

# AQRP Monthly Technical Report

<b>PROJECT TITLE</b>	<b>Hydrogen Cyanide for Improved Identification of Fire Plumes in the (BC)<sup>2</sup> Network</b>	<b>PROJECT #</b>	22-006
<b>PROJECT PARTICIPANTS</b>	<b>Dr. Tara I. Yacovitch, PI Dr. Rebecca Sheesley and Dr. Sascha Usenko, Co-PIs</b>	<b>DATE SUBMITTED</b>	7/10/2023
<b>REPORTING PERIOD</b>	<b>From: 6/1/2023 To: 6/30/2023</b>	<b>REPORT #</b>	11

A Financial Status Report (FSR) and Invoice will be submitted separately from each of the Project Participants reflecting charges for this Reporting Period. I understand that the FSR and Invoice are due to the AQRP by the 15<sup>th</sup> of the month following the reporting period shown above.

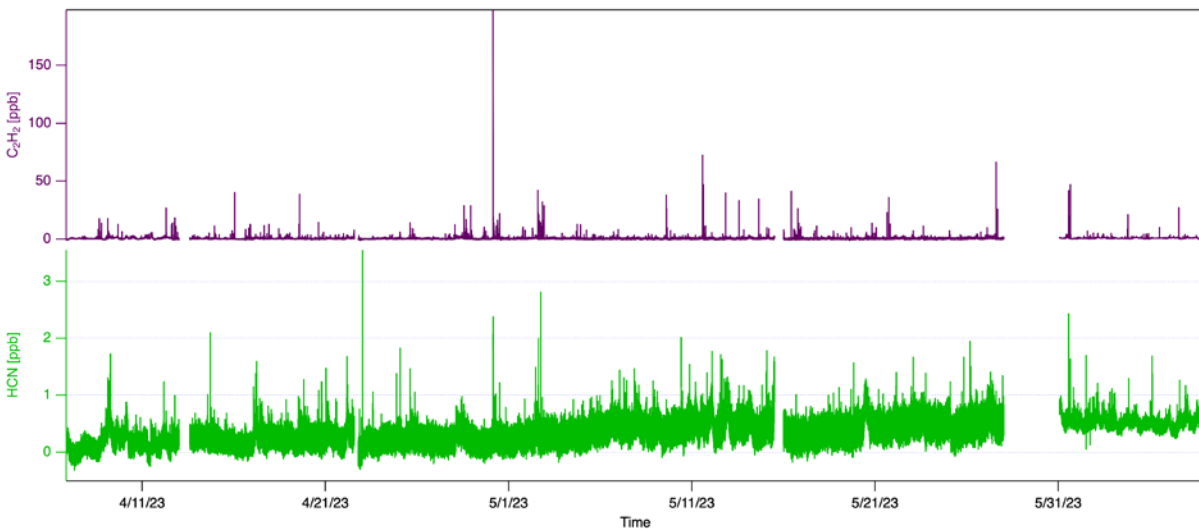
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## Detailed Accomplishments by Task for reporting period

The project team continues to hold regular meetings via telecon, and has scheduled several short weekly meetings as the project reaches its end.

The continued to run at Meacham International Airport in the month of June, collecting HCN data collocated with the BB2 trailer. A UZA tank was changed to allow for continued spectral zeroing. We have chosen a shut-down date July 6<sup>th</sup>, which satisfies (exceeds) the 66-day contracted measurement period, and aligns with everyone's schedules.

## Preliminary Analysis



HCN data has been baseline corrected when UZA zeroes were absent. In the graph below, baselines of no-UZA periods have been manually matched to the nearest available baseline with zeroes. An alternate but computationally expensive analysis strategy requiring spectral refitting

is possible after instrument shut-down and data transfer, and will help validate these baseline offsets.

As part of the BB2 project, preliminary biomass burning events have been identified at the Fort-Worth Northwest site, using only traditional BB network tracers. Preliminary HCN data for April and May has been shared and is in the process of being included in this analysis.

As part of the AQRP 22-010 project, Aerodyne mobile laboratory data, including data collocated at the Fort-Worth Northwest site has been analyzed. This data can provide secondary tracers to help identify plumes, particularly at night, when the mobile lab was not driving.

## **Data Collected**

Ambient data is currently being collected at Meacham International Airport from the sample inlet at the (BC)<sup>2</sup> network trailer. Auxiliary data collected by the AML in this area as part of a separate project (AQRP 22-010) could aid in interpretation of this dataset.

