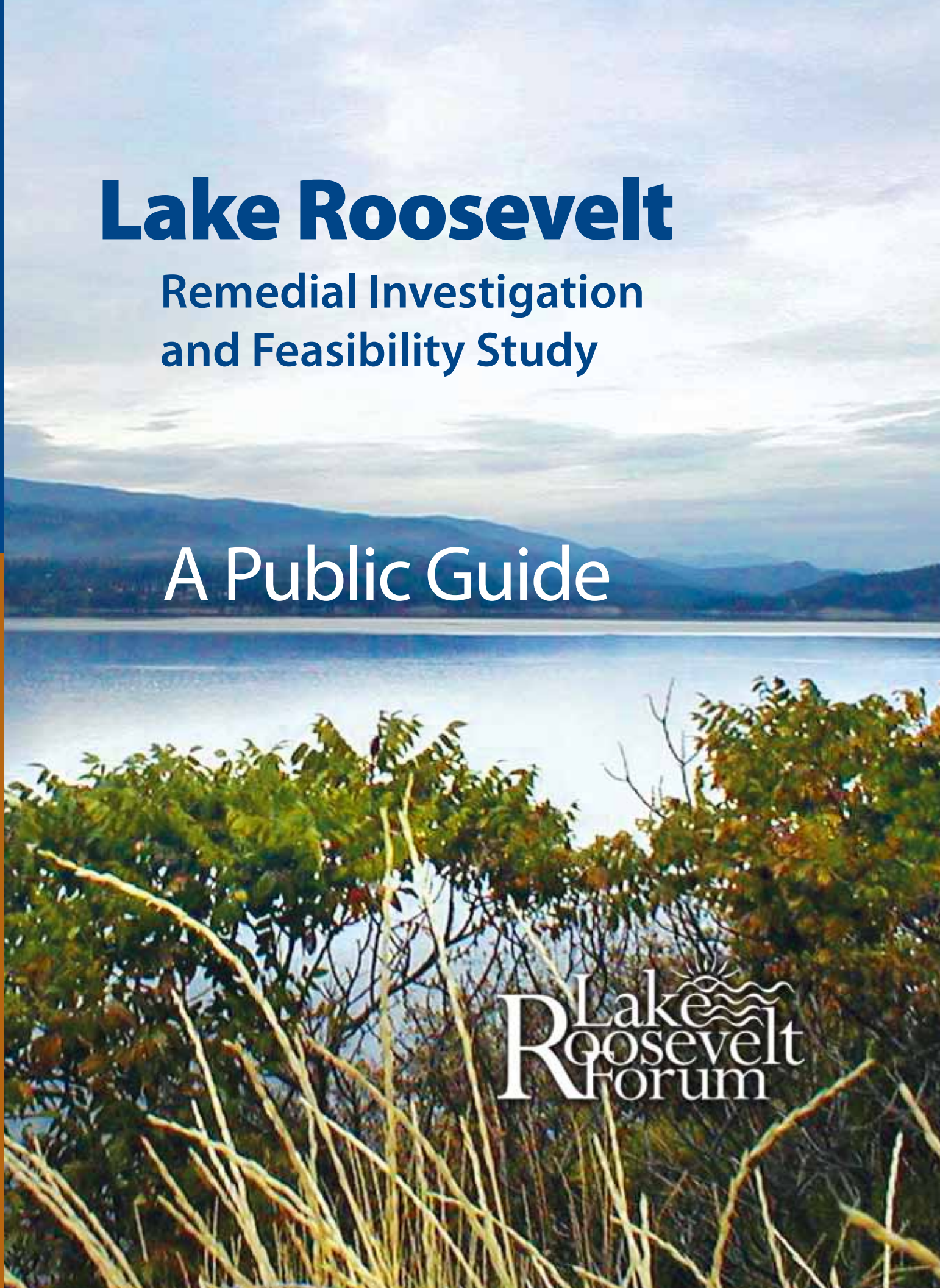
Lake Roosevelt

Remedial Investigation and Feasibility Study

A Public Guide



Background

Contaminants in Lake Roosevelt

More than forty million dollars has been spent over the past five years to investigate the nature, extent and possible human health and ecological risks of contaminants found in the upper Columbia River, which includes Lake Roosevelt. The Environmental Protection Agency (EPA) refers to the investigation as the Upper Columbia River (UCR) Site.

As the history time line shows, the legacy of contaminants entering Lake Roosevelt dates back over a century. EPA has traced most of it to the Trail smelter, sited along the Columbia nine miles north of the U.S./Canadian border. Waste from the smelter carried metals and other contaminants downstream into Lake Roosevelt. EPA also identified, to a lesser degree, other mining, milling, smelting, and pulp industries as potential sources.

The original Trail smelter processed copper and gold. Teck bought the smelter in the early 1900s, and has processed other metals over the years. Current operations focus on smelting of zinc and lead for use in vehicles, batteries and numerous household products. EPA estimates that Teck discharged wastewater (liquid effluent) and up to 23 million tons of contaminated granulated fumed slag into the upper Columbia River.

In 1995 Teck ceased discharging granulated slag. In 1997 Teck implemented the Trail Modernization Program which, along with prior efforts, significantly improved the quality of wastewater being discharged into the river and the facility's overall environmental performance. Since the 1997 modernization, accidental spills of liquid effluent and slag have occurred. Continuing to improve performance is something Teck, Environment Canada and communities continue to address.

Assessing Human Health and Ecological Risks

United States Superfund law (technically called the Comprehensive Environmental Response, Compensation and Liability Act, or CERCLA) guides the investigation and assessment for evaluating human health and ecological risks. Since 2006, Teck has funded this effort under an agreement with the United States Government.

EPA is overseeing Teck's efforts pursuant to its CERCLA authority, and Teck is required to perform the investigation that is consistent with CERCLA regulations. The assessment is called a Remedial Investigation and Feasibility Study (RI/FS). The RI/FS will also evaluate potential cleanup actions and other remedies. Based on results of the RI/FS, EPA can direct site cleanup and compel responsible parties to fund these efforts.

Sites like the Upper Columbia (which stretches over 150 miles and has over 600 miles of shoreline) are called mega-sites because of their size and complexity. As a result, conducting an RI/FS can take several years. Lake Roosevelt is no exception.

What We Know

This public guide shares with you:

- What is currently known,
- Information about additional RI/FS studies and activities that are either underway or planned,
- Background information to help understand what's being studied and why, and
- A time line showing why more years of investigation and assessment are planned.

In addition, the web version (www.lrf.org/public guide) includes several links to related studies and information.

This public guide provides an overview that will help you understand:

History

LeRoi Smelter, Northport, WA

1896 – Trail, Canada facility built as a copper and gold smelter.

1906 – Trail, Canada facility converted to lead and zinc smelter.

1900-1922 – Mining, milling, and smelter activities active in both Canada and the United States, all of which discharge metals into the Upper Columbia and its tributaries. Smelters permanently close at Northport, Grand Forks, Greenwood, and Boundary Falls.

1930s – International Joint Commission holds Trail Smelter in Canada liable for sulfur dioxide air emissions causing property damage in Washington.

1931 – A new Canadian fertilizer plant built to reduce sulphur dioxide emissions becomes a primary source of phosphate discharges into the Columbia.

1942 – Grand Coulee Dam gates close, raising the waters behind the dam 380 feet. Water flows and bank erosion change, affecting depositional patterns of sediment contamination.

1960 – Celgar Pulp Mill begins operation.

