

AIR QUALITY RESEARCH PROGRAM

**Texas Commission on Environmental Quality
Contract Number 582-22-20017
Awarded to The University of Texas at Austin**

Quarterly Report
March 1, 2026 – May 31, 2026

Submitted to
Jocelyn Mellberg
Texas Commission on Environmental Quality
12100 Park 35 Circle
Austin, TX 78753

Prepared by
David T. Allen, Director
Center for Energy and Environmental Systems Analysis
The University of Texas at Austin
3925 W. Braker Lane, WPR 3.340
Austin, TX 78759

August 14, 2026

The preparation of this report was financed through a grant from the Texas Commission on Environmental Quality (TCEQ), administered by The University of Texas at Austin (UT) through the Air Quality Research Program (AQRP). The contents, findings, opinions, and conclusions are the work of the author(s) and do not necessarily represent findings, opinions, or conclusions of the TCEQ.

TABLE OF CONTENTS

Table of Contents	3
Overview	4
Program Activities for the quarter	4
Background	6
Research Project Cycle	7
Research Projects	8
Project 26-001 (Baylor University)	8
Project 26-007 (George Mason University)	9
Project 26-015 (University of Houston)	11
Project 26-019 (Ramboll Americas Engineering Solutions, Inc.)	13
Project 26-029 (The University of Texas at Austin)	15
Project 26-030 (The University of Texas at Austin)	22
Independent Technical Advisory Committee	23
Table 1. Independent Technical Advisory Committee Members	24
TCEQ Relevancy Review	24
Advisory Council	24
Table 2. Advisory Council Members	25
Financial Status Report	26
Program Administration	26
Table 3: Administration Budget - May 2026 (2026-2027 Biennium)	26
ITAC	27
Table 4: ITAC Budget - May 2026 (2026-2027 Biennium)	27
Project Management	27
Table 5: Project Management Budget – May 2026 (2026-2027 Biennium)	27
Research Projects	28
Table 6: 2026-2027 Biennium Contractual/Research Project Budget – May 2026	28
Appendix A. Contractual Research Projects Approved For Funding (Biennium 2026-2027)	29

Texas Air Quality Research Program

Quarterly Report

March 1, 2026 – May 31, 2026

OVERVIEW

The goals of the State of Texas Air Quality Research Program (AQRP) are:

- (i) to support scientific research related to Texas air quality, in the areas of emissions inventory development, atmospheric chemistry, meteorology, and air quality modeling,
- (ii) to integrate AQRP research with the work of other organizations, and
- (iii) to communicate the results of AQRP research to air quality decision-makers and stakeholders.

PROGRAM ACTIVITIES FOR THE QUARTER

Between March 1 and May 31, 2026, AQRP program efforts focused primarily on completing the proposal review and selection process and initiating award administration for the 2026-2027 biennium. AQRP coordinated and hosted meetings and reviews of the Independent Technical Advisory Committee (ITAC) and Advisory Council. Principal Investigators (PIs) were notified of awarded and non-awarded project decisions on April 30, 2026. Awarded project details are listed in Appendix A.

During the proposal review and selection process, the ITAC met remotely on March 2, 2026, to discuss technical review comments for the proposals submitted in response to the 2026-2027 Request for Proposals (RFP). The ITAC met again on March 9, 2026, to finalize proposal rankings and funding recommendations for consideration by the Advisory Council.

The Advisory Council met remotely on March 23, 2026, to review the ITAC and TCEQ recommendations and to discuss available funding scenarios for the 2026-2027 biennium. The Advisory Council met a second time on April 29, 2026, to finalize budget discussions and funding recommendations for submission to the Texas Commission on Environmental Quality (TCEQ). Following review and discussion, the Advisory Council unanimously approved the projects listed in Appendix A for recommendation to TCEQ for funding.

During the April 29, 2026 meeting, the Advisory Council discussed a funding shortfall of \$12,534.73 within the Contractual/Research Projects budget. AQRP Director presented a proposal to reallocate available funds from the Administration budget based on program efficiencies achieved during the biennium, including conducting ITAC and Advisory Council meetings virtually, reducing travel and materials costs, and implementing electronic processes for report submission and program administration. Following discussion, the Advisory Council unanimously approved the reallocation of \$12,534.73 from the Administration budget to the Contractual/Research Projects budget to support the recommended research portfolio and enable funding of all recommended projects. Administration budget reallocation is listed in Table 6.

During its deliberations, the Advisory Council also voted to formally encourage TCEQ to secure additional funding, as available, to support future research focused on oil and gas emission sources

and their impacts on methane and criteria pollutant emissions. The Advisory Council recommended that these research needs be considered during future AQRP or TCEQ research planning activities.

On April 30, 2026, TCEQ acknowledged the Advisory Council's recommendations and confirmed that AQRP should proceed with project initiation and contracting activities for the recommended projects. Contracting, project assignments, and work plan development activities commenced following receipt of this authorization.

