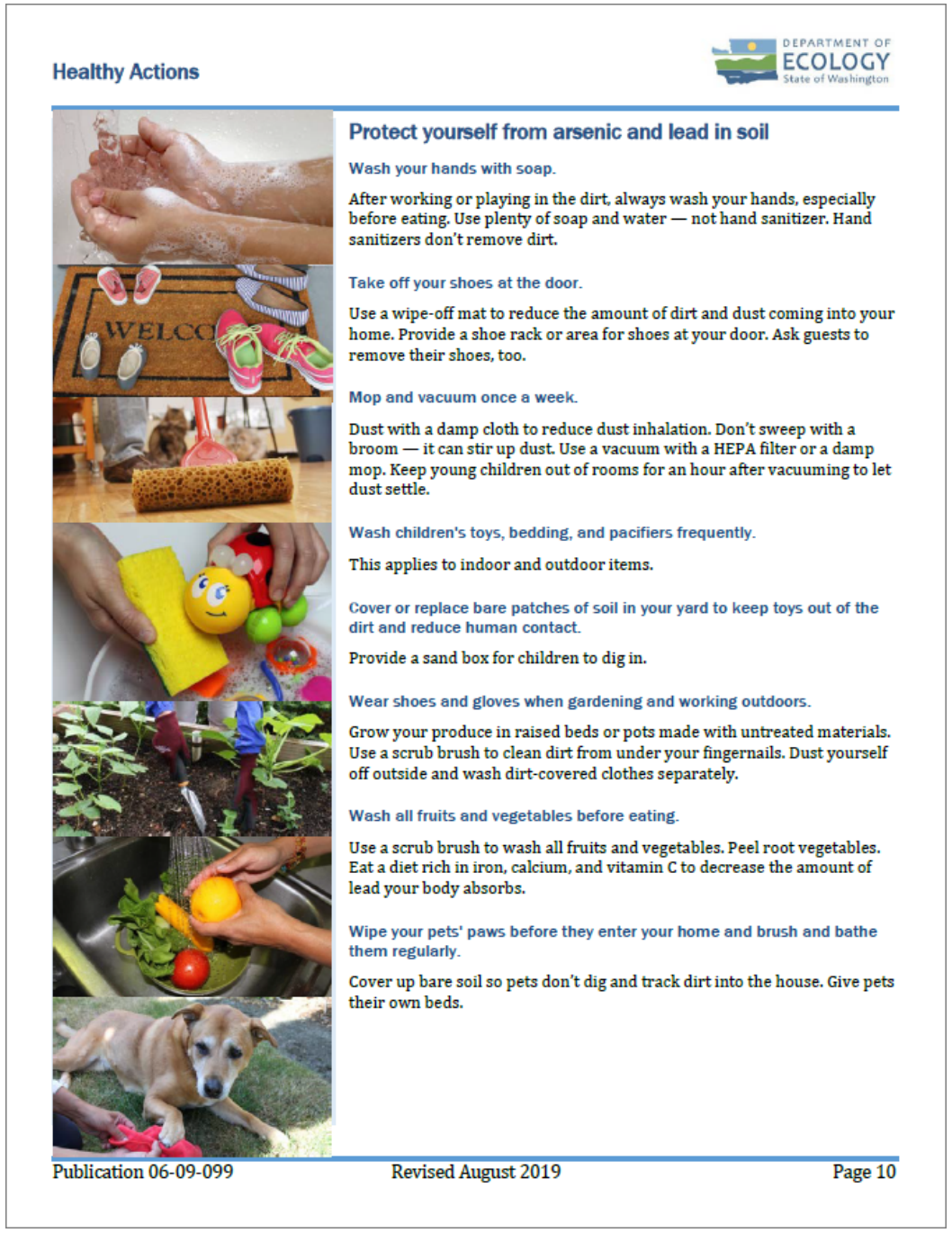
- Lead in soil is the risk driver
- Soil is more contaminated the closer you are to the CA-US border and the Columbia River
- Undeveloped lands are generally more contaminated than developed lands
- Upland soil does not present a risk to outdoor workers
- Residents in impacted areas are advised to follow state recommendations on reducing exposure.

Healthy actions to protect you from lead in dirt

- Wash your hands with soap
- Take off your shoes at the door
- Mop and vacuum once a week
- Wash children’s toys and pacifiers frequently
- Wipe your pet’s paws before they enter your home
- Wash all fruits and vegetables before eating

More Tips:

https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Dirt-Alert-program/Healthy-actions



Healthy Actions

DEPARTMENT OF ECOLOGY State of Washington

Protect yourself from arsenic and lead in soil

Wash your hands with soap.

After working or playing in the dirt, always wash your hands, especially before eating. Use plenty of soap and water — not hand sanitizer. Hand sanitizers don't remove dirt.

Take off your shoes at the door.

Use a wipe-off mat to reduce the amount of dirt and dust coming into your home. Provide a shoe rack or area for shoes at your door. Ask guests to remove their shoes, too.

Mop and vacuum once a week.

Dust with a damp cloth to reduce dust inhalation. Don't sweep with a broom — it can stir up dust. Use a vacuum with a HEPA filter or a damp mop. Keep young children out of rooms for an hour after vacuuming to let dust settle.

Wash children's toys, bedding, and pacifiers frequently.