1990-1993 – WA Department of Ecology (Ecology) monitors dioxin, furan and trace metal concentrations in suspended particulate matter and fish tissues. The Celgar pulp mill is considered the primary historical source for dioxin and furan contaminants. Celgar plant modernization designed to end discharges of dioxins and furans into the Columbia.

1992 – The USGS conducts a sediment study of Lake Roosevelt describing the transport of metals, the presence of trace metals in bed sediment, and the toxicity of the sediment to benthic invertebrates.

1993 – Ecology initiates studies resulting in Lake Roosevelt being placed on the federal Clean Water Act Section 303(d) list of impaired water bodies.

1994 – Canadian fertilizer plant ceases discharge of phosphate into the Columbia.

1994 – The USGS conducts a fish tissue study to determine the level of mercury and other metals in walleye, smallmouth bass, and rainbow trout. Based on findings, a fact sheet from the Washington State Department of Health (WDOH) advises the public to limit consumption of walleye.

1995 – Discharges of slag from Trail smelter cease.

1997 – Teck implements Trail Modernization Program to further improve quality of effluent (wastewater) being discharged.

1998 – In Canada, wide area human and ecological risk assessment initiated from Castlegar to the U.S. border.

1998 – USGS conducts a follow-up fish tissue study and finds that concentration levels of metals had either not changed or decreased. Ecology identifies temperature, total dissolved gas, mercury, PCBs and pH as parameters for Lake Roosevelt inclusion on the Clean Water Act 303(d) list of impaired water bodies.

1999 – Colville Confederated Tribes petition EPA to conduct an assessment of environmental contamination in Lake Roosevelt under federal Superfund program.

2001-2003 – EPA collects samples of river sediments. EPA recommends a Remedial Investigation Feasibility Study (RI/FS) to assess environmental and human health risks.

2002 – 2006 – USGS collects data to determine concentrations of trace metals in wind blown dust.

2003 – After negotiations between EPA and Teck Cominco reach an impasse, EPA issues Unilateral Administrative Order under U.S. Superfund law to fund and conduct aspects of the RI/FS. Teck Cominco contests the order and EPA moves forward with the RI/FS using U.S. government funding.

2004 – Canadian government issues a "Diplomatic Note" to the U.S. State Department regarding EPA enforcement order. United States and Canadian governments begin discussions regarding site.

2004 – Colville Confederated Tribes and Washington State ask U.S. District Court to force Teck Cominco to comply with EPA order issued in 2003.

2004 – Ecology updates Clean Water Act 303(d) impairment list for Lake Roosevelt to include temperature, total dissolved gas, and mercury.

2005 – EPA RI/FS studies begin by initiating sediment sampling and fish tissue studies.

2006 – EPA reaches an agreement with Teck Cominco to conduct an RI/FS that Teck Cominco will fund. Teck required to develop EPA approved RI/FS ecological work plan before studies can continue.

2006 – Ninth circuit upholds a district court ruling that Superfund (CERCLA) law does apply to Teck's Trail smelter.

2008 – Lake Roosevelt fish advisory updated.

2009 – RI/FS ecological and human health work plans approved by EPA. Teck Cominco (now called Teck) begins RI/FS studies.

Human Health Risk

Annually, up to 1.5 million visitors and community members swim, fish, play on the beaches, and tap Lake Roosevelt for drinking water.

To ensure that human health issues are addressed, the Washington Department of Health (DOH) prepares health consultations and, as needed, issues and/or updates advisories. Information in this section is based on DOH findings whenever possible.

EPA's human health risk assessment is not expected until 2013.

Are the Fish Safe to Eat?

The Washington DOH 2008 fish consumption advisory provides guidance for safely consuming fish in Lake Roosevelt (see Fish Advisory, page 5). An updated fish advisory, which will be based on EPA's 2009 sampling, is expected by fall 2011 and will be posted on the Lake Roosevelt Forum web site, www.lrf.org.

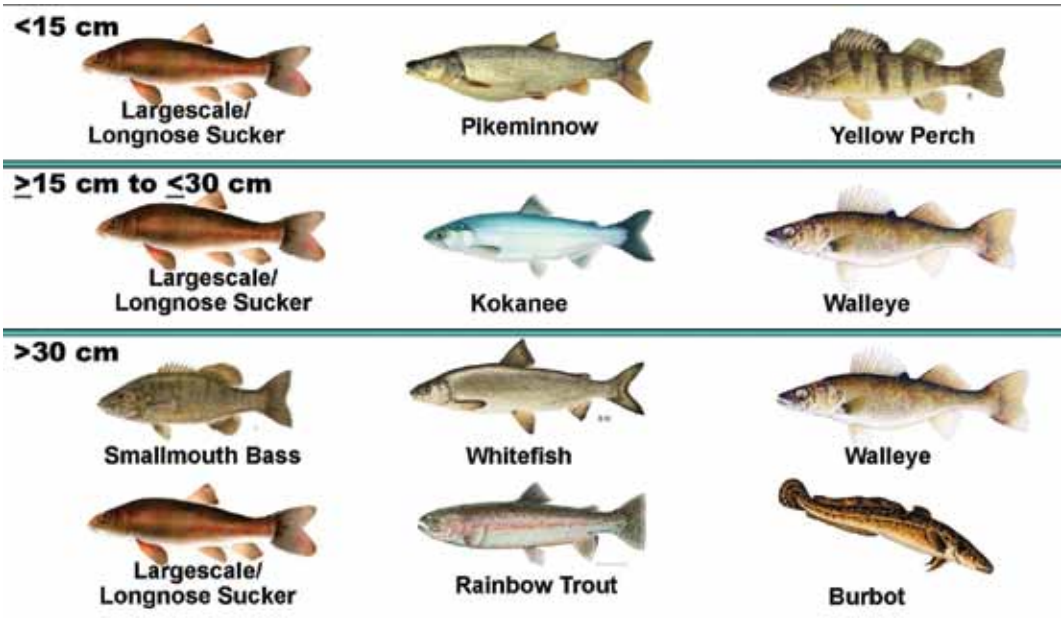
In the fall of 2009 over 2,300 fish were sampled as part of the RI/FS. Sampling included all size classes (small, medium and large) and a wide range of species (see Fish Species Sampled). Sampling occurred throughout the upper Columbia and Lake Roosevelt (see Study Areas for Fish, Surface Water and Beach Sampling).

Fish Sampling Team

Samples were tested for an array of inorganic and organic compounds. Examples of inorganic compounds include mercury and heavy metals such as arsenic, cadmium, copper, lead and zinc. Examples of organic compounds (which are man-made) include PCBs, dioxins/furans, PBDEs, and pesticides.

EPA's draft data summary report and preliminary findings indicate concentrations of metals and mercury in fish are similar to or slightly lower than those measured in 2005. EPA will use results of this sampling for its human health risk assessment (which is not expected before 2013) and its ecological risk assessment (which is not expected before 2014).

Fish Species Sampled



Lake Roosevelt Fish Consumption Advisory and Statewide Mercury Advisory

Fish in Lake Roosevelt contain chemicals, including mercury that may be hazardous to your health. Women who are or might become pregnant, nursing mothers, and young children may be especially at risk.

These individuals should limit the amount of fish they consume from Lake Roosevelt to:

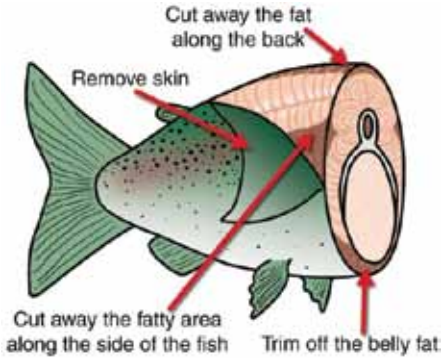
- 2 meals per month: smallmouth bass, largemouth bass, and walleye, or
- 4 meals per month: sucker or burbot, or
- 2 meals per month of any combination of species listed above.
- Do not eat northern pikeminnow.

