UVic Sustainability Scholars Program

Final Report

A Community Toolkit for Air Pollution Investigations

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Date: August 15, 2025

Executive Summary

This reflection summarizes my summer internship with Research for the Front Lines (R4FL) through the UVic Sustainability Scholars Program. It focuses on project scoping, collaborative process, key learnings, challenges, and outcomes. The confidential technical details and step-by-step procedures I produced for R4FL are intentionally excluded; those live in a separate toolkit delivered to the organization. What follows documents how I worked and what I learned so my contributions are visible and accountable without disclosing sensitive content.

Acknowledgement of Place and Positionality

I completed this internship remotely from the unceded, ancestral lands of the Stó:lō peoples (Stó:lō Nation) - S'ólh Téméxw, otherwise colonially known as Chilliwack, British Columbia.

As a settler working with Research for the Front Lines, I am very appreciative to have had the opportunity to learn about R4FL's community-led research practices. Early on I learned that R4FL works differently: front-line communities set the questions and make the decisions, and staff and volunteers support that direction. R4FL serves communities who are directly and disproportionately impacted by climate change and/or the systems and industries causing it.Hearing about R4FL's work with Indigenous communities was grounding. This project is only one small piece of R4FL's wider work, but I'm excited by its potential to be built on in good ways and potentially put to use by communities.

Introduction: Purpose and Boundaries of this Reflection

My project with R4FL aimed to make community-led air-quality investigations more accessible. The original posting called for a synthesis of air-sampling methods, equipment options, and laboratory pathways. This reflection describes how I translated that broad scope into a feasible, community-focused toolkit and what I learned along the way. As someone without a formal environmental or science background but eager to build my knowledge, I narrowed the scope, with guidance from my mentor, Marcia, to a pathway appropriate to my stage of learning while still addressing the spirit of the posting's research questions. The posting explicitly encouraged Scholars to adapt scope to their expertise and interests, which made that choice possible. Because the toolkit contains confidential links and may be built on and integrated with other R4FL projects, the final deliverable is not being shared publicly; instead, this report provides a high-level overview of its aims, structure, and development process.

Why I narrowed to VOCs (BTEX) and evacuated, passivated canisters

Early on, I had to choose an investigation pathway that a first-time community investigator could realistically carry out and that labs across Canada would recognize. I focused on volatile organic compounds (VOCs) with a focus on BTEX (benzene, toluene, ethylbenzene, xylenes) because they are commonly associated with industrial activity, are analyzed widely by commercial labs via standardized methods, and a single whole-air canister can screen dozens to hundreds of VOCs from one capture.

I selected evacuated, passivated stainless-steel canisters (Summa/Silonite-type) as the core collection tool because they support quality whole-air captures, require no field power, and can be configured for grab or time-integrated durations using a flow controller useful for both event-driven and planned investigations.

In short, narrowing to this approach gave me one straightforward pathway I could learn and share: plan an investigation around the community's goal, take a whole-air canister sample on timing that fits the purpose, and work with an accredited lab for routine canister-based BTEX analysis.

Method and Process

The development of the toolkit followed a clear process that combined research, guidance from my mentor, and careful knowledge translation. My approach centered on three main components:

(1) Focused review of public and R4FL materials. I reviewed and read documents pertaining to:

- Process: high-level investigation steps and simple high quality sampling;
- Planning: site selection, timing/seasonality, documentation;
- Lab coordination: requests, chain-of-custody, shipping, and reporting.
- Alongside public guides and lab pages, I reviewed R4FL materials and collected resources (previous research, case examples, and community toolkits) to align with current practice.

(2) Biweekly mentorship. I met regularly with my mentor, who provided oversight and shared resources from R4FL's volunteer network. These conversations included talking about feasibility, surfaced likely pitfalls for new users, and kept the work aligned with front-line priorities.

(3) Knowledge translation. I developed the structure and tone of the toolkit, drafting and refining the content to meet the project's goals. My main contribution was translating technical procedures and steps for taking a high quality sample into plain language so communities understand both what to do and why it matters. I also created practical planning guidance, decision tables, and appendices with chain-of-custody forms, field log templates, and provincial BTEX detection.

What's Out There and Where I Saw Gaps

When I scanned open resources, I noticed a pattern.

- Canada has strong regulatory monitoring led by the National Air Pollution Surveillance (NAPS) program and guided by intergovernmental standards.[1] These are important, but they are designed for formal networks rather than community-run investigations.
- There are citizen-science and advocacy resources, such as the *Toolkit for Citizen Activists* (David Suzuki Foundation)[2], *Air Sampling Guidebook* (Community Health

[1] Canadian Council of Ministers of the Environment. *Ambient Air Monitoring and Quality Assurance/Quality Control Guidelines (NAPS).* Environment and Climate Change Canada, 2019. https://ccme.ca/en/res/ambientairmonitoringandqa-qcguidelines_ensecure.pdf

[2] David Suzuki Foundation, *Tool Kit for Citizen Activists*, October 2017, https://davidsuzuki.org/wp-content/uploads/2017/10/Tool-kit-for-citizen-activists-PDF.pdf.

Centers[3]), *When the Wind Blows* (Coming Clean)[4], and ELAW's *Guide to Collecting Environmental Samples*[5]. While useful, these tend to be broad overviews, project spotlights, or general environmental sampling guides rather than step-by-step, Canada-specific instructions for outdoor VOC canister sampling.

