Citizens for a Clean Columbia

Our mission: to advocate for a clean Columbia River ecosystem

NEWSLETTER JULY 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

- The 2019 phase 3 Data Summary Report to characterize the nature and magnitude of risks posed to benthic organisms through exposure to slag-impacted sediment & porewater is complete.
- EPA has recommended that the Toxicity Identification Evaluation be terminated.

Human Health Risk Assessment (HHRA)

- Following review and redacting by the EPA records center, the final, public version of the HHRA is available at: https://semspub.epa.gov/src/collection/10/SC32350. (see Technical advisor update for details)

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

- Amendment applications, postponed last fall due to inclement weather, were completed in April.
- Phase IV involves post-treatment monitoring and will continue for 3 years.

Opportunity for Additional Soil Sampling in Northport

- Funding is available through the EPA's Removal Program to sample additional residential properties in Northport that were not eligible for testing conducted by TAI in 2014-2016.
- EPA has sent letters to eligible property owners. If you believe that your property is eligible and have not received a letter, please contact Monica Tonel at tonel.monica@epa.gov or (206)348-2692

Northport Waterfront Cleanup Moves Forward

- The WA Department of Ecology has now posted responses to comments made during the public comment period which closed June 2.

CCC Joins Tribes in Grant Application

- CCC has Joined with the Confederated Tribes of the Colville Reservation and Spokane Tribe of Indians to Apply for an Environmental Justice Grant to establish local air monitoring.

Technical Advisor Update

- Joe focused on the site-wide HHRA, the phase 3 sediment toxicity study, and the SATES.

Baseline Ecological Risk Assessment

A BERA is an appraisal of actual or potential effects of a hazardous waste site on plants and animals other than people or domesticated species (under current and future conditions). The study identifies specific ecological communities or species where contaminants of concern present unacceptable risk.

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 coarse sediment.

Evan's campground image from nps.gov

The primary study question was if elevated metals concentrations associated with slag deposits pose unacceptable risk to benthic organisms living in this area. The organism studied was *Hylella azteca* (*H. azteca*), a 1/8- to 1/4-inch-long crustacean commonly found in lakes, ponds, and streams throughout North America. They are an important link in the aquatic food chain and a food source for fish and various other invertebrates.

Image from BugGuide.net

There were also many specific study questions related to the central question that can be found in the report. Multiple lines of evidence were used to answer the study question. These lines of evidence, called the sediment quality triad, consisted of whole sediment and sediment porewater chemistry, whole sediment laboratory toxicity tests, and *in-situ* benthic macroinvertebrate (BMI) community structure in the three areas of interest noted above. Sediment, *in-situ* porewater samples, and BMIs were collected from each of the 3 areas of interest and from 18 reference locations in the Columbia River in Canada between September 10 and October 23, 2019. In June and July, 2020, *H. azteca* bioassays were performed using field sediment from each area and recording 28- and 42-day survival, weight and biomass; reproduction was evaluated from the 42-day tests. Replicate test chambers were set up for testing sediment and porewater chemistry on Day 7 and Day 21. Sampling locations for the 42-day *H. azteca* bioassay testing included 40 locations within the 3 areas of interest and 17 reference locations. The 42-day *H. azteca* bioassays were performed using a 28-day static-renewal exposure of 7- to 8-day-old *H. azteca* to sediments, followed by a 14-day exposure to water, during which only reproduction was evaluated. Each testing batch included one lab control sediment sample (Spring River sediment) and one auxiliary control sediment sample (quartz sand), to provide similar physical conditions as coarse samples from the UCR. For the 42-day bioassay test acceptability assessment, acceptability criteria relating to survival of *H. azteca* in control sediment was set at $\geq$80%.

Detailed data on the 33 sediment, porewater, and BMI community sampling locations within the 3 areas of interest; location of samples of mixed coarse, mud, and coarse strata in the areas of interest; and 18 reference sample locations for sediment, porewater, and BMI community sampling are detailed in the report text, tables, and maps.

Sampling locations were accessed by boat, located using GPS software, and verified for target strata using underwater video. Overall, there were 87 bulk sediment samples, 104 in situ porewater, and 85 BMI samples collected from 106 locations within three areas of interest and 18 sediment, in-situ porewater, and BMI samples from 18 upstream

reference locations in Canada. There were 40 locations where the target strata did not match surface sediment as observed by underwater camera, even after repositioning. In these cases, an alternate location with the same target strata was successfully sampled with the except of the mixed coarse and coarse strata at Deadman's Eddy, as noted below. For areas not accessible by boat, sediment samples were collected using stainless steel hand tools. When sand samples could not be obtained using a mechanical grab sampler, sampling locations were revisited using the freeze grab sampler.