Following the award decisions, AQRP coordinated with the TCEQ to assign a UT AQRP Project Managers and TCEQ Project Liaisons and Backup Liaisons to each awarded project. AQRP also communicated with the PIs of non-awarded proposals who requested access to anonymized technical review comments and coordinated the appropriate response while maintaining reviewer confidentiality. Awarded projects, assigned AQRP Project Managers, and TCEQ Liaisons are listed in Appendix A.

AQRP Program Manager developed workflow planning for Work Plan documents and supporting materials for the awardees and coordinated reviews and comments from AQRP and TCEQ. Principal Investigators were asked to revise their work plans in response to the consolidated comments, and the work plan documents were finalized at various times throughout May 2026.

To support timely project initiation, Project 26-029 was executed in April 2026 due to schedule constraints and the need to meet program timelines. The UT PI budget was established in May 2026. The collaborator awards are currently under review. This allowed project activities at UT to begin promptly following award notification.

AQRP initiated contracting for all awarded projects using pre-approved subaward templates developed in coordination with the TCEQ AQRP Project Manager. The AQRP Program Manager served as the primary coordinator for subaward agreements with the subaward entities, including the collection and routing of required agreement materials, responding to contractual terms and conditions inquiries, and addressing any other contractual concerns from awardees.

AQRP Program Manager developed content and materials for the AQRP website updates to be implemented in the subsequent quarter. Due to a temporary AQRP staffing shortage, additional support staff may be utilized in the future to manage website publications. AQRP administrative staffing updates will be added to the Personnel Eligibility List form required by the TCEQ.

Throughout the reporting period, the AQRP Program Manager communicated regularly with TCEQ, AQRP leadership, project PIs, AQRP project managers, project liaisons, and subaward entities regarding program requirements, work plan development, and subaward contracting. During the next reporting period, AQRP expects to continue subaward negotiations with the subaward entities and UT Austin contracting offices.

BACKGROUND

Section 387.010 of House Bill (HB) 1796 (81st Legislative Session), directs the Texas Commission on Environmental Quality (TCEQ) to establish the Texas Air Quality Research Program (AQRP). The University of Texas at Austin (UT) was selected by TCEQ to administer the program. A contract for the administration of the AQRP was established between TCEQ and UT. Consistent with the provisions in HB 1796, up to 10% of the available funding is to be used for program administration; the remainder (90%) of the available funding is to be used for research projects, individual project management activities, and meeting expenses associated with an Independent Technical Advisory Committee (ITAC). The AQRP contract was extended for the 2026-2027 biennium with funding of \$750,000 per year.

In addition, approved carryforward funding from the prior biennium included \$15,584.65 allocated to Administration and \$60,678.27 allocated to the Contractual/Research Projects budget. During the April 29, 2026, Advisory Council meeting, the Council approved the reallocation of \$12,534.73 from the Administration budget to the Contractual/Research Projects budget based on administrative efficiencies achieved during the biennium. As a result, the total Contractual/Research Projects budget available for research awards increased to \$1,295,713.00, enabling funding of all projects recommended for award during the 2026-2027 grant period.

RESEARCH PROJECT CYCLE

The Research Program is implemented through a nine-step cycle each biennium. The steps in the cycle are described from project concept generation to final project evaluation for a single project cycle.

- 1) The project cycle is initiated by developing (in year 1) or updating (in subsequent years) the research priorities. The Air Quality Research Program (AQRP) Director, in consultation with the Independent Technical Advisory Committee (ITAC), the Advisory Council (the Council) and the Texas Commission on Environmental Quality (TCEQ), develop research priorities; the research priorities are released along with a Request for Proposals (RFP).
- 2) Project proposals relevant to the research priorities are solicited. The RFP will be found at <https://aqrp.ceesa.utexas.edu/research/request-for-proposals> once released.
- 3) The ITAC performs a scientific and technical evaluation of the proposals.
- 4) The project proposals and ITAC recommendations are forwarded to TCEQ. TCEQ evaluates the project recommendations from the ITAC and comments on the relevancy of the projects to the State of Texas's air quality research needs.
- 5) The recommendations from the ITAC and TCEQ are presented to the Council and the Council selects the proposals to be funded.
- 6) All Principal investigators are notified of the status of their proposals, either intent to fund, not funded, or contingent (not funded at this time but being held for possible reconsideration if funding becomes available).
- 7) Intent-to-fund projects are assigned an AQRP Project Manager at UT Austin and a Project Liaison at TCEQ. The AQRP Project Manager is responsible for ensuring that project objectives are achieved in a timely manner and that effective communication is maintained among investigators involved in multi-institution projects. The AQRP Project Manager has responsibility for documenting progress toward project measures of success for each project. The AQRP Project Manager works with the researchers, and the TCEQ, to create an approved work plan for the project.

The AQRP Project Manager also works with the researchers, TCEQ, and the Program's Quality Assurance officer to develop an approved Quality Assurance Project Plan (QAPP) and Work Plan for each project. Subaward Agreements are issued. The AQRP Project Manager reviews monthly, annual, and final reports from the researchers and works with the researchers to address deficiencies.

