

Citizens for a Clean Columbia

Our mission: to advocate for a clean Columbia River ecosystem
NEWSLETTER JANUARY 2021

Who are we?

Citizens for a Clean Columbia (CCC) is a volunteer organization focused on advocating for the health of the Upper Columbia River (UCR) and Lake Roosevelt. Visit us on our website <https://citizensforacleancolumbia.org> or on Facebook <https://www.facebook.com/groups/315230442457913/> or contact us at citizensforacleancolumbia@gmail.com.

News in Brief

Baseline Ecological Risk Assessment Update

- Current activity includes results of the laboratory split sample data comparisons (sediment and porewater), steps involved in soil evaluation for plants and invertebrates, results of the plant study, and final work on the Toxicity Identification Evaluation (TIE).

Human Health Risk Assessment (HHRA)

- EPA finished their response to comments and the document is undergoing final review revision. An updated Public version, including appendices on tribal exposures should be available in February, 2021.

Soil Amendment Technology Evaluation Study (SATES): Phase III testing underway

- This study began with field testing on 1 of 4 plots that are high in soil lead using soluble phosphate liquid. The remaining amendment applications could not be completed due to weather.
- The remaining amendment applications will occur in Spring 2021. Sample collection should be completed in 2022 and results available in 2023.

Soil Removal Action in Northport Completed

- Removal action was completed on 15 properties in Northport.

Technical Advisor Update

- Joe focused on the HHRA, the TIE pilot study, Phase 3 sediment toxicity study, and SATES.

Baseline Ecological Risk Assessment

The BERA is an appraisal of actual or potential effects of a hazardous waste site on plants and animals other than people or domesticated species. For general information see EPA website: <https://www.epa.gov/sites/production/files/2015-09/documents/v1no2.pdf>. A review of the BERA Phase III activities can be found in our January 2019 newsletter located on the CCC website.

Split Samples: The phase 3 sediment study characterizes the nature and magnitude of risks posed to benthic organisms through exposure to contaminated sediment and porewater in the UCR Upper Reach Operable Unit. Sampling locations within Deadman's Eddy, China Bend, and Evans were developed using sediment bed (facies) maps from the 2018 sediment facies mapping program to define target strata for sampling. Strata were sand, mixed coarse, mud, and course sediment.

The purpose of the inter-laboratory split sample analysis was to assess reproducibility of chemical analyses and laboratory performance by conducting analyses by both TAI's contracted laboratory, ALS Environmental, and EPA's regional laboratory, MEL, on a randomly selected group of laboratory split samples. Split samples were obtained from 7 of 105 sediment samples (6.7%) and 17 of 122 porewater samples (14%). The laboratory split sediment samples were analyzed for TAL metals, including mercury and the split porewater samples were analyzed for dissolved TAL metals without mercury.

All sediment and porewater sample transport, holding times and preparation met laboratory requirements for this project. No qualification of

sediment data for metals or mercury was required based on calibration or calibration verification. However, for the results for dissolved zinc and dissolved iron in porewater, the recovery of the second-lowest calibration standard was outside the accepted limits of 90 to 110 percent at 113% for zinc and 117% for iron. The Minimum Reporting Level (MRL) of the method is verified on each day of analysis by including it as the low point on the calibration curve, and/or by measuring it as a QC standard. All calibration verification MRL checks met the frequency and recovery criteria on the day of analysis, except for dissolved beryllium in porewater which was outside the acceptance limits of 90-110 percent at 89% in one continuing calibration verification standard.

Duplicate analyses, including Matrix Spike/Matrix Duplicate Analyses, were performed for TAI metals on one sediment sample, mercury analyses on two sediment samples, and porewater analyses for dissolved TAI metals on one porewater sample. Matrix spike analyses are conducted by processing a sample with a known level of a contaminant such as lead along with the other samples to observe any interference within the sample or recovery of that contaminant. Spike results were within the 70-130 percent recovery requirements for all samples, except for three TAI metals on the sediment sample - potassium with a matrix spike recovery of 66%, chromium with a matrix spike recovery of 68%, and antimony with matrix spike recoveries of 18 percent/8 percent.

Soil Evaluation: In September, Teck distributed its report for comments on Steps 1 through 6 of the UCR Soil Evaluation for Plants and Invertebrates.