Results: Field sampling was carried out in conformance with the Phase 3 Sediment Study QAPP and EPA-approved field change requests. Refusals and low sample volume due to coarse substrates and mismatches between observed facies and target strata were the primary reasons not all targeted locations were successfully sampled. In some cases, after visiting all primary and alternate locations within an AOI, the target number of samples per stratum could not be obtained.

The final number of Site locations successfully sampled was 106, two fewer than the target of 108. A summary of successful samples for each media type targets is provided below.

- **Sediment.** Sediment was collected from 87 (97%) Site locations (target of 90) within the three sampling locations, and from all 18 reference locations. Sufficient volume for possible use in 42-day *H. azteca* bioassays was obtained from 99% (71/72) of mud, sampleable sand, and repeat sample locations and did not limit the final number of samples selected for bioassays. Sufficient sediment volume for 42-day *H. azteca* bioassays was collected from all reference locations.
- **Porewater.** Porewater was collected from 104 Site locations (96%), including 17 (94%) from porewater-only locations Field porewater was successfully collected from all 18 reference locations.
- **BMI.** BMI were collected from 85 (94%) Site locations (target of 90) within the three sampling locations and from all 18 reference locations.

While there are many results, I will summarize some of the key findings. Data based on the draft final version of the DSR, field-collected sediment showed a mean of arsenic of 14.6 (range 1.11 to 80.5) and lead 367 ppm (range 12.1 to 5520) compared to the reference samples of arsenic 2.05 (range 0.66. to 9.5) and lead 11.6 ppm (range 3.5 to 59.1). The 42-day sediment summary statistics for homogenized bulk sediment were mean 14.9 (maximum 77.6) for arsenic, mean 996 (max 2740) copper, mean 442 (max 5920) lead. Field-collected porewater results showed a mean of 3.6 (max 54.4) for arsenic, mean 4.6 (max 95) copper, mean 2.19 (max 3.86) copper, and mean 0.21 (max 1.35) lead.

BMI community metric results for the 3 locations were obtained using conventional and freeze grab samplers at two filter sizes (250 and 500 µm) and for the reference location using conventional samplers. Results for total density using the 250 µm filter and conventional sampler were mean 3,610 (maximum 17,800) for Evans, mean 4,860 (max 15,700) China Bend, mean 3,870 (max 39,400) Deadman's Eddy, and mean 7,770 (max 39,600) Reference location.

Batch 1 mean survival of *H. azteca* bioassays at day 42 ranged from 81-93% from 3 China Bend samples, 31-86% for 5 Deadman's Eddy samples, and 73-96% for 4 Evan's samples with 7 Reference location samples having 74-100% survival. The negative control from Spring River sediment showed 90% survival while the quartz sand auxiliary control had only 63% survival. **Batch 2** mean survival of *H. azteca*

bioassays at day 42 was from 81% and 89% from 2 China Bend samples, 30-58% for 4 Deadman's Eddy samples, and 73-85% for 4 Evan's samples with 6 Reference location samples having 74-94% survival. The negative control from Spring River sediment showed 88% survival while the quartz sand auxiliary control had only 46% survival. **Batch 3** survival of *H. azteca* bioassays at day 42 ranged from 55-91% from 4 China Bend samples, 19-83% for 5 Deadman's Eddy samples, and 84-88% for 3 Evan's samples with 6 Reference location samples having 84-91% survival. The negative control from Spring River sediment showed 84% survival while the quartz sand auxiliary control had only 69% survival. Weight, biomass, and number of offspring were also measured.

CCC provided comments on the draft document in February 2021, which included a request for discussion of the impact on overall data quality of the high percentage of porewater concentrations qualified as non-detected due to blank levels of dissolved aluminum (62%), antimony (24%), chromium (99%), copper (36%), lead (54%), nickel (54%), thallium (25%) and zinc (68%); the high percentage of sediment concentrations qualified as estimated due to matrix spike levels of antimony (51%), chromium (31%), lead (31%), sodium (31%) and sulfide (45%); the high percentage of sediment concentrations qualified as estimated due to post digestion spike levels of cadmium (31%) and silver (31%); the high percentage of sediment concentrations qualified as estimated due to laboratory duplicate levels of arsenic (31%), sodium (31%) and SEM cadmium (24%); the high percentage of sediment concentrations qualified as estimated due to serial dilution levels of antimony (22%), barium (31%), cadmium (31%), silver (31%), SEM cadmium (22%) and SEM lead (31%); the high percentage of bioassay porewater concentrations qualified as non-detected due to blank levels of aluminum (30%), chromium (92%) and zinc (36%); and the mean survival, mean weight and mean reproduction data for the quartz sand control groups.