Largemouth bass, smallmouth bass, and northern pikeminnow were not sampled from Lake Roosevelt, but are listed on the Washington Department of Health's Statewide Mercury Advisory.

To reduce your exposure when eating fish:

Prepare fish the following way to reduce PCBs and other contaminants that collect in the fatty parts of the fish by up to 50 percent:

- When cleaning fish remove the head, skin, fat, and internal organs before cooking. Do not use for sauce or gravy.
- Grill, bake, or broil fish so that the fat drips off while cooking.
- Mercury is stored in the muscle (fillet) of fish and cannot be reduced by cleaning this way.



Check local fish advisories:
1-877-485-7316 or www.doh.wa.gov/fish

2005, 2009, 2010 and 2011 beaches sampled for potential public exposure to contaminants

AA Campground – Sampled in 2005 and 2011
Barnaby Island Campground – Sampled in 2010
Black Sand Beach – Sampled in 2005 and 2009
Bossburg Flat – Sampled in 2011
Bradbury Beach – Sampled in 2011
China Bend – Sampled in 2010
Columbia – Sampled in 2005
Colville Flats – Sampled in 2011
Colville River – Sampled in 2011
Crescent Bay – Sampled in 2011
Dalles Orchard – Sampled in 2005 and 2010
Enterprise – Sampled in 2011
Evans Campground – Sampled in 2011
Flat Creek – Sampled in 2011
French Rocks – Sampled in 2005
Haag Cove – Sampled in 2005
Hunters – Sampled in 2011
Jones Bay – Sampled in 2011
Kamloops Island – Sampled in 2011
Keller Ferry – Sampled in 2005
Kettle Falls Marina – Sampled in 2005 and 2011
Lincoln – Sampled in 2005
Lyons Island – Sampled in 2011
Marcus Island – Sampled in 2005
McGuire's – Sampled in 2011
Mitchell Point – Sampled in 2011
Mouth of Hawk Creek – Sampled in 2011
Naborlee – Sampled in 2011
Nez Perce Creek – Sampled in 2011
North Gifford – Sampled in 2005
North Gorge – Sampled in 2005
Northport Beach – Sampled in 2005 and 2010
Onion Creek - Rejected due to Rock in 2009
Rogers Barr, Sampled in 2005
Seven Bays – Sampled in 2011
Snag Cove - Rejected due to Rock in 2009
Spring Canyon – Sampled in 2005 and 2011
Summer Island – Sampled in 2010
Swawilla Basin – Sampled in 2011
Swimming Hole Beach – Sampled in 2011
Upper Columbia R.V. Park – Sampled in 2009
Welty Bay – Sampled in 2011
Whitestone Campground – Sampled in 2011
Wilmont Creek – Sampled in 2011

Human Health Risk

Beach Exposure

A 2009 Health Consultation from the Washington Department of Health, based on EPA sampling collected in 2005, concluded there is "no apparent public health hazard."

Black Sand Beach during removal

The 2005 EPA sampling included fifteen beaches. The criteria used for assessing exposure were children or adults being exposed for two days per week for four months, or 35 days per year for area residents. In both cases "DOH concludes that touching, breathing, or accidentally eating sediment … is not expected to harm people's health." The 2009 health consultation can be found at http://www.doh.wa.gov/ehp/oehas/consults.htm.

Due to lead and arsenic concentrations that were above screening levels, EPA required additional testing at Black Sand Beach, Northport Boat Ramp and Dalles Orchard. In these cases:

Beach sampling

- In 2010 Teck agreed to remove and replace about 9,100 tons (approximately 6,500 cubic yards) of sediments containing granulated slag from Black Sand Beach. Slag was hauled to Trail, British Columbia for recycling, and clean fill material was used to establish the new beach. Teck conducted this action voluntarily under an agreement with the Washington Department of Ecology Toxics Cleanup Program that was independent of the RI/FS.
- EPA is currently evaluating contaminant data from the 2009 and 2010 beach sampling events. The results of this analysis will be available in late summer 2011 and will be shared with the public in an EPA fact sheet.

Consultation with tribes, state and federal agencies also led EPA to request testing at 33 additional beaches, many of which are campgrounds or used by local residents. Sampling at two of these beaches was conducted in 2009, and five of these beaches in 2010. In spring 2011, additional sampling occurred at 26 beaches. The Beach sampling list (see page 5) notes what beaches were sampled and when, including six that were tested more than once.

EPA's preliminary findings from 2009 and 2010 beach sampling are similar to those for 2005. Further, all of the beach results will be examined in greater depth in the EPA Human Health Risk Assessment, which is not expected until 2013.

Surface Water

Preliminary findings from surface water sampling indicate Lake Roosevelt is safe for swimming and recreation.

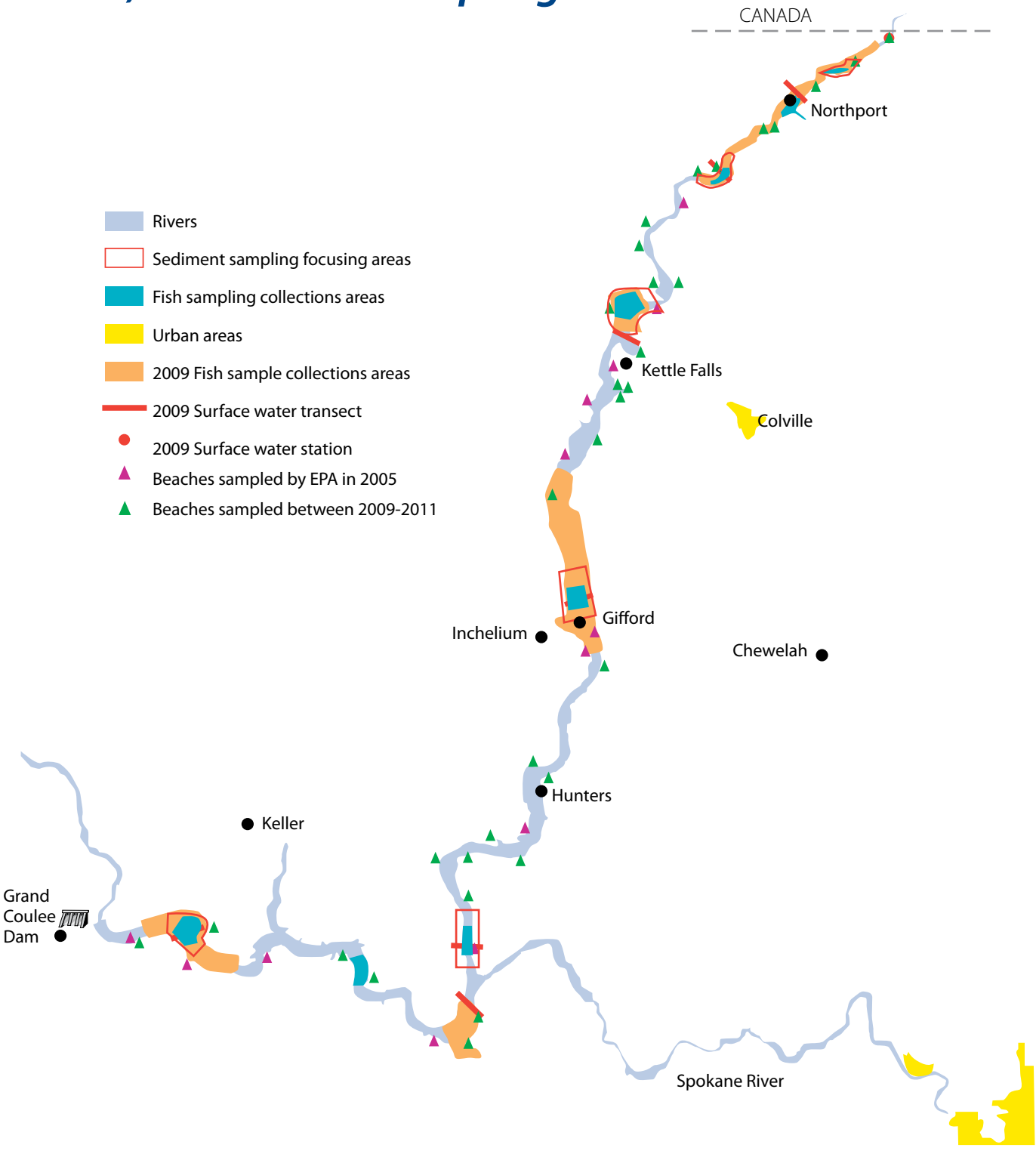
In more technical terms, undisturbed surface water sample concentrations for arsenic, cadmium, copper, lead, mercury, zinc and organics (e.g.—PCBs and dioxins/furans) are within limits protective of people and aquatic life.