This applies to indoor and outdoor items.

Cover or replace bare patches of soil in your yard to keep toys out of the dirt and reduce human contact.

Provide a sand box for children to dig in.

Wear shoes and gloves when gardening and working outdoors.

Grow your produce in raised beds or pots made with untreated materials. Use a scrub brush to clean dirt from under your fingernails. Dust yourself off outside and wash dirt-covered clothes separately.

Wash all fruits and vegetables before eating.

Use a scrub brush to wash all fruits and vegetables. Peel root vegetables. Eat a diet rich in iron, calcium, and vitamin C to decrease the amount of lead your body absorbs.

Wipe your pets' paws before they enter your home and brush and bathe them regularly.

Cover up bare soil so pets don't dig and track dirt into the house. Give pets their own beds.

Next Steps

Human Health Risk Assessment

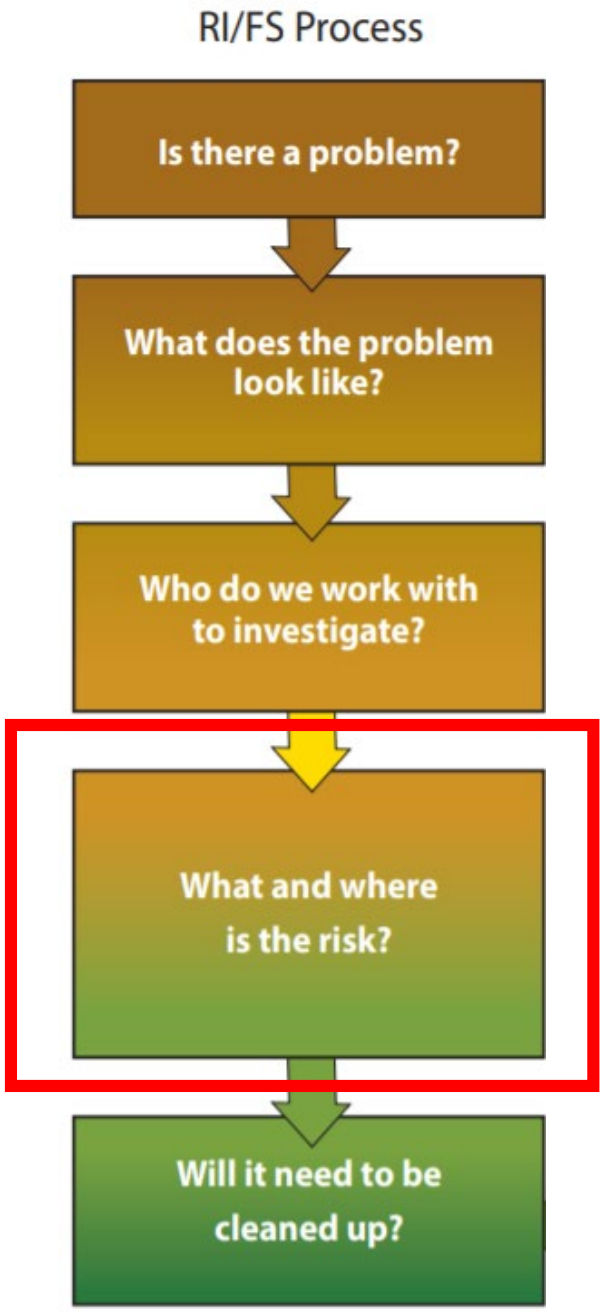
- Draft review: May 26 – July 24
- Spokane Tribe of Indians Appendix: Summer, 2020
- Final Report: 2020

Baseline Ecological Risk Assessment

- Phase 3 Sediment Study: 2020
- Final Report: 2022

Soil Amendment Technology Evaluation

- Lab Bench-Scale Study: ~ 2021
- Field Studies: ~ 2023



Draft Human Health Risk Assessment

Available Now:

https://www.epa.gov/columbiariver/upper-columbia-river-remedial-investigation-feasibility-study

Feedback will be accepted through July 24, 2020. Comments should be submitted to Robert Tan at tan.robert@epa.gov.

- Include “HHRA Comments” in the subject line.

Responses to comments will be included as an appendix in the final Human Health Risk Assessment report.

Feedback Examples

An example of helpful feedback:

Comment: *"The report lumps all of fish species together. It would be helpful to consider risk from ingesting* specific fish *species."*

A less-helpful example:

Comment: "This report is wrong"

Questions?

Contacts

EPA
Robert Tan (Human Health)
(206) 553-2580
tan.robert@epa.gov

Kathryn Cerise (Ecological Assessment)
(205) 553-2589
cerise.Kathy@epa.gov

National Park Service
Jeff Johnson
(208) 277-6286
jeffrey_k_johnson@nps.gov

WA Department of Ecology
John Roland
(509) 329-3581
JROL461@ECY.WA.GOV

Teck American Incorporated
Kris McCaig
(509) 623-4501
Kris.mccaig@teck.com

Colville Confederated Tribes
Cindy Marchand
(509) 634-2075
Cindy.Marchand@colvilletribes.com

Spokane Tribe
Tamara Knudson
(509) 244-7031
tamarak@spokanetribe.com

Citizens for a Clean Columbia
Mindy Smith
smithm69@msu.edu