- 8) The project findings are communicated through multiple mechanisms. Final reports are posted to the AQRP web site (<https://aqrp.ceesa.utexas.edu/>); and a biennial research conference/data workshop is held.

During this period, the AQRP performed steps 3, 4, 5, 6, and 7.

Research Projects

FY 2026-2027 Projects

Project 26-001 (Baylor University)

Title: Longterm trends in dust sources in West Texas

PI: Rebecca Sheesley, Baylor University

Status: AWARDED (contracts pending)

Co-PI: Elisabeth J. Andrew, University of Colorado, Boulder

Funded Amount: \$164,303.00

Co-PI: Gannet Hallar, University of Utah

AQRP Project Manager: David Sullivan

TCEQ Project Liaison: Laramie Mahan

Abstract: The focus of the project is identification of dust events in El Paso using three complementary methods for 2000-2020. This will enable a multi-faceted analysis of long-term trends and a comparison of the strengths and weaknesses across these methods, which address Texas AQRP Research Priority: long term trends in dust sources in West Texas. We will apply several different methods for identification and characterization of dust events: (1) remote sensing from satellite observations (Lambert, Hallar et al. 2020) and surface-based column measurements (Hallar, Petersen et al. 2015), (2) extraction of dust event descriptions from National Weather Service (NWS) reports (Kelley and Ardon-Dryer 2021), and (3) assessment of dust contributions to particulate matter (PM) from in-situ aerosol observations (e.g. TCEQ PM10, PM2.5 and PM speciation data; (Sheesley and Usenko 2024, Rodriguez Ortiz, Mehra et al. 2025)). Each method utilizes a different dataset and, when combined, this project will offer a well-rounded characterization of dust events. We plan to compare results of dust event identification across these three methods for 2000-2020 in El Paso, TX to better understand how the input data informs dust event identification and characterization.

Project 26-007 (George Mason University)

Title: Characterization of international and domestic sources of windblown dust and contribution to fine and coarse particulate matter in Texas

PI: Daniel Tong, George Mason University

Status: AWARDED (contract pending)

Funded Amount: \$160,470.00

AQRP Project Manager: David Sullivan

TCEQ Project Liaison: Aristos Brandt

Abstract: Windblown dust poses increasing challenges to air quality, public health, and transportation safety. In 2025, for instance, Texas experienced the dustiest spring since the Dust Bowl era, with 42 vehicle crashes and four fatalities caused by a single dust storm on March 14, 2025. Another critical issue in Texas is that crustal materials originating from Mexico and overseas sources such as the Saharan Desert can be transported by winds into Texas. The Clean Air Act section 179B states that pollution that originates outside of US borders is not to affect National Ambient Air Quality Standards (NAAQS) compliance. Given the high stakes associated with dust risks and complexity of dust source attribution, it is important to investigate the trends of dust storms and understand their sources and contributions to fine and coarse particulate matter (PM_{2.5} and PM₁₀) in this region.

The objective of this study is to understand the trends in windblown dust and its effects on PM_{2.5} and PM₁₀ in Texas. More specifically, we aim to 1) investigate the long-term trends in windblown dust activity in Texas and three “upwind” states (New Mexico, Oklahoma and Colorado); 2) analyze the environmental drivers of the dust trends; 3) improve dust emission model by integrating satellite-detected dust sources and updating other model inputs, and 4) quantify contributions from in-state and out-of-state dust sources to PM_{2.5} and PM₁₀ in Texas.

The project consists of four major activities:

1. Reconstructing long-term dust trends from three ground networks. We will assemble windblown dust event records from three ground networks, including the Interagency Monitoring to PROtect Visual Environments (IMPROVE), the Texas Commission on Environmental Quality (TCEQ) air quality monitors, and National Oceanographic and Atmospheric Administration (NOAA) Integrated Surface Database (ISD). An intercomparison of these datasets will be performed to examine if there is a trend in the observed dust activity, and to identify high-dust and low-dust years for subsequent analyses and model simulations.
2. Analyzing and diagnosing environmental drivers of dust trends. Built on the lessons learned from prior studies, several environmental factors will be selected for this analysis, including both single variables such as wind speed, vegetation cover (Normalized Difference Vegetation Index (NDVI), precipitation, and soil moisture, and composite indices such as drought index and El-Nino Southern Oscillation (ENSO). Identified key factors will be used to guide model optimization.
3. Improving windblown dust emission modeling. To address the large uncertainties existing in windblown dust modeling, this task will: i) update soil texture in Mexico and the US based on a hybrid State Soil Geographic database Version 2 (STATSGO2)/Food and Agriculture Organization (FAO) derived map; ii) improve Mexico dust sources using a newly available Geostationary Operational Environmental Satellites (GOES) dust initiation map; iii) improve

domestic cropland dust sources with George Mason University (GMU)/U.S. Department of Agriculture (USDA) CropScape data; and iv) conduct sensitivity tests with other key inputs, including winds, vegetation cover, surface roughness, and soil moisture.