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. EPA has determined that it is unlikely that robust and reliable methods could be developed that would meet data quality objectives for a TIE study or for the Phase 3 sediment study. They recommend that TAI discontinue the TIE program and drop any plans for its use the RI/FS.

Mindy Smith, CCC secretary

SATES Phase IV testing underway

The SATES 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 (see newsletters from January 2020 and 2021 and July 2020 for details). 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. The three soil amendments selected are: soluble phosphate, an organic compost-enriched potting soil, and combination soluble phosphate and biochar.

Phase 3 application of amendments began in fall of 2020. Unfortunately, due to a late start, amendments were completed on only one test plot. In April, 2021, amendment application on the remaining three plots was completed. Joe

Wichmann, CCC's technical advisor, observed amendment application to DU 401-2, and noted that the project was performed as well as possible under field conditions with fairly even application of compost but less even distribution of biochar.

Soluble phosphate being added to the tote with the commercial electric mixer and application of mixture Photo by Joe Wichmann

Monitoring of the test plots will include periodic soil sample collection and analysis by the study team and vegetation monitoring by the CCT from 2021 to 2023 or until the SATES technical team determines that changes in percent IVBA lead and arsenic in surface soil have reached its mathematical limit.

Mindy Smith, CCC secretary

Opportunity for Additional Soil Sampling in Northport

Robert Tan from the EPA informed CCC that there is funding available through EPA's Removal Program to sample additional properties that fall into the Northport exclusion area. This includes Northport town proper and the areas just outside of town. An estimated 47 property owners have been notified and offered soil testing. Monica Tonel will be heading up the project. The EPA is currently working on acquiring funding for any needed critical action removals, set to occur with soil lead levels of 700 ppm or higher.

If you believe that your property is eligible and have not received a letter, please contact Monica Tonel at tonel.monica@epa.gov or (206)348-2692.

Mindy Smith, CCC secretary

Northport Waterfront Cleanup Moves Forward

The Washington Department of Ecology (DOE) is directing and funding a remedial investigation and cleanup of smelter-related metals contamination on Northport's Town Park and boat launch waterfront area. Metals most frequently found throughout the site at levels posing a risk to human health and the environment are copper, lead and zinc. Funding for this project comes from the Eastern Washington Clean Sites Initiative. Information on this project can be accessed at: https://apps.ecology.wa.gov/gsp/Sitepage.aspx?csid=14874.

Photo from ecology.wa.gov as noted above

A draft remedial investigation and feasibility study was conducted and the document posted for public comment on May 3rd, 2021. In addition, DOE conducted an online public meeting on May 19th. Following the month-long comment period, DOE has now posted their responses; these can be downloaded from the above link. Comments were received from 3 individuals and one organization. Some of the comments related to a decision to remove some soil vs. capping, safety concerns, the scope of the project (e.g., the boundary set for cleanup), the source of clean fill and capping material, potential impact of truck traffic during cleanup, monitoring following cleanup, and whether the benefit of side channel construction in Alternative 2 warrants the additional expense.

Ecology's Toxics Cleanup Program has begun working on a draft Cleanup Action Plan and will consider all comments as this is completed. A public comment period will follow release of this document, expected late this year or early 2022.

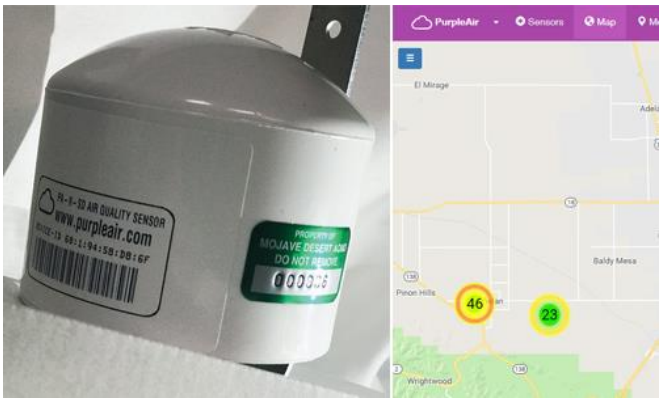
Mindy Smith, CCC secretary

CCC Joins Tribes in Grant Application

CCC has Joined with the Confederated Tribes of the Colville Reservation (CCT), serving as the Applicant, in partnership with the Spokane Tribe of Indians (STI) and the University of Washington, to apply for an Environmental Justice Grant to establish air monitoring in the Upper Columbia River and Lake Roosevelt - extending from the US-Canada border near Northport, Washington to the confluence of the Columbia and Spokane Rivers. The project combines CCT and STI environmental and air-quality expertise, CCC's human health and environmental expertise, and the air-monitoring expertise of Dr. Dan Jaffe, a Professor in the Department of Atmospheric Sciences of UW, Seattle.

