AQRP Monthly Technical Report

PROJECT TITLE	**Hydrogen Cyanide for Improved Identification of Fire Plumes in the $(BC)^2$ Network**	**PROJECT #**	22-006
PROJECT PARTICIPANTS	**Dr. Tara I. Yacovitch, PI** **Dr. Rebecca Sheesley and Dr. Sascha Usenko, Co-PIs**	**DATE SUBMITTED**	2/10/2023
REPORTING PERIOD	**From:** 1/1/2023 **To:** 1/31/2023	**REPORT #**	6

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 15th of the month following the reporting period shown above.

Detailed Accomplishments by Task for reporting period

The project team continues to hold project meetings on a weekly basis via telecon.

In mid-January, Dr. Usenko coordinated a tentative schedule (pending approval by TCEQ at the time) with electrical contractors (Prism Electric), utility representatives (Oncor), and on-site management at Mecham Airport in Fort Worth (Mr. Dakota Shaw, Airport Operations Manager). Efforts to install service at this site included digging a trench, cable and panel installation, and service switchover. During this process, inspection performed by city officials dictated the need for further work prior to service connection. Inclement weather and scheduling issues have pushed the final service hookup date to mid-February when all necessary parties can be present. If successful, the $(BC)^2$ equipment can be promptly deployed.

Aerodyne engineers have replicated and documented the faulty valve behavior experienced at Baylor University. Relevant components are being incrementally tested to identify the source issue. Replacement parts will be installed after the issue is well-enough understood to conclusively determine that the change will bring back expected behavior and performance. Understanding this in great detail will hopefully lead to insights into the decreased detector performance as well since the issues appeared to occur concurrently and may be related.

Preliminary Analysis

No preliminary analysis has been done in this reporting period.

Data Collected

Ambient data at Baylor University was collected. This data is not part of the project deliverables but was used to identify an instrument issue.

Identify Any Problems or Issues Encountered and Proposed Solutions or Adjustments

Previous delays with site electrical upgrades, combined with the instrument issues identified in November have caused the measurement days from the anticipated fall campaign to be moved to the spring campaign.

The original project design included a 45-day deployment in the fall, (Sept – Oct); and a 21 day deployment in the spring (to coincide with Aerodyne mobile lab project AQRP 22-010, which is tentatively being scheduled for April). The full 66 HCN measurement days will now be allocated to this spring measurement period. We expect redeployment to occur in March when $(BC)^2$ network sites first get turned on, in advance of the April 1st $(BC)^2$ network start.

Accomplishing the science goals of this project depends on measuring biomass burning emissions in the DFW area. We still believe an extended spring campaign gives us the greatest likelihood of capturing such emissions from a variety of sources.

Goals and Anticipated Issues for the Succeeding Reporting Period

Dr. Usenko and others previously mentioned have nearly completed setting up electrical service at the Mecham Airport site. We anticipate that one of the $(BC)^2$ trailers will be deployed as soon as possible to this site. At that point, we hope to review the logistics of reintegrating the HCN instrument when ready.

We continue to evaluate and repair the HCN instrument at Aerodyne. Assessment of the instrument has taken longer than expected due to the staffing availability (illness, personal matters). Efforts have increased in the last couple weeks and should result in forward progress soon. Once the instrument has been repaired and operates to our satisfaction (with the same precision as initially achieved prior to the original shipment), it will be monitored and operated for a short period of time (1-2 weeks) before being shipped back to collaborators at Baylor University. We expect Aerodyne engineers will diagnose and repair the HCN instrument in a timely manner, but new issues could be found upon close inspection.

Detailed Analysis of the Progress of the Task Order to Date

Measurement days originally assigned to the fall campaign have been added to the spring campaign.

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 (ie: 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**

As described in the Workplan documents, and discussed directly with AQRP project management, Dr. Yacovitch will be on family leave beginning mid-December for approximately 4 months, with Conner Daube handling project management and reporting during her absence.

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 ongoing delays with the electrical work at the sampling sites in the DFW, measurement days have been added to the spring campaign from the fall campaign.

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**

Submitted to AQRP by,

Conner Daube