4. Quantifying windblown dust effects on $PM_{2.5}$ and PM_{10} . We will use the optimized modeling system to quantify the effect of windblown dust emissions on $PM_{2.5}$ and PM_{10} in Texas. We choose a high-dust period and a low-dust one and use the updated model to reproduce the “relative trend”, and to assess windblown dust contributions in both periods. For each selected period, we will conduct two simulations: without and with windblown dust emissions. The dust contribution is calculated from the difference between the two simulations.

This work directly addresses the Research Priority area “Trends in wind-blown dust ($PM_{2.5}$ and PM_{10}) in Texas”. Leveraging prior work, this project will reconstruct long-term dust trends from ground stations and design a suite of dust emission improvements to reduce dust modeling uncertainties. This project also directly aims at “better characterization of the multiple sources of windblown dust and their contribution to PM_{10} and $PM_{2.5}$ ”. Although the windblown dust model FENGSHA is currently implemented as a module in Community Multiscale Air Quality (CMAQ), a standalone version will be made available to the community so that it can be easily incorporated in other models such as Comprehensive Air Quality Model with Extensions (CAMx).

Project 26-015 (University of Houston)

Title: Improving Urban Representation in High-Resolution WRF-CAMx Model and Evaluating the Effects on PBL and Ozone Prediction

PI: Yuxuan Wang, University of Houston
Co-PI: James Flynn, University of Houston

Status: AWARDED (contract pending)
Funded Amount: \$192,960.00
AQRP Project Manager: Elena McDonald-Buller
TCEQ Project Liaison: Gabriel Lee

Abstract: The Weather Research and Forecasting (WRF) model and the Comprehensive Air Quality Model with Extensions (CAMx), as used in Texas State Implementation Plan (SIP) configuration, represent the entire urban landscape of the Houston-Galveston-Brazoria (HGB) area with a single “Urban and Built-Up” category with uniform building height, surface roughness, and thermal storage across all urban grid cells within the HGB domain. As photochemical air quality models continue to increase their resolutions to kilometer and sub-kilometer scales, such a simple treatment of urban heterogeneity imposes a fundamental limit on our ability to capture the complexity of urban boundary-layer processes that directly influence and escalate the development of ozone. To address these limitations, this AQRP project aims at improving urban representations in the km-scale WRF-CAMx model through the integration of urban classification, urban morphology, and urban vegetation, which will lead to improvements in the urban planetary boundary layer (PBL) and ozone for the HGB region. In addition, Galveston Bay will be distinguished from the Gulf of America as a separate surface category to enable physically realistic representations of thermal structure and turbulence over coastal waters. Using observations from recent (2021-2023) field campaigns, which sampled the diversified landscapes of the HGB via mobile laboratories, the project will evaluate how combined refinements to urban morphological heterogeneity, urban vegetation, and different water surfaces reduce systematic biases in the PBL and ozone across the HGB region.

Specifically, the project’s objectives are to answer the following scientific questions:

1. Urban classification: How does replacing the default single urban land-use category with 10 diversified Local Climate Zones (LCZs) improve the simulation of meteorological variables, PBL, ozone, and its precursors across the HGB region?
2. Urban morphology and vegetation: To what extent does integrating spatially continuous urban morphology (e.g., building heights) and LCZ-specific, high-resolution urban vegetation parameters (e.g., LAI) enhance the simulation of mechanical drag, vertical mixing, dry deposition, and emissions of biogenic volatile organic compounds (BVOCs), and thereby improve the prediction of meteorological variables, PBL, ozone, and its precursors across the HGB region?
3. Water body characterization: How do distinct thermal and physical representations of Galveston Bay and the Gulf of America influence the prediction of sea/bay-breeze evolution, marine PBL, and land-water pollutant transport across the HGB region?

4. Integrated impacts: Does the combined refinement of urban surface characteristics (morphology and vegetation) and marine/coastal surface boundaries reduce the systematic ozone predictability gap more effectively than isolated adjustments to individual model components?

The project specifically targets the AQRP Research Priorities 2026-2027: Photochemical air quality models with the goal of improving model performance in urban planetary boundary layer height and ozone at the km scale. The urban focus of the project will lead to improvements in the SIP modeling of the HGB. The delivery of new modeling approaches and input data to improve urban classification, urban morphology, and urban vegetation representations in WRF-CAMX will be transferable to air quality modeling of other urban areas in Texas.

Project 26-019 (Ramboll Americas Engineering Solutions, Inc.)