## **Identify Any Problems or Issues Encountered and Proposed Solutions or Adjustments**

The absence of UZA zeroes for portions of the campaign presents a challenge for data QA and analysis. We have applied a preliminary offset to this data, but have planned for a more rigorous but computationally expensive check of these offsets. This will require refitting of the archival spectral data collected by the instrument during the affected data portions, and for some time before and after. Dr. Herndon and Dr. Yacovitch will contribute to this effort.

Baylor has identified a problem with past project spending not getting properly charged to this grant, and as a result, has excess funds. We would like to seek approval to use this excess in the following way: Baylor will pay for return shipping of the instrument to Aerodyne, along with some remaining materials. Aerodyne will shift personnel to additional needed data analysis tasks in the final crunch of this project (Dr. Herndon) to make up for remaining funds. This request does depend both on AQRP and TCEQ approval, and will require contract amendments for both Baylor and Aerodyne. See final section of this report for additional financial details.

## **Goals and Anticipated Issues for the Succeeding Reporting Period**

In the next reporting period, the Aerodyne and Baylor groups will work closely together to safely shut down the HCN TILDAS instrument, transfer required data digitally, and prepare a return shipment.

We will work with AQRP, TCEQ, and our institutional contracting offices to work on the requested project re-budgeting.

Aerodyne will focus on data QA of the HCN data stream. Baylor will focus on incorporation of HCN data in BB event detection algorithms.

## **Detailed Analysis of the Progress of the Task Order to Date**

Campaign data collection is nearly complete, and we are moving onto an intensive analysis phase of the project. Analysis will need to happen concurrently with report outlining/writing as we work to meet the August 31<sup>st</sup> project deadline.

**Do you have any publications related to this project currently under development? If so, please provide a working title, and the journals you plan to submit to.**

Yes       No

**Do you have any publications related to this project currently under review by a journal? If so, what is the working title and the journal name? Have you sent a copy of the article to your AQRP Project Manager and your TCEQ Liaison?**

Yes       No

**Do you have any bibliographic publications (i.e.: publications that cite the project) related to this project that have been published? If so, please list the reference information. List all items for the lifetime of the project.**

Yes       No

**Do you have any presentations related to this project currently under development? If so, please provide working title, and the conference you plan to present it (this does not include presentations for the AQRP Workshop).**

Yes       No

**Do you have any presentations related to this project that have been published? If so, please list reference information. List all items for the lifetime of the project.**

Yes       No

**Have any personnel changes occurred that were not listed in the original proposal? If so, please include a detailed description of the personnel change(s) below.**

Yes       No

Dr. Yacovitch returned from family leave. She has resumed project management and reporting duties.

Dr. Herndon will be taking on additional project hours during the spend-out portion of this project, focused on spectral analysis/refitting and on report writing. This is an unanticipated analysis need stemming from the failure of UZA zeroes for portions of the campaign, as described in technical sections above. This is not a personnel change.

**Are any delays expected in the progress of the research? If so, please include a detailed description of the potential delay below.**

Yes       No

Given the previous delays with the electrical work at the sampling sites in the DFW, measurement days were added to the spring campaign from the fall campaign. We now have a campaign end date of July 6<sup>th</sup>, 2023. We have adjusted the dates for project data deliverables, as follows:

Table 1. Remaining project-specific deliverables

Task	Deliverable	Due Date	Responsible Party
Task 3. Data Analysis	Finalized dataset including QA'ed and calibrated HCN and expanded list of tracers (acetaldehyde, water vapor).	<del>1 month after completion of field campaigns (Dec 2022 &amp; Spring/Summer 2023)</del> <b>2 weeks after completion: July 20<sup>th</sup>, 2023</b>	Yacovitch and Daube
Task 4. Data Analysis	Enhanced fire plume characterization to be shared in technical and final reports.	<del>2 months after receipt of QA'ed dataset (Jan/Feb 2023; Summer 2023 and beyond)</del> <b>In draft Final Report, August 1<sup>st</sup>, 2023</b>	Sheesley and Usenko

**Describe any possible concerns/issues (technical or non-technical) that AQRP should be made aware of.**

See above sections describing the ongoing issues and project changes.

**Are you anticipating using all the available funds allocated to this project by the end date? If not, why and approximately what is the amount to be returned?**

Yes       No      (see below)

Baylor has identified a problem with past project spending not getting properly charged to this grant, and as a result, has excess funds of about 8K. We would like to seek approval to use this excess in the following way: Baylor will pay for return shipping of the instrument to Aerodyne, along with some remaining materials. Aerodyne will shift personnel to additional needed data analysis tasks in the final crunch of this project (Dr. Herndon) to make up for remaining funds. This request does depend both on AQRP and TCEQ approval and will require contract amendments for both Baylor and Aerodyne. We have begun this process.

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Submitted to AQRP by,

Dr. Tara Yacovitch