My takeaway: I did not come across open, Canada-specific, community-led resources for VOC canister work that combine plain-language steps with guidance on collecting high quality air samples. Many references are either focused on regulatory networks or adapted from U.S. community environmental-justice contexts. This is the gap my toolkit aims to help address.

Learning from a Case Touchstone: Chemical Valley (Aamjiwnaang First Nation)

What happened:
Aamjiwnaang First Nation, located in Ontario's "Chemical Valley," lies adjacent to dozens of petrochemical plants. Residents face persistent exposure to high levels of pollutants like benzene, which can cause cancer and other health impacts.[6] In April 2024, benzene levels spiked so dangerously that the community declared a state of emergency due to acute health risks.[7]

Sample evidence:
Earlier evidence from a community-led bucket brigade revealed alarming concentrations of reactive chemicals, including benzene, ethylbenzene, and chlorobenzene, even on days that seemed "safe."[8]

Takeaways for my project:

- **Preparation for emergencies.** The toolkit's flexibility allows for both planned and event-driven sampling, recognizing that conditions can shift quickly.
- **Plain language matters.** Simple templates for planning, logging, and lab communication are more usable than jargon-heavy guides.

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[3] Community Health Councils, *Air Sampling Guidebook*, October 2019, https://www.chc4you.org/wp-content/uploads/2019/10/CHC_AirSampling_Guidebook_LowRes.pdf.

[4] Coming Clean, *When the Wind Blows*, accessed August 11, 2025, https://comingcleaninc.org/wind-blows.

[5] Environmental Law Alliance Worldwide (ELAW), *Guide to Collecting Environmental Samples: Module 3*, accessed August 11, 2025, https://elaw.org/wp-content/uploads/archive/attachments/publicresource/guide_to_collecting_environmental_samples_module3_english.pdf.

[6] Ecojustice, "Aamjiwnaang at Queen's Park to Chart New Path Forward to Tackle Toxic Pollution," March 27, 2024, https://ecojustice.ca/news/aamjiwnaang-at-queens-park-to-chart-new-path-forward-to-tackle-toxic-pollution/#:~:text=Surrounded%20by%20dozens%20of%20oil%20refineries%2C%20petrochemical,into%20one%20of%20Canada's%20most%20polluted%20areas.

[7] John Rieti, "Ontario First Nation Declares Emergency Due to Benzene Levels," *Environmental Health News*, April 26, 2024, https://www.ehn.org/ontario-first-nation-declares-emergency-due-to-benzene-levels.

[8] Emma McIntosh, "Aamjiwnaang Has Been Fighting Environmental Racism for Decades. Now, the First Nation Has an Agreement to Address It," The Narwhal, February 11, 2025, https://thenarwhal.ca/aamjiwnaang-sarnia-environmental-racism-pilot/.

- **Documentation supports credibility.** Contextual notes, chain-of-custody, and clear records help communities stand behind their findings.

Key Learnings

1. **Community-led research works differently and better for those it serves.** Starting with community priorities and adapting methods to their realities creates research that is relevant, respectful, and actionable.
2. **Simplicity is powerful.** A single, well-designed method explained in plain language can empower people to collect credible evidence without needing advanced technical backgrounds.
3. **Credibility comes from both data and process**. Careful documentation, trusted lab partnerships, and transparent decision-making are as important as the samples themselves for building evidence that can stand up in a variety of settings.

Overview of the Toolkit Structure

The final toolkit is a plain-language, community-facing document designed to be read sequentially or by section. Below is a high-level overview**:**

- **Introduction**
  - Purpose, intended audience, and scope of the toolkit. Emphasizes accessibility for Indigenous land defenders and grassroots organizers, and focus on VOC/BTEX monitoring.
- **Why Use Evacuated Canisters for Air Sampling?**
  - Explains the method, advantages, and why it is suited for VOC/BTEX investigations. Describes Summa vs. Silonite canisters, and case examples (e.g., Aamjiwnaang First Nation).
- **Equipment Overview: Canisters, Controllers, and More**
  - Lists core tools (canisters, flow controllers, gauges, caps, tags, COC forms, shipping). Includes 'Choosing the Right Canister: 1.4 L vs. 6 L' comparison table and recommended sampling strategy.
- **Planning Your Air Sampling**
  - Guidance on selecting sampling locations, timing, and duration. Includes community-driven examples and 'Choosing How Long to Sample' table.
- **Step-by-Step: How to Collect an Air Sample with a Canister**
  - Detailed instructions for 1.4 L and 6 L canisters, organized into preparation, during sampling, and after sampling steps, with weather and contamination precautions.

- **Working with a Commercial Lab: Renting Equipment, Sending Samples, and Getting Results**
  - Outlines lab services, rental process, analysis methods, accreditation importance, cost estimates, and public offerings from major Canadian labs.
  - Understanding BTEX Results Reported by the Lab
  - Guidance on reading lab reports, interpreting results, comparing to provincial/national standards, and estimating 24-hour averages**.**
- **From Data to Action – Using Results to Hold Polluters Accountable**
  - Best practices for ensuring credibility: lab accreditation, chain-of-custody, context documentation, and clear labeling.
- **Appendices**
  - Appendix A: Sample Field Log Template.
  - Appendix B: Chain-of-Custody Form link.
  - Appendix C: BTEX Ambient Air Detection Values Table (Ontario & Alberta).

Conclusion

This summer reinforced that community-supporting research depends on trust, clarity, and respect for local priorities. My work focused on turning a technical sampling method into a practical, plain language resource that communities can potentially adapt and use. In the process, I strengthened my ability to distill complex information, design steps for real world conditions, and anticipate the needs of air investigators.

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