Title: Advancing Assessment of NO_x Emissions and Temporal Variability using TEMPO NO₂ and CAMx

PI: Tejas Shah, Ramboll Americas	Status: AWARDED (contract pending)
Co-PI: Daniel Goldberg, George Washington University	Funded Amount: \$230,849.00
Co-PI: Jeremiah Johnson, Ramboll Americas	AQRP Project Manager: Elena McDonald-Buller
	TCEQ Project Liaison: Benjamin Yusuf

Abstract: Nitrogen oxide (NO_x) emissions are key precursors to ozone formation. Accurate characterization of these emissions is critical for understanding ozone formation in both urban and regional environments, and for supporting attainment and maintenance of the ozone (O₃) National Ambient Air Quality Standards (NAAQS). Our previous work using Tropospheric Emissions: Monitoring of Pollution (TEMPO) satellite NO₂ observations demonstrated the potential to constrain NO_x emissions by source sector across Texas, including Houston, Dallas-Fort Worth, and rural areas. That effort developed methods to integrate TEMPO observations with Comprehensive Air quality Model with extensions (CAMx) chemical transport model results, including flux divergence and multiple linear regression approaches, and revealed persistent discrepancies between modeled and observed NO₂ columns during September 2023. Those results indicated that on-road and off-road vehicle emissions are often underestimated especially in the morning; soil and lightning NO_x contributions carry substantial uncertainties; and current inventories need better spatiotemporal allocation of emissions. Building on these findings, this project will further quantify and assess uncertainties in NO_x emission inventories, including in the temporalization of emissions, using refined emission inputs for selected source sectors.

To address observed model biases, this project will examine key sources of uncertainty in the regional NO_x emission inventory. Specifically, the analysis will evaluate whether medium- and heavy-duty diesel vehicle tampering and mal-maintenance (T&M) prevalence is higher than currently represented in MOVES5 and update natural soil and lightning NO_x emissions using state of the science approaches. EPA's technical documentation for MOVES5 recommends that T&M rates be re-evaluated and updated, suggesting that current rates may underestimate real world T&M prevalence and on-road NO_x emissions in urban corridors such as Houston and Dallas-Fort Worth. Separately, outdated soil NO_x and lightning NO_x parameterizations may contribute to discrepancies in background NO_x across agricultural regions and transitional rural-urban zones. The original and updated inventories will be evaluated using tropospheric NO₂ column retrievals from the TEMPO satellite instrument in conjunction with CAMx simulations.

This work aligns with multiple Texas Air Quality Research Program (AQRP) Research Priority Areas, as summarized in Table 26-019-1.

Table 26-019-1. How this project will respond to the AQRP Research Priority Areas.

Research Priority Area	How this project addresses the Research Priority
Improve emissions inventories	This project will improve NO _x emission inventories by updating soil, on-road, and lightning sources. It will apply the updated MEGAN soil NO _x module, which incorporates revised temperature and soil moisture responses, updated nitrogen inputs, and soil HONO emissions. On-road emissions will be adjusted to account for diesel vehicle T&M and lightning NO _x will be updated based on recent literature. The updated inventory will be evaluated using TEMPO NO ₂ measurements.
Use of satellite and other remote sensing data	TEMPO satellite measurements will be used to better understand diurnal patterns of NO ₂ and their relationship to NO _x emissions. TEMPO data will serve as the primary satellite dataset, and comparisons will also be made with TROPOMI data during periods of afternoon overlapping observations.

Project 26-029 (The University of Texas at Austin)

Title: Integrated Airborne-Mobile Ground Observations and Inventory for Enhanced VOC Source Attribution and Ozone Precursor Mapping in Texas

PI: Pawel K. Misztal, UT Austin	Status: AWARDED (contracts pending)
Co-PI: Lea Hildebrandt Ruiz, UT Austin	Funded Amount: \$299,999.00
Co-PI: Yue Zhang, Texas A&M University	AQRP Project Manager: David Sullivan
Co-PI: Nathan Malarich, University of Colorado Boulder / CIRES	TCEQ Project Liaison: Morshad Ahmed
Co-PI: Munkhbayar Baasandorj, UT Austin	

Abstract: The Houston-Galveston-Brazoria, and Dallas-Fort Worth nonattainment areas face a July 2027 attainment deadline under the 2008 ozone National Ambient Air Quality Standards (NAAQS), with the recently adopted Section 185 penalty fee program contingent on that outcome. San Antonio is in serious nonattainment for the 2015 ozone NAAQS, with an attainment date of September 24, 2027. Accurate volatile organic compound (VOC) emission inventories are essential for the photochemical modeling that underpins the Texas Commission on Environmental Quality (TCEQ) State Implementation Plan (SIP) development. However, everyday consumer and commercial products such as paints, cleaning supplies, personal care products, and adhesives, collectively known as volatile chemical products (VCPs), now constitute approximately half of VOC emissions in cities, yet remain underrepresented in current emission inventories.

Project 26-029 will deploy two all-electric mobile laboratories from the University of Texas at Austin and Texas A&M University to measure a broad range of VOCs and VCP tracers across three Texas regions: Houston-Beaumont-Port Arthur, Dallas-Fort Worth, and Austin-San Antonio. Ground-based measurements will be coordinated with the National Oceanic and Atmospheric Administration (NOAA) Texas Air Quality Study 2026 (TexAQS 2026) airborne campaign. The combined ground and airborne data will be used to compare field-measured emissions against existing inventories through mass-balance approaches. Source apportionment analysis will quantify VCP contributions to total VOC emissions and ozone formation potential across the three regions.

