

AQRP Monthly Technical Report

PROJECT TITLE	Quantifying the Emissions and Spatial/Temporal Distributions of Consumer Volatile Chemical Products (VCPs) in the Greater Houston Area	PROJECT #	22-020
PROJECT PARTICIPANTS	Dr. Yue Zhang, Alana Dederro, Yeaseul Kim, Zhenli Lai, Dr. Ying Qi, Hee Won Yim	DATE SUBMITTED	02/10/2023
REPORTING PERIOD	From: 1/1/2023 To: 1/31/2024	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

1. Designed four different routes around Houston to sample the volatile consumer products (VCP) and other species in the Greater Houston area
2. Launching a second deployment for the mobile lab with all instruments (Vocus, aerosol mass spectrometer, CO monitor, NO₂ monitor, soot monitor, scanning electric mobility sizer, ozone monitor, and other supporting devices) in Houston

Data Collected

1. We have collected full suite of data of the trace gases (Vocus), particle phase chemical composition (AMS), CO, NO₂, O₃, aerosol size distribution, GPS location through our deployment around Houston, Rockport, Corpus Christi, San Antonio, and Austin.
2. We have collected the above gas and particle information both during the day and at night, during weekends and weekdays, and on sunny, cloudy, and rainy days.
3. We also have collected Vocus data both in ammonia (NH₄⁺) mode and water cluster (H₃O⁺) mode.

Identify Any Problems or Issues Encountered and Proposed Solutions or Adjustments

N/A

Goals and Anticipated Issues for the Succeeding Reporting Period

1. Dr. Zhang's lab expects to complete at least 10 deployments for the AQRP project during our second deployment period.
2. Dr. Qi Ying's lab continues to work on the CAMQ model simulation to prepare to analyze the VCP data collected from this deployment.

Based on the current progress, both goals are on track. We will analyze the data after the field deployment to achieve the second goal.

Detailed Analysis of the Progress of the Task Order to Date

On January 4th, PI Zhang's lab started loading the instruments to the mobile lab and prepared for the second deployment in winter. The reason for the second deployment is to understand the seasonal difference of VCP emissions and also to remove any interference from the vegetation.

We are currently conducting field measurement and performed initial data analysis. Below are the route maps we have conducted during this field study. We plan to analyze the full suite of data after the deployment finishes.

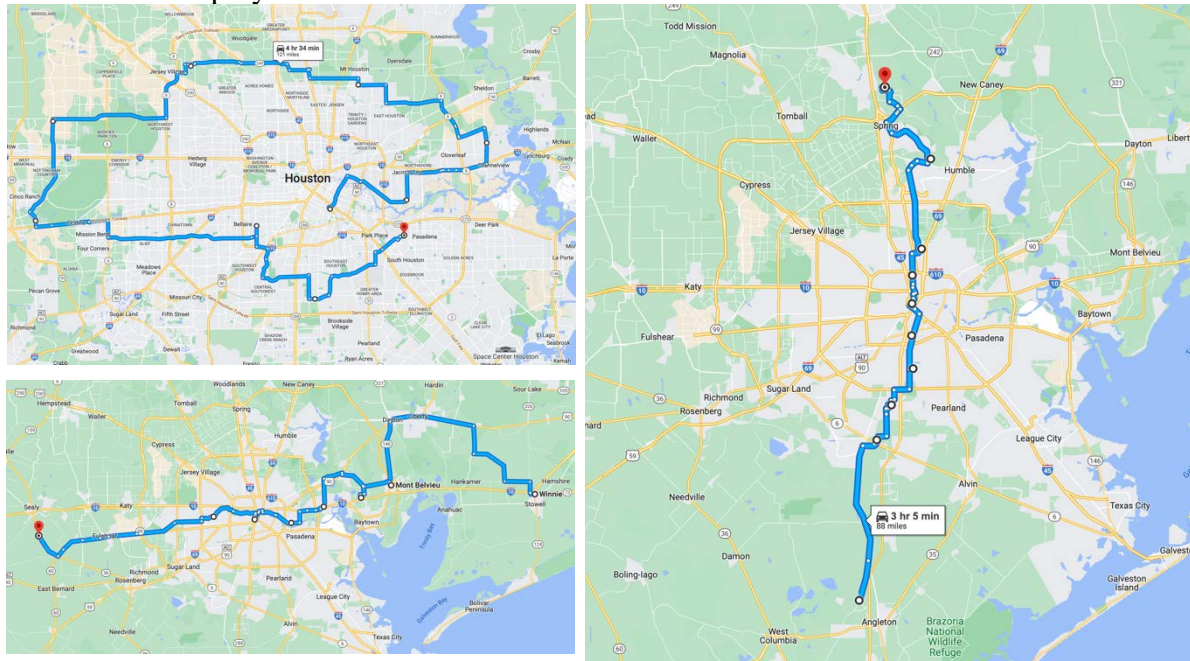


Figure 1. Deployment map during the field project in January 2023

In addition, below are the exterior and the interior images of the mobile lab. We have a wireless 5G service that can connect all instruments and project the screen to the front passenger seat.



Figure 2. Exterior and roof top (with three air sensors) view of the mobile laboratory

By the end of January we have already completed 12 deployments, fulfilling our initial goal of the second deployment.

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

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

Yes No

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

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

The whole funding is expected to be used by the end of the project date.

Submitted to AQRP by Dr. Yue Zhang