- Steps 1-3 compare site soil metal concentrations to U.S. Environmental Protection Agency (EPA) ecological soil screening levels for plants and invertebrates (USEPA 2016) or to soil screening

levels (SSLs) developed for this site for metals without Eco-SSLs. For locations with metal concentrations exceeding Eco-SSLs or SSLs, site soil concentrations are compared to background soil concentrations.

- Steps 4 and 5 summarize the findings for each metal by location, characterized by soil concentrations as less than Eco-SSLs or SSLs, greater than Eco-SSLs or SSLs but less than background, or greater than both Eco-SSLs or SSLs and background.
- Step 6 compares soil concentrations to bioavailability-adjusted effect concentrations. This is done to take into account soil properties such as pH or clay content that can affect the amount of total metal that is bioavailable to an organism for uptake or adsorption across its cellular membrane, thereby determining its toxicity. To do this, a Threshold Calculator (ARCHE 2017) is used to predict toxicity of a particular soil sample based on the total metal concentration and the relevant soil bioavailability properties.

Soil data were collected as composite samples during the 2014 UCR upland soil study. A total of 142 locations were sampled in aerial deposition areas (ADAs) of approximately 25 acres. Excluded from consideration were soil samples from studies of residential and commercial areas or specifically completed for the HHRA; these were the LeRoi removal action study, two residential soil studies, and the 2018 plant tissue study. Also excluded were older studies and the Bossburg Flat beach study that focused on the area near the Young America Mill known to be lead contaminated.

TAI conducted an assessment for the area in and around the Site (Exponent and ERM 2020) to ascertain natural background soil concentrations using the lowest background threshold values (BTV)

calculated for arsenic, chromium, molybdenum, and selenium as a conservative approach.

Steps 4/5 found exceedances for copper, lead and zinc for plants in some areas and copper and zinc for invertebrates in some areas. Also remaining considering lack of bioavailability information are arsenic, manganese, and selenium plants in some areas and manganese for invertebrates in some areas.

The next steps will be:

- Step 7 to evaluate the potential need for and performance of focused studies which, based on Steps 1 to 6, are not likely needed.
- Steps 8 and 9 will include the weight of evidence and uncertainty evaluations. These final steps will result in conclusions about baseline ecological risks posed to plants and invertebrates from metals present at the Site.

Toxicity Identification Evaluation (TIE): The TIE was intended to be used to determine the cause(s) of biological effects (sediment/porewater or overlying water or both) in the Phase 3 sediment study using an ion exchange resin. This study was terminated in November 2020 and CCC is reviewing the project summary and will provide comments to EPA in January 2021 and a summary of the findings in our next newsletter.

Mindy Smith, CCC secretary

Human Health Risk Assessment (HHRA)

An updated version of the HHRA will be available soon for public comment and we urge all of you to read the report and consider how the document might be improved. EPA received few comments on the last version of the report and this will be the final opportunity for public comment.

The purpose of the HHRA is to calculate risk for hypothetical groups including resident, worker, recreational visitor, and tribal populations; evaluate exposure to chemicals from various sources (food; air; touching or accidental ingestion of soil, sediment and river water); estimate risks using measured concentrations of chemicals in soil, public beaches, and the river; and compare estimated risks to benchmarks to see if they are of concern.

The findings are summarized in our January 2020 newsletter available on our website. The draft [Human Health Risk Assessment](#) is available on EPA's website:

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

If you have questions about the HHRA please contact [Robert Tan](#) at: (206) 553-2580. Also, feel free to email me if needed; best address is smithm69@msu.edu.

Mindy Smith, CCC secretary

SATES Phase III testing underway

Teck and the technical team, under EPA oversight, are now entering Phases 3 and 4 of the Soil Amendment Technology Evaluation Study (SATES). This study is designed to identify and field test soil amendment technologies that could cost-effectively reduce the long-term potential for human exposure to lead in UCR shallow upland soils. Phase 1 (Test plot characterization [2014] - to obtain baseline data on the plots to be tested - and amendment alternatives screening) and Phase 2 (Bench-scale treatability testing in the laboratory) have been completed. The results of these studies were presented in our newsletters from January 2020 and July 2020. Phase 3 is for test-plot field-scale pilot testing, and Phase 4 is for monitoring those test plots once the amendments have been applied.

Phase 3/4 testing will inform us about effectiveness in reducing bioavailability of lead in soil and feasibility of amendment application. In addition, the study team will measure changes in key soil chemical and physical properties and in plant diversity and density. The test plots are located on Confederated Tribes of the Colville Reservation (CCT) tribal allotments. Four subplots are located within each test plot to allow for evaluation of each of the three amendments and a control subplot.