The proposed work directly addresses TCEQ priorities for improved emission inventories in nonattainment areas and will deliver Texas-specific VCP source profiles, inventory comparison reports with improvement recommendations, and ozone formation potential assessments to support air quality management strategies.

Project Updates:

Detailed Accomplishments by Task for reporting period

Task 1: Preparatory activities so far included regular participation of project PIs in coordination meetings for TexAQS 2026 (Wednesdays at 1 pm CDT) followed by flight planning coordination meetings with minutes recorded. TCEQ representatives were also present, and focal areas and target sources were discussed.

On April 1, PIs met with TCEQ to discuss questions and TCEQ recommendation for areas of interest which were taken into account for the work plan and in planning mobile routes. In the May 6th coordination meeting, stationary site coordination and preliminary mobile tracks were discussed. Data centers were identified as a non-traditional source whose impact on O₃ and PM_{2.5} attainment is currently unquantified.

Figure 26-029-1 shows preliminary aircraft flight tracks (shown as pink lines) and mobile routes (shown as dark blue lines) in the three focal areas whereas Figures 26-029-2, 26-029-3, and 26-029-4 zoom in on each of the areas, Dallas, Houston, and San Antonio, respectively. Doug Boyer (TCEQ) provided CSV with TCEQ stations in Texas. In designing the routes, locations of the auto-GC and VOC canister CAMS stations were taken into account for collocation opportunities. Industrial, waste management sources, and data centers have also been considered. The plan is to perform at least 20 repeats of the tracks in each metropolitan region, with each lab contributing 10 drives. The length of each track is about 3-4 hours so the team will aim to perform at least two of those per day. Additional drives will occur in Austin in the last two days of the campaign. Austin track will be shorter to allow more repetitions and will run near data centers, EV and semiconductor manufacturing, wastewater, and other sources in SE Austin.

The campaign's preliminary schedule is available in the campaign schedule document [1]. The first drive is planned to coincide with the first research flight in Dallas on May 30th. The second week of the campaign will happen in Houston, while the last week in San Antonio and Austin. This order has been recently revised to avoid overlapping the Houston mobile measurements with the FIFA World Cup 2026 in Houston. Stationary measurements will continue in Houston throughout the campaign led by Yue Zhang, James Flynn, and NOAA through a ground supersite with 20+ instruments, including 4 mass spectrometers to provide comprehensive quantification of both gas and particle phase species. Ground supersite will be operated throughout the TexAQS 2026 campaign, and data will be complementary to the mobile data. The UT HR-ToF-AMS and UT Picarro HCHO/CH₄ instruments will be deployed at those ground sites as part of this project. Other ground data are available to be shared with TCEQ and the mobile measurement team upon request with the supersite PI.