Disturbed water sampling

Samples were collected in three different ways: unfiltered, filtered and disturbed. Disturbed water samples simulate a recreational situation, like a child running and playing in the water, where someone kicks up mud and other beach sediment. Specifically, these samples collect suspended sediment in shallow water near the shoreline. For disturbed water, aluminum, barium, iron, lead, manganese and nickel levels exceeded federal drinking standards in some samples.

Extending from the Canadian border to Grand Coulee Dam, surface water samples were taken from shore to shore in six locations and at different depths. Samples were also taken at three different times of year to determine whether differences in lake levels and water flow impact contaminant concentrations. In total, over 67,500 analyses were performed for the surface water sampling program.

Study Areas for Fish, Surface Water, and Beach Sampling



Human Health Risk

Recreational Use Survey

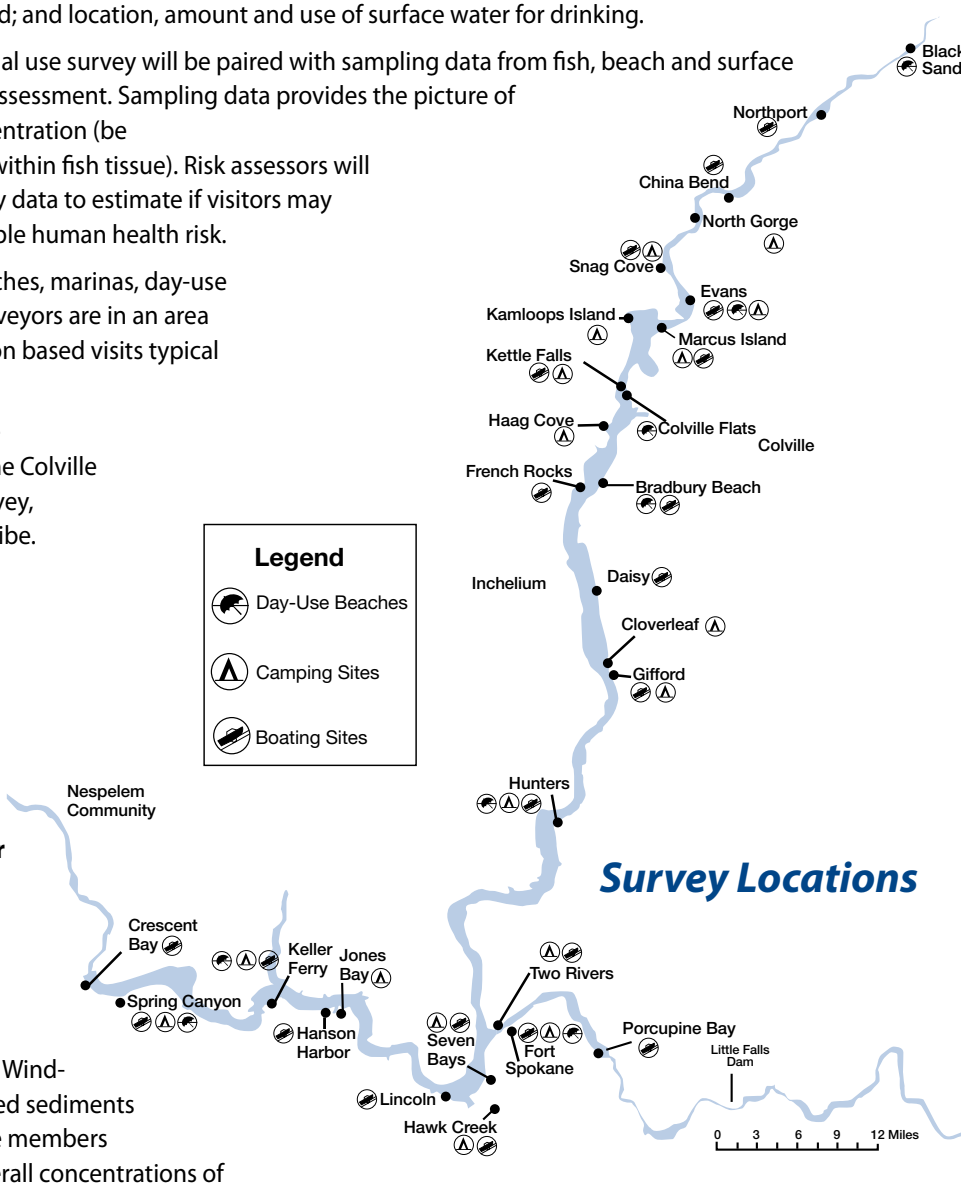
The recreational use survey will help determine if any human health risks may exist from exposure to contaminants.

From fall 2010 through fall 2011, 3,500 to 4,000 residents and visitors to Lake Roosevelt are being surveyed to determine how they spend their recreational time. Of critical importance are questions specific to activities that potentially expose people to contaminants. For instance, what types of fish are caught, where are they caught and how often are they consumed; what beaches are visited, type of activities pursued and when are they visited; and location, amount and use of surface water for drinking.

Ultimately, information from the recreational use survey will be paired with sampling data from fish, beach and surface water studies in EPA's Human Health Risk Assessment. Sampling data provides the picture of where contaminants are and in what concentration (be they dissolved in the water, on a beach or within fish tissue). Risk assessors will combine the sampling data with the survey data to estimate if visitors may be subjecting themselves to an unacceptable human health risk.

Surveyors will contact visitors at boat launches, marinas, day-use beaches and campgrounds. How often surveyors are in an area will reflect seasonal, day-to-day and location based visits typical of the area.

For similar reasons, a consumption and use survey is being taken of people living on the Colville reservation. For information about this survey, contact EPA or the Colville Confederated Tribe.



Air Inhalation

A report prepared for the Department of the Interior by Industrial Economics, Incorporated found that human inhalation of airborne sediment particles containing lead and other heavy metals are within EPA acceptable risk standards for cancer and non-cancer health effects resulting from both acute and chronic exposures.