Due to uncertainty regarding air pollution hazards in the region, including wildfire smoke, industrial smokestack emissions, and dust storms, and in the absence of adequate air monitors within this 100-mile corridor, we hope to acquire grant funds to establish air monitors.

If funded, project leaders will work with local community members, both tribal and non-tribal, to determine regional internet access possibilities and recruit air monitor hosts. The project team would install a network of 52 consumer-grade PurpleAir $PM_{2.5}$ monitors with application of a dust analysis to provide real-time data during smoke season, with application of correction equations to provide data regarding the frequency, intensity, and location of high-$PM_{2.5}$ events due to dust storms or industrial emissions. These data would be merged with data throughout the country, available on the AirNow website (https://www.airnow.gov).



Purple air monitor and map portion
Image from https://www.mdaqmd.ca.gov

Through the communication channels of all partners, we will disseminate relevant data interpretations and provide education to allow regional residents to make informed choices about their activities during times of high air pollution. This project will address current disparities and empower local residents to take control of decisions that directly influence their health.

Mindy Smith, CCC secretary

Technical Advisor Report

The final HHRA posted to the EPA website (https://cumulis.epa.gov/supercpad/CurSites/cscdocument.cfm?id=1002171&doc=Y&colid=32350) on February 10, 2021. The 17 appendices plus public comments and EPA responses to public comments is available for download as a single file with no table of contents. I suggested on several monthly calls with EPA that a table of contents for the HHRA files be included on the website. EPA recently agreed and a table of contents is currently being added.

I reviewed the draft Phase 3 Sediment Study Data Summary Report (DSR) and provided comments to CCC in January 2021. My major concern was the omission of quartz sand control bioassay results from the text of the report. Test organisms performed much poorer in the quartz sand controls at Pacific Eco Risk (PER), the study laboratory, than at the U.S. Geological Survey Columbia Environmental Research Center (CERC) laboratory. This discrepancy confounds interpretation of the toxicology results for the study. An additional concern was the relatively large number of analytical results with estimated results. I suggested this issue be specifically addressed in the report. The final draft of the DSR addressed these concerns.

I reviewed the Phase 3 Sediment Study Inter-Laboratory Split Sample Bioassay Comparison and Evaluation memorandum and provided comments to CCC in June 2021. I had only a few editorial comments. I thought the differences between the PER and CERC results were well presented and discussed. The primary conclusion of the memorandum was that PER bioassay results may be useful for identifying locations that are potentially toxic due to site-related contaminants, but the occurrence and magnitude of toxicity appears to be uncertain.

I observed field amendment application for the SATES study in April 2021. Major improvements to the procedure for applying soluble phosphate were made since October 2020. The field team was doubled, which allowed for the simultaneous application of two amendments. All equipment was well maintained and in good operating condition. The use of a 1-horsepower commercial tote mixer appeared to work well for disaggregating the triple super phosphate and creating a homogeneous mixture for application. The use of a ¾-inch hose without a nozzle eliminated the possibility of clogging if there were any small pellets remaining in the tote. A similar process for disaggregating the potash would have been beneficial. Compost application appeared to be as even as possible under field conditions. The biochar seemed to be very difficult to apply evenly. It was applied from

five-gallon buckets in a number of small clumps. Overall, amendment application was performed as well as possible under field conditions. I do not think that the study goals were compromised by the amendment application challenges. I also observed post-amendment application incremental composite soil sampling in May 2021. Sampling was very consistent, as the same field team member removed overlaying duff and collected all soil samples. Analytical results should be available soon.

I reviewed the SATES bench scale study data summary report and provided comments to CCC in July 2021. My only concern was the lack of a table listing the analyses that could not be validated using published EPA validation guidance documents.

The draft upland baseline ecological risk assessment is currently under review. No firm date for comments has been set.

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 Risk Assessment or Soil Amendment Technology Evaluation Study (SATES) at Tan.Robert@epa.gov and Bonnie Arthur for information on ecological studies at Arthur.Bonnie@epa.gov. Concerns may also be directed to the EPA Region 10 Deputy Regional Administrator Michelle Pirzadeh (Pirzadeh.Michelle@epa.gov).

Mindy Smith, CCC secretary