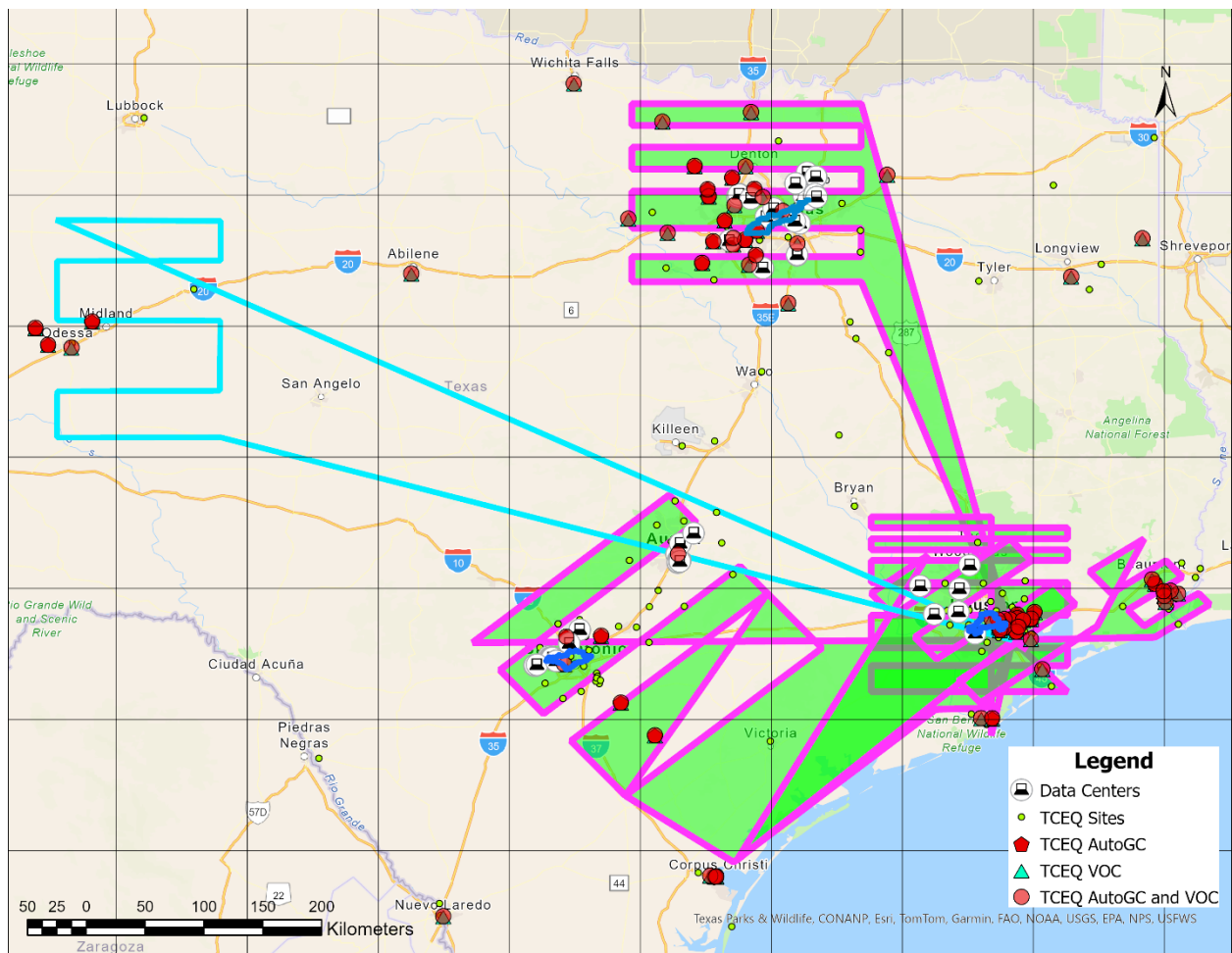


Figure 26-029-1. Overall map showing preliminary flight tracks (pink for DFW, Houston, and San Antonio, and light blue for the Permian Basin) and ground mobile deployments (dark blue).