From 2002 through 2006, the United States Geological Survey (USGS) collected air samples from Inchelium, Seven Bays, Kettle Falls (2002) and Marcus (2003-2006). Wind-blown dust events created by exposed, dried sediments has been a long-standing concern by some members of the community. USGS reported that overall concentrations of particulate matter recorded at these monitoring stations did not exceed Federal standards (e.g., the National Ambient Air Quality Standards). In addition, analysis by USGS found that concentrations of metals in the air did not exceed California EPA air quality standards for arsenic and cadmium. Federal and state standards are not available for other metals.

The Department of the Interior requested Industrial Economics, Incorporated (IEc) to further evaluate the USGS data. The report focused on potential exposures and risks to non-tribal people, e.g. - - residents, park employees, and visitors. IEc found the risks from inhalation of windblown sediment to be below EPA standards and benchmarks for all contaminants and scenarios evaluated.

EPA will further evaluate air inhalation concerns as a part of the RI/FS Human Health Risk Assessment that is not expected until 2013.

Additional RI/FS Studies

Sturgeon Toxicity Testing

Two different types of lab tests have been conducted to assess how exposure to contaminants in surface water and sediment may affect early life-stages of upper Columbia River white sturgeon.

Once abundant in the area, studies indicate only about 3,000 adult white sturgeon remain from Grand Coulee Dam to Revelstoke, Canada. Of particular concern is that newly hatched sturgeon generally do not survive more than a few weeks.

Native white sturgeon are "bottom dwellers" and are mainly found in the area from Marcus Flats to the Canadian border. This is the same area where stream flow has deposited the greatest quantities of slag (the black, sand-like industrial material containing metals released from smelting operations).

The sturgeon toxicity studies will help determine what sediments and concentrations of metals such as cadmium, copper, and zinc are toxic (acutely and chronically) to early life stages of white sturgeon as compared to rainbow trout; and whether or not sediments from the river represent an unacceptable risk to white sturgeon. Information from these studies will also help to evaluate if surface water concentrations in Lake Roosevelt represent an unacceptable risk to white sturgeon.

Photo by David R. Gluns

Independent of the EPA studies, there is also a White Sturgeon Recovery Initiative that includes American and Canadian natural resource managers and scientists. They are looking at a wide range of factors that may be contributing to the decline of white sturgeon. Most importantly, this initiative's goal is to actively restore healthy and sustainable populations of upper Columbia white sturgeon. To learn more about their findings and sturgeon releases, go to www.uppercolumbiasturgeon.org.

Sediment and Upland Soil Testing

RI/FS field sampling and analysis for the sediment and upland soil environments is projected to begin in 2012.

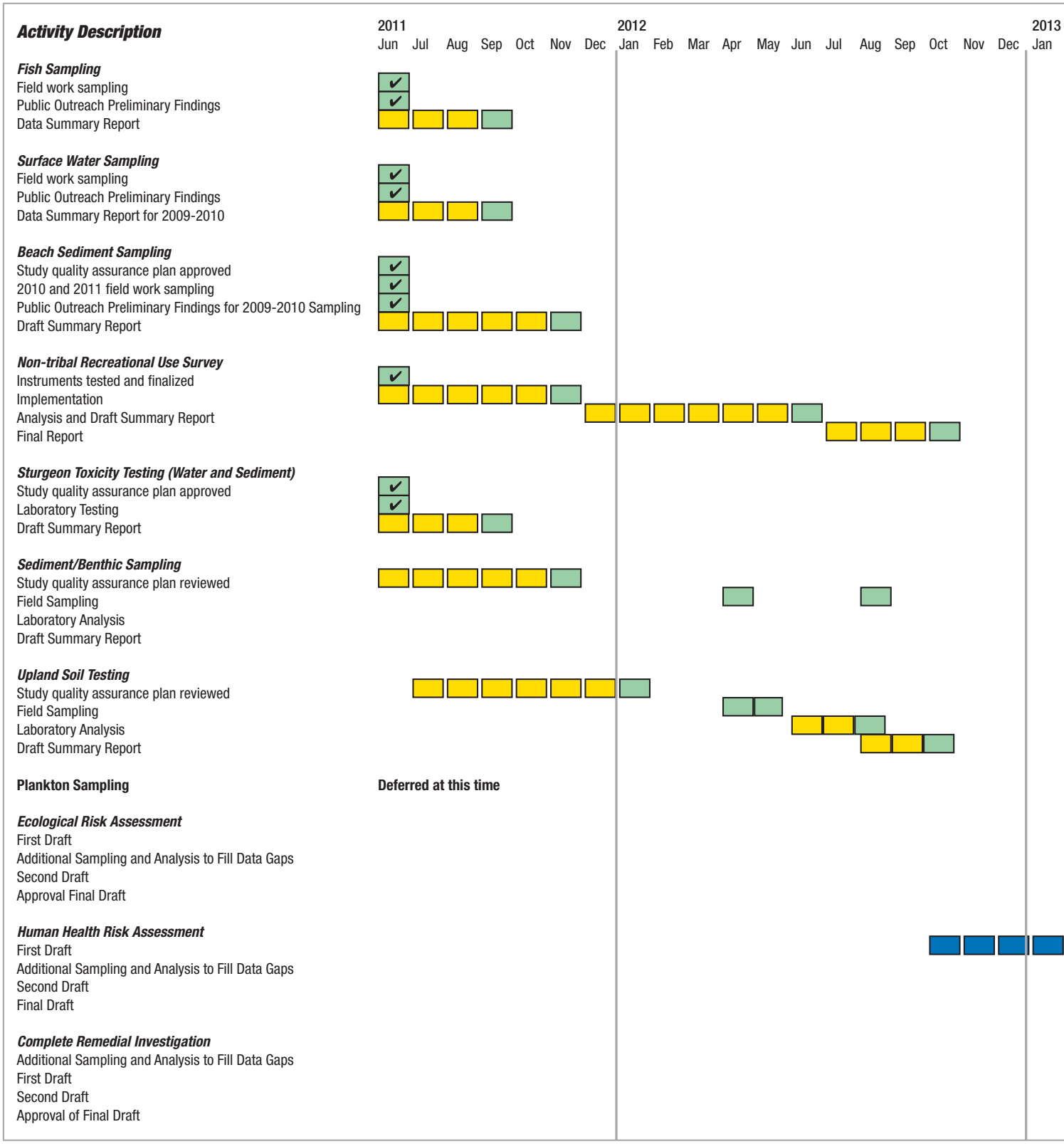
Sediment testing will expand on work completed in 2005 and will focus on determining if there are unacceptable risks to benthic invertebrates (sediment dwelling insects such as mayflies and worms) and other aquatic life exposed to contaminants of concern. These benthic invertebrates are key components of the aquatic food chain.