The three soil treatment amendments are: soluble phosphate, an organic compost-enriched potting soil, and combination soluble phosphate and biochar. Each of the selected soil treatments will be applied to one of the three subplots within a test plot, maintaining the untreated subplot as a control. The SATES process, including selection of the amendments, has been very open and CCC, along with many other stakeholders, were able to provide input using a multicriteria decision model.

Phase 3 application of amendments was to begin in the fall of 2020. Unfortunately, due to permit issues, the study started in November with application of amendments completed on only one plot.

Amendment application on the remaining three plots was postponed until spring due to inclement weather. This raised a number of concerns. Joe observed the first day of amendment application and had a number of concerns, covered in his report. In summary, an all-new team unfamiliar with the area conducted the study without the presence of oversight, some of the soluble phosphate did not dissolve and the potash, used to control the pH, did not dissolve at all, and the amendment was sprayed into the buffer zone and adjoining subplot. The latter will make it impossible to do control sampling from the buffer zone. Additional concerns were raised by the Washington Dept. of Ecology regarding interpretation of results with such wide spacing of

amendment application suggesting consideration of another plot to be the 4th plot next spring.

Following the remaining amendment application in Spring 2021, monitoring of the test plots will include periodic soil sample collection and analysis by the study team and vegetation monitoring by the CCT. Monitoring will continue through approximately October 2023 – three times during 2021 and at least twice (spring and fall) during 2022 and 2023 or until the SATES technical team determines that changes in percent IVBA lead and arsenic in surface soil have become asymptotic (at it's mathematical limit). Soil will be sampled using incremental composite sampling methods and analyzed for a number of parameters including total and bioaccessible lead and arsenic, electrical conductivity, pH, and total target analyte list metals, excluding mercury. Vegetation growth and health will be determined using a combination of measures such as percent cover, density, species richness, and diversity, and will be scheduled to occur in advance of each soil sampling event to avoid disturbance of the vegetation.



Photo provided by Joe Wichmann

Mindy Smith, CCC secretary

Soil Removal Action in Northport

Information about the history of the Northport smelter and the 2004 property evaluation and clean-

up by the EPA is provided in our January 2020 newsletter. Clean-up occurred on properties containing soil lead concentrations of 1000 ppm. Of the properties sampled, those with lead levels less than 1,000 ppm were not offered soil cleanup. Instead, residents were advised to reduce their exposure to the contaminated soil.

Areas for the 2020 soil removal were identified based on an October 2019 review of 2004 data reports of properties within Northport town limits with lead levels near or above 700 ppm. The threshold of 700 ppm is the same level EPA used when working with Teck American to clean up 18 residential properties outside of Northport town limits from 2015 – 2018 in response to the 2014 and 2016 residential soil studies. Use of this lower threshold represents advances in scientific understanding of the adverse developmental effects of lead to young children and babies.



Photo's provided by Monica Tonel

The U.S. EPA cleaned up the soil on 15 properties within Northport town limits. With consent of

property owners, the cleanup at residential properties and common use areas began on August 3, 2020 and was completed on September 25, 2020. Common use areas included the Lyn Kaste Gould Memorial Park, the lawn at the Northport Community Library, the play area at the Northport Community Garden, the lawn at the Northport American Legion vacant lot, and the lawn at the Northport Welcome Center.

EPA contractors replaced contaminated soil with clean soil in close coordination and communication with property owners. EPA controlled dust by spraying water and monitoring the air to ensure dust suppression was effective. Following the removal action, the EPA On-scene Coordinator conducted a walk-through with each property owner or representative to describe the excavation, backfill, and restoration work.

Monica Tonel

Technical Advisor Report

My efforts over the past six months focused on the site-wide HHRA, the TIE pilot study, the Phase 3 sediment toxicity study and the SATES.

Online public meetings can pose a daunting challenge. The July 15, 2020 HHRA webinar was not as well attended as the June 10, 2020 webinar and fewer questions were asked during this webinar. The revised HHRA including the tribal appendices is expected to issue soon.

The TIE pilot study was terminated in November 2020. A project summary is currently out for review with comments due January 15, 2021.