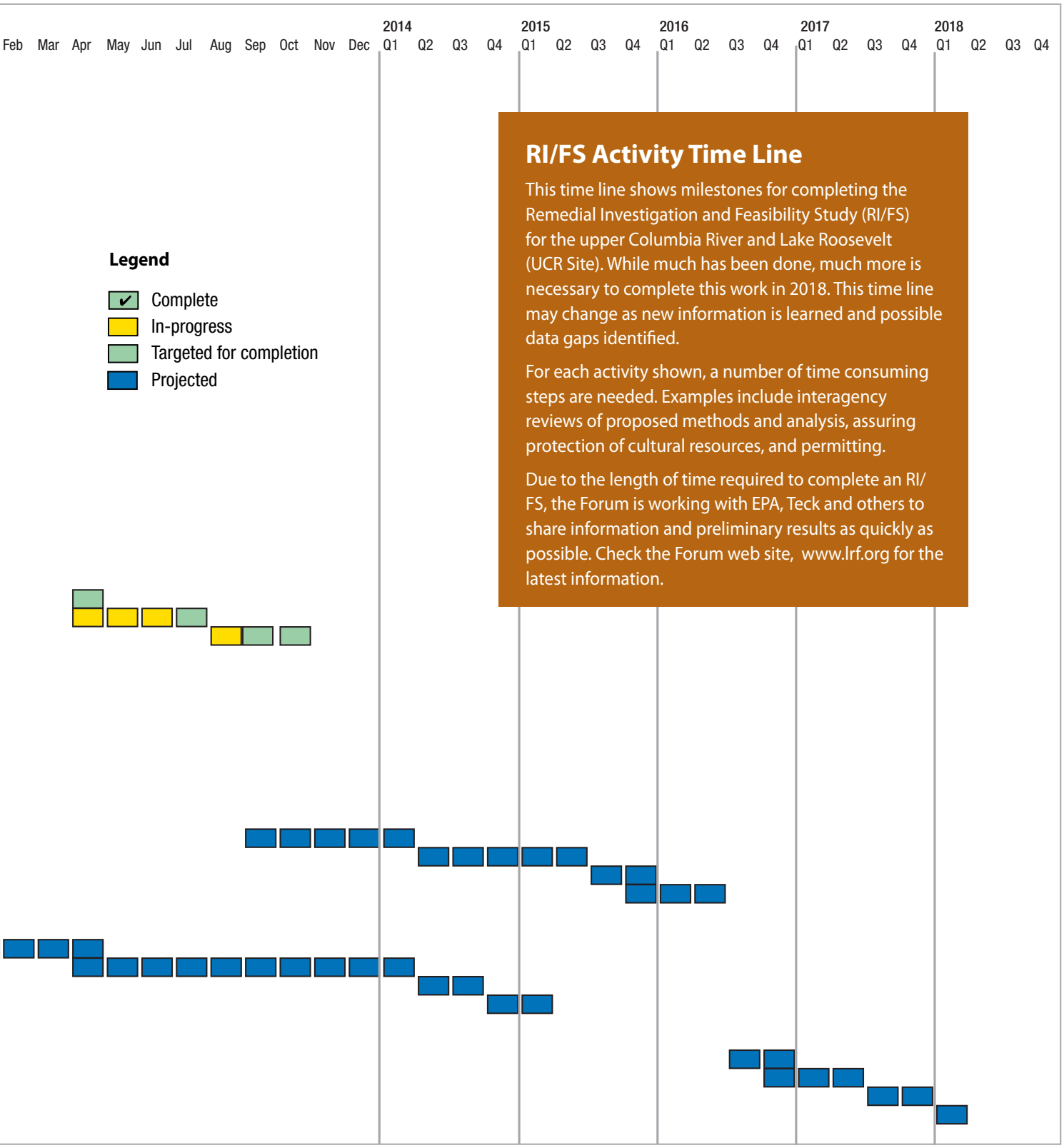
Upland soil testing will determine whether contamination released to the air from smelter stacks has resulted in unacceptable risks in soils. This study will help answer several key questions, such as:

- Is it safe for people to touch, breathe or accidentally ingest soils adjacent to the river/lake?
- Are the survival, growth or reproduction of insects affected?
- Can upland soil contaminant concentrations affect the reproduction, growth or survival of birds, mammals, land based invertebrates, plants, reptiles or amphibians?

Sturgeon toxicity testing lab

RI/FS Activity Time Line





RI/FS Activity Time Line

This time line shows milestones for completing the Remedial Investigation and Feasibility Study (RI/FS) for the upper Columbia River and Lake Roosevelt (UCR Site). While much has been done, much more is necessary to complete this work in 2018. This time line may change as new information is learned and possible data gaps identified.

For each activity shown, a number of time consuming steps are needed. Examples include interagency reviews of proposed methods and analysis, assuring protection of cultural resources, and permitting.

Due to the length of time required to complete an RI/FS, the Forum is working with EPA, Teck and others to share information and preliminary results as quickly as possible. Check the Forum web site, www.lrf.org for the latest information.

Conceptual Site Model

Tracing the connection between contaminants in the environment and potential human and ecological risks is very complex. The Conceptual Site Model serves as a schematic for investigators to collect data from multiple sources, and then trace these sources to the point where an environmental or human health risk may be present. On a system as large as the Upper Columbia and Lake Roosevelt, this requires collecting and analyzing thousands of data points.

The model begins by identifying chemicals of interest (e.g.--metals, including mercury) and organics (e.g.--PCBs, polychlorinated biphenyls). For each chemical there are potential sources, e.g. -- a smelter operation that discharged metals in the form of slag, wastewater, or air particles.

Scientists (as the site model graphic shows) identify the exposure media, the way in which chemicals of potential concern can enter our air, water, soil, etc. From here, exposure pathways are identified to assess whether a human health or ecological risk is present. The Pathways section shows how this can occur for humans.

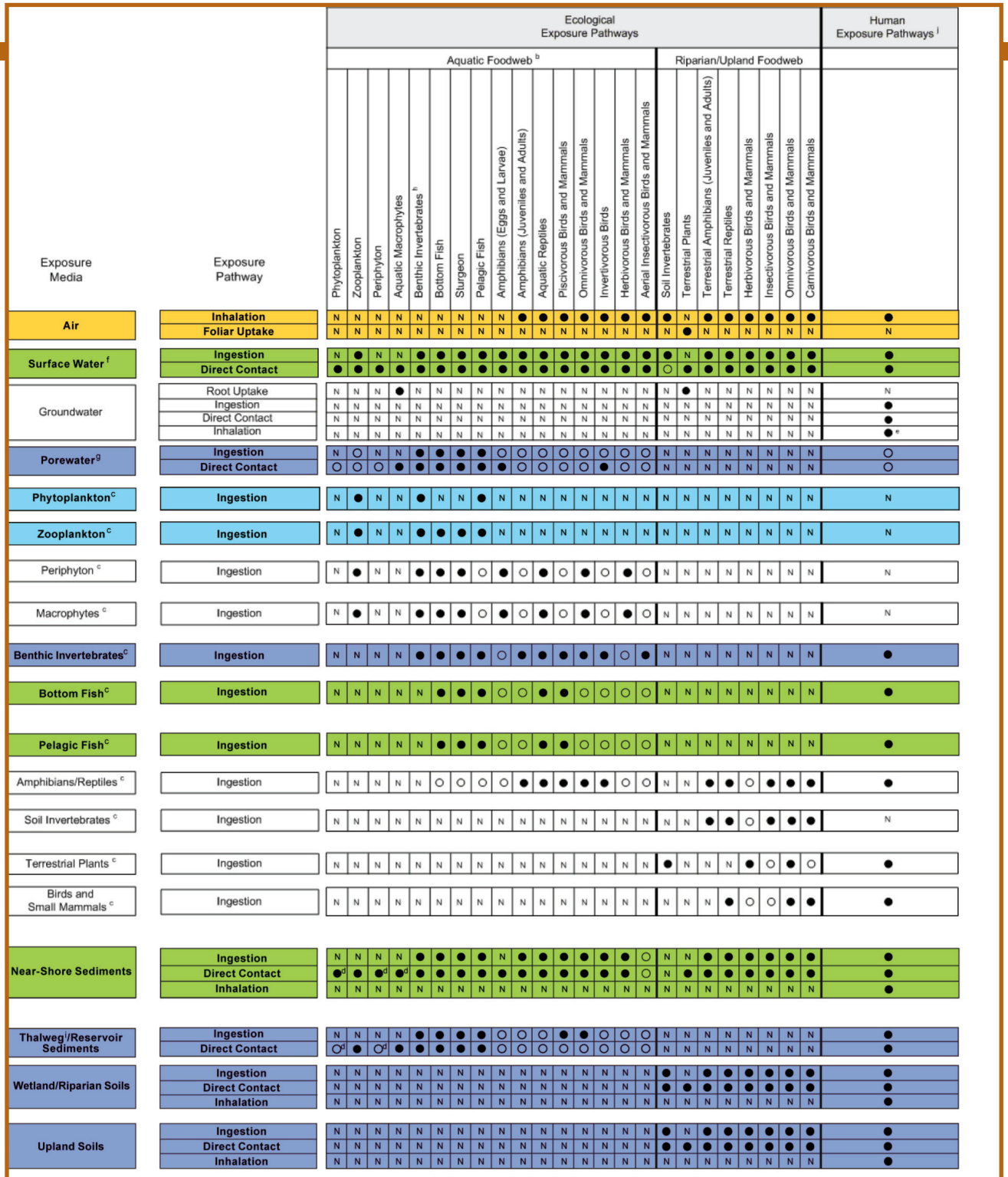
Different physical and chemical interactions can occur in each of the pathways. The interactions, collectively called transport and fate, are studied by scientists and evaluated to better understand how, where, and in what form chemicals of interest may be present in the environment. Granular slag, for instance, can end up in riverine sediments in the reservoir, or be suspended in the water column. Particles can also change during transport as they attach to larger particles, split into smaller particles or dissolve. These complex transport and fate mechanisms can distribute chemicals of interest throughout the upper Columbia and Lake Roosevelt environment.