I reviewed the Phase 3 Sediment Study Inter-Laboratory Split Sample Chemistry Comparison/Evaluation and provided comments to CCC in July. My main concern was the poor agreement on chemistry data for sediment samples

obtained using the freeze grab sampler. I suggested that future studies using a freeze grab sampler consider each sample to be a discrete sample. If samples are to be combined, I suggested that a rigorous homogenization procedure be followed. I also suggested the data summary tables include a column indicating the type of sampling equipment used to obtain each sample. CCC has not received a copy of the final report.

Several portions of the Phase 3 sediment toxicity study have been completed. The technical memorandum on the backscattered scanning electron microscopy (BSEM) determination of slag percent in selected sediment samples issued in November 2020. It will be included as part of the sediment chemistry data summary report. The sediment facies mapping data summary report issued in September 2020 and is available on the Upper Columbia River Project site (<http://www.ucr-rifs.com/>).

I observed control water and soluble phosphate (SP) amendment application on SATES decision unit (DU) 258-3 on November 11, 2020. I learned that the DU was the site of a hunting camp with two recreational vehicles when the team arrived the previous week. A fire ring was located on the boundary of two of the subplots. I was the only observer scheduled to attend the field program; no representatives from EPA or any of the participating parties were scheduled to observe.

I was concerned that winter weather conditions might hinder the program, especially since the sediment facies mapping field program was stopped on November 10, 2018, due to unsafe field conditions. When I arrived, the DU was covered with approximately 2 inches of snow except where water had been applied on the control subplot on November 10, 2020. That area had a light, partially-melted snow cover. Activities during the first half of

my observe day were devoted to completing application of water on the control subplot and water on the compost subplot. Even though the ground was snow-covered, there was very little ponding of water at the application rate used and most water was absorbed into the soil.

The second half of the day was devoted to application of SP. The SP subplot was divided into four quadrants, each to receive one quarter of the total SP amount. This made mixing easier and application more uniform than trying to apply the entire amount over the subplot at one time. SP application for the entire subplot consisted of 645 pounds of triple super phosphate ($\text{Ca}(\text{H}_2\text{PO}_4)_2$) (TSP) and 43 pounds of potash (KCl). The first quadrant used one quarter of these amounts, which was dissolved in four portions in a 35-gallon trash can before being pumped into a 330-gallon tote. Stirring with a shovel proved relatively ineffective at dissolving the TSP. Recirculating water through the trash can using a sump pump with shovel stirring worked better. The potash was added to the last portion of TSP. Roughly 10 percent of the TSP and most of the potash remained undissolved and was applied by hand to the quadrant. The SP mixture in the tote was applied to the subplot quadrant using a sump pump and garden hose.

The snow cover allowed easy visualization of the application rate and placement of the SP. The SP was applied uniformly up to all four edges of the quadrant with some overspray into adjoining quadrants and the adjoining subplot. No attempt was made to taper the application rate in the 2.5-foot buffer zone with the adjacent subplot. The field team attempted to mix a second batch of SP for the second quadrant of the SP subplot; however, more than 25 percent of the TSP and almost all of the potash was left undissolved. Application was postponed to the next day when a drywall mud

mixer and possibly an immersion heater would be used to facilitate dissolution. On November 16, 2020, after all amendments had been applied to DU 258-3, the 2020 field plan was delayed until spring 2021.

I suggested to EPA that the SATES team determine if the QAPP and Field Plan should be followed as written, or if amendment application through the buffer zones up to adjoining subplots will be acceptable. I also suggested that at least one field crew member sight down subplot boundaries and communicate with the applicator to eliminate overspray in the future.

Joe Wichmann, PhD; CCC Technical Advisor

Want to be More Involved?

CCC welcomes new members. Our next General Member Meeting will be in the spring. Please join us. We will post updated information on Facebook (<https://www.facebook.com/groups/315230442457913/>). We also have new CCC T-shirts available that can be obtained through Hilary Ohm (hilary@highwaterfilters.com).



With questions for the EPA project managers, contact Robert Tan for information on human health studies at Tan.Robert@epa.gov and Kathryn Cerise for information on ecological studies at Cerise.Kathryn@epa.gov. Kira Lynch is responsible for the Soil Amendment Technology Evaluation Study (SATES) and can be reached at Kira.Lynch@epa.gov. Concerns may also be directed to the EPA assistant Region 10 Deputy Regional Administrator Michelle Pirzadeh (Pirzadeh.Michelle@epa.gov).

Mindy Smith, CCC secretary