RI/FS activities measure the chemical concentrations within exposure media, then consider risks to people, wildlife and plants exposed. For example chemicals may end up in the air, surface water, sediment, soil, groundwater, pore water (water found between particles of sediment), and biota (plants and animals). The concentrations of these chemicals are needed to complete the human health and ecological risk assessments.

The graphic shows the exposure media and their pathways. It also shows what data has, will, or may be collected for each. The potential that a receptor can come into contact with a contaminant is illustrated by the solid circles within the CSM, e.g. a complete pathway. For this reason, concentrations in certain exposure media (such as surface water) can provide information for both the human health and ecological risks assessment.

As data are collected and analyzed, EPA (in consultation with tribes and participating parties) must determine if data gaps still exist and additional sampling needed. The time line of RI/FS activities (see page 10) shows this feedback loop. Decisions about when sufficient data has been collected are the most important variable in how long RI/FS activities will continue.

Exposure Media and Pathways



Legend:

- ● Exposure Pathway Potentially Complete
- ○ Incomplete Exposure Pathway
- N Pathway Not Applicable
- Data Collection Completed
- Data Collection Deferred by EPA
- Data Collected by USGS
- Data Collection Scheduled for 2012
- Will be addressed through modeling initially, then assessed more directly if needed later

Notes:

a The different colors used for the arrows linking the boxes were selected to help distinguish the various linkages visually, and have no technical meaning.

b Differential exposure pathways exist for different life stages of some receptors (fish and amphibian eggs, larvae, adults). These will need to be considered/outlined in the final CSM.

c Upon death, receptor contributes, as solid-phase and liquid-phase detritus to the dietary, dermal, and incidental ingestion pathways...dietary is probably of importance

d Chemisorption onto external organic material

e Inhalation of COCs contained in media via Sweatlodge pathway

f Surface water may be affected by groundwater discharge from the side banks during pool drawdown.

g Porewater may be affected or replaced via groundwater advection.

h Includes mussels

i Thalweg refers to the pre-reservoir channel.

j The human health risk assessment will be performed by the EPA. This CSM represents the current understanding of the human health exposure pathways at the time the work plan was prepared. The human exposure media (biotic and abiotic) and pathways will be refined dependent upon the results of the planned Tribal Exposure Survey and more detailed input from the Spokane Tribes of the Colville Indian Reservation.

Pathways

Evaluating Exposure and Risk

CONTAMINANT SOURCES

Smelting operations in Trail, Canada are the primary source of metals contamination. Other contaminant sources include pulp and paper production in Canada. To a lesser degree other mining operations, atmospheric deposition, and unidentified sources may be sources.

CONTAMINATION

Contaminants from effluent (wastewater) and slag can move downstream and be trapped in sediment on the bottom, banks and beaches. They can also attach to fine particles that travel through the water column.

BIOACCUMULATION

Sediment contaminants can directly impact or accumulate in the tissues of worms, clams, insect larvae and other organisms (called the benthic community) that inhabit the lake bottom.

DIRECT CONTACT

Humans recreating and wildlife foraging on beaches may be directly exposed to contaminated sediments. Help protect your children from any contaminants by washing hands, face, feet and toys before eating and/or leaving the beach.

BIOMAGNIFICATION AND FOOD CHAIN

Organic contaminant concentrations (like PCBs) and mercury can biomagnify (increase) in the tissues of species as they move higher in the food chain, e.g.– stone fly, to fish, to wildlife or humans.

FISH CONSUMPTION

For fish species that accumulate contaminants in their tissue and organs, these toxic chemicals can move up the food chain to humans, birds, and other species consuming fish.

ADDITIONAL CONSIDERATIONS

BIODIVERSITY

Species that can not tolerate elevated levels of contaminants may die or suffer other adverse effects such as loss of reproductive functions. This can reduce the variety of species in the environment.

AIR

Contaminated sediments from beaches can be exposed and blown into the atmosphere via windstorms. Human inhalation of dust during these conditions is a potential human risk pathway.

SEDIMENT MOVEMENT

Sediment movement and accumulation is a natural, ongoing process. Flowing water, for instance, can erode, deposit and resuspend sediments. Over time this can change the distribution pattern of contaminated sediments, re-exposing more biota (plant and animal life) to potential toxic chemicals. This process can also result in uncontaminated sediments (e.g.—from bank erosion) covering contaminated sediments in a way that reduces the exposure of potential toxic chemicals to biota.

Related Activities

Legal Actions

In 2006, the Ninth Circuit Court of Appeals upheld a district court ruling that Superfund (CERCLA) law applies if it can be proven that hazardous releases from Teck's Trail smelter in Trail, Canada ended up in the United States (the Upper Columbia and Lake Roosevelt). The case began in 2004 with a suit filed by the Colville Confederated Tribes that the State of Washington later joined.

Related issues continue to work their way through the federal court system. Effectively, there are three types of issues ("complaints"). The first relates to penalties and fees, with the state and tribe contending that Teck should pay penalties and fees for not complying with the original enforcement order filed (and later withdrawn) by EPA. The Eastern Washington District Court in Yakima found against the Tribes and the state on the penalties, but awarded fees and costs. In June 2011, the Ninth Circuit upheld the District Court ruling on penalties. Specifically, the court held that non-EPA parties (e.g., the state and tribes) cannot bring a citizen suit to enforce the penalty provisions of an EPA unilateral cleanup order.

The second issue is who is liable for releases of hazardous substances released into Lake Roosevelt and the Upper Columbia River. The state and Tribes contend Teck is liable, while Teck contends others are responsible. In fall, 2010 lawyers from both sides filed "expert reports," a voluminous amount of documents that contain the opinions of various expert witnesses hired by each side to support their respective viewpoints. A trial date is currently scheduled for January, 2012.

The third issue is natural resource damages, which will not go before the court until the liability question is settled.

Natural Resource Trustees

Natural resource trustees (Trustees) are tribal, state, and federal agencies that manage natural resources on behalf of the public. Natural resources include, but are not limited to, land, vegetation, water, migratory birds, fish, species of concern and tribal resources. Trustees are responsible for the restoration of these resources when they are injured by the release or discharge of hazardous substances such as metals, dioxins, and/or oil. Injury to natural resources is defined as a measurable adverse change in the quality or viability of a resource as a result of a release of a hazardous substance. Examples of natural resource injury include death, disease, behavioral abnormalities, physiological malfunction, deformities, and fish consumption advisories.

The Upper Columbia Natural Resource Trustees Council was formed in May, 2007. The Trustee Council includes the Confederated Tribes of the Colville Reservation, the Spokane Tribe of Indians, the State of Washington, and the U.S. Department of the Interior. The Trustees follow a process known as Natural Resource Damage Assessment (NRDA), which is commonly conducted at Superfund sites by the Trustees and does not include EPA. Although conducted separately, coordination of RI/FS and NRDA activities is encouraged at Superfund sites. The Trustees believe integration of RI/FS and NRDA activities can expedite cleanup and restoration needs, thus benefiting the public in the long term.

Trustees can conduct an assessment of natural resource injury, quantify that injury, and determine what restoration of the injured natural resources is necessary. In the Coeur d'Alene watershed, for example, Trustees are restoring wetlands for migrating tundra swans that are injured (death) when foraging in contaminated floodplain habitats. These activities are being conducted in conjunction with EPA clean-up activities of floodplain habitats.

At Lake Roosevelt, the Trustees completed the first step of NRDA, the Preassessment Screen (PAS), in November, 2009. The PAS found that the prerequisites for proceeding with a more comprehensive evaluation of natural resource injury had been met. The Trustees now can develop an Assessment Plan to document and quantify injuries and identify possible restoration projects. The Assessment Plan process will include a public comment period prior to initiating any investigations of future restoration efforts.

An RI/FS for the upper Columbia River and Lake Roosevelt

In 2006, the United States reached an agreement with Teck Cominco (now called Teck Metals Ltd.) to conduct a Remedial Investigation and Feasibility Study (RI/FS) of Lake Roosevelt and the upper Columbia. EPA refers to this area as the Upper Columbia River (UCR) site. An RI/FS investigates the nature and extent of contamination and whether it results in a risk to people or the environment. It also, if needed, evaluates cleanup actions and other remedies.

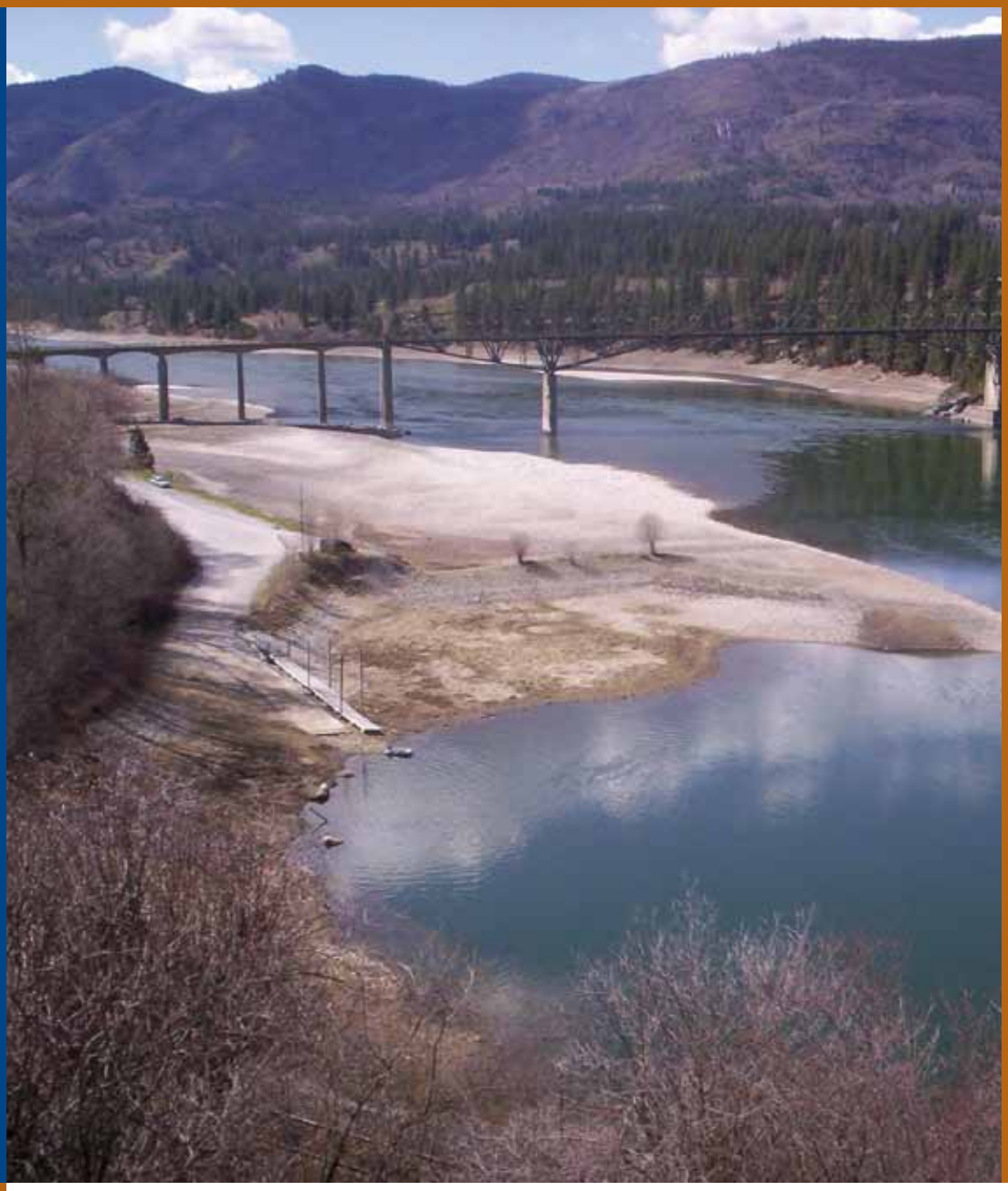
EPA oversees all Teck funded RI/FS activities to ensure that they meet standards set by Superfund law. EPA decisions are made with input by "participating parties." These include the Colville Confederated Tribes, the Spokane Tribe of Indians, the State of Washington (represented by the Washington Department of Ecology), and the U.S. Department of Interior. Interior agencies include the Bureau of Reclamation, the National Park Service, Bureau of Indian Affairs, the U.S. Fish and Wildlife Service, and the U.S. Geological Survey. Although not listed in the agreement, the Washington State Department of Health is also consulted.

Stay Informed

The easiest way to find more information is via the world wide web. Sites include:

- The Lake Roosevelt Forum: www.lrf.org, click on newsletters and the environment icon.
- The Environmental Protection Agency (EPA): http://yosemite.epa.gov/r10/cleanup.nsf/sites/UpperC.
- Teck: www.ucr-rifs.com
- The United States Geological Survey: http://wa.water.usgs.gov/projects/roosevelt/
- The Washington Department of Health: www.doh.wa.gov/fish
- Citizens for a Clean Columbia: www.cleancolumbia.org

EPA also maintains document repositories at Northport Town Hall, the Colville Public Library, Inchelium Tribal Resource Center, Nespelem Office of Environmental Trust, Grand Coulee Library, Wellpinit, and the Spokane Library.



Lake Roosevelt Forum Members

Area Residents and Communities

Bonneville Power Administration

Bureau of Reclamation

Ferry County

Lincoln County

National Park Service

Spokane Tribe of Indians

Stevens County

Washington Department of Ecology

Lake Roosevelt Forum

Committed to the environmental and economic well being of our communities

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