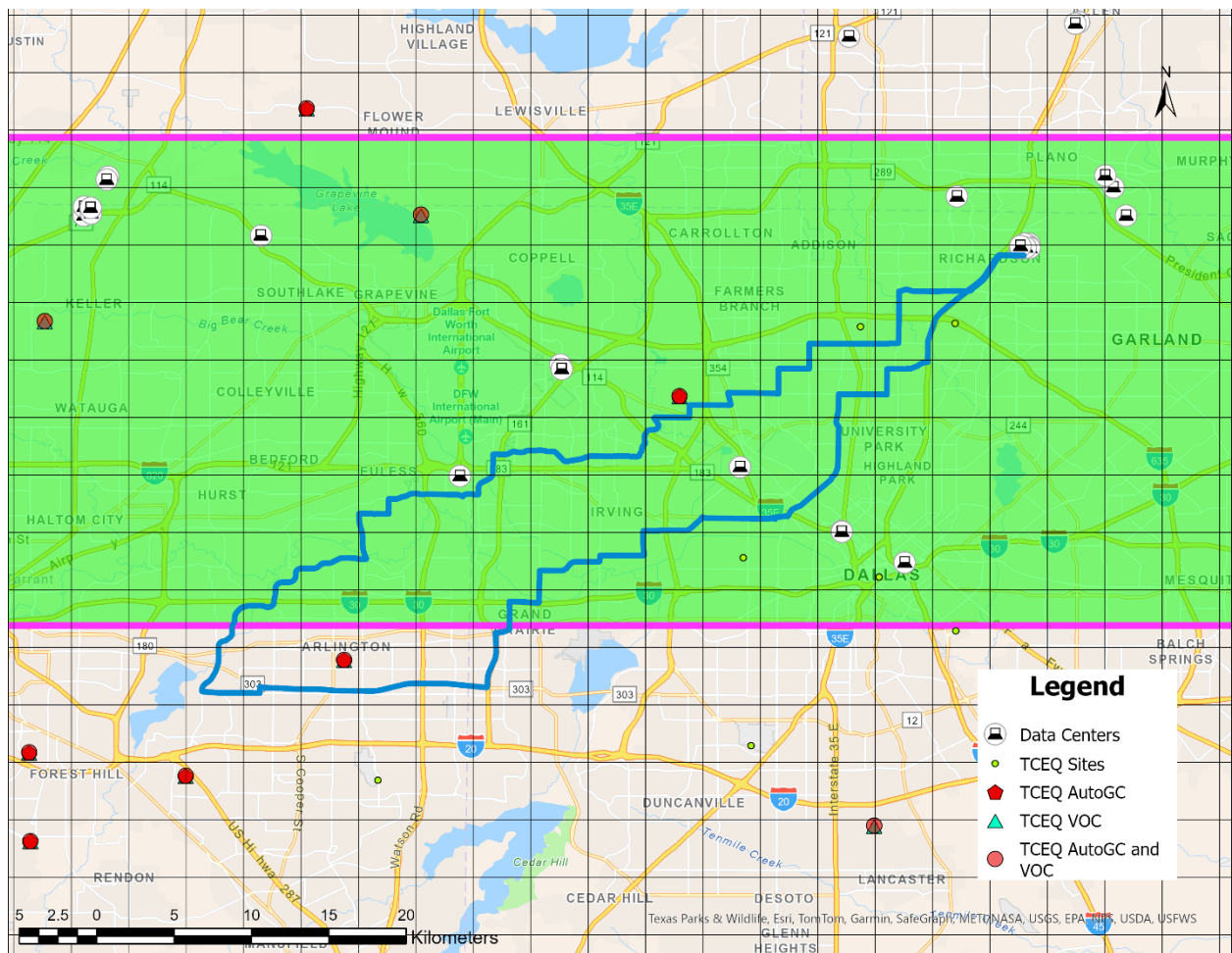


Figure 26-029-2. Planned Dallas driving route.

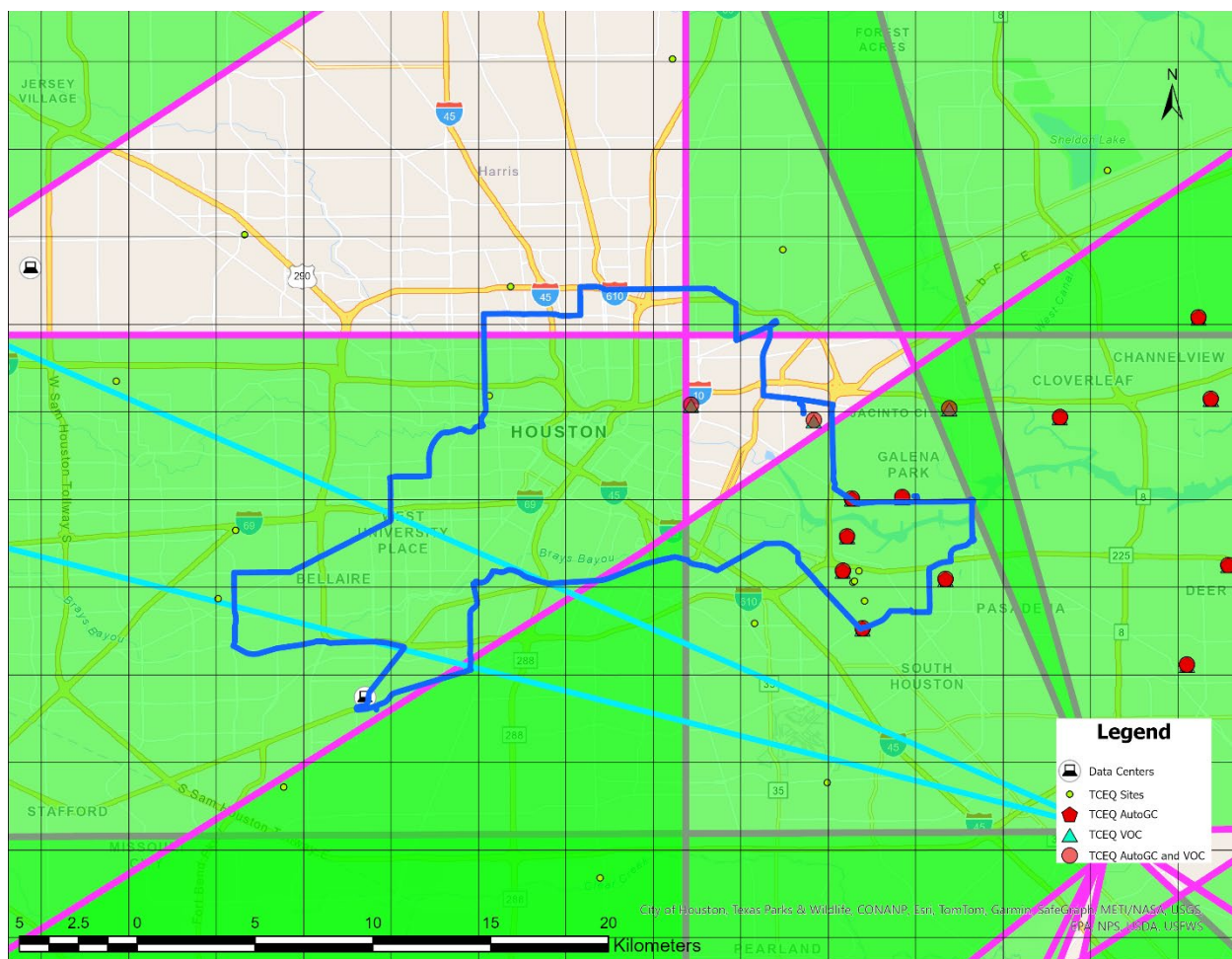


Figure 26-029-3. *Planned driving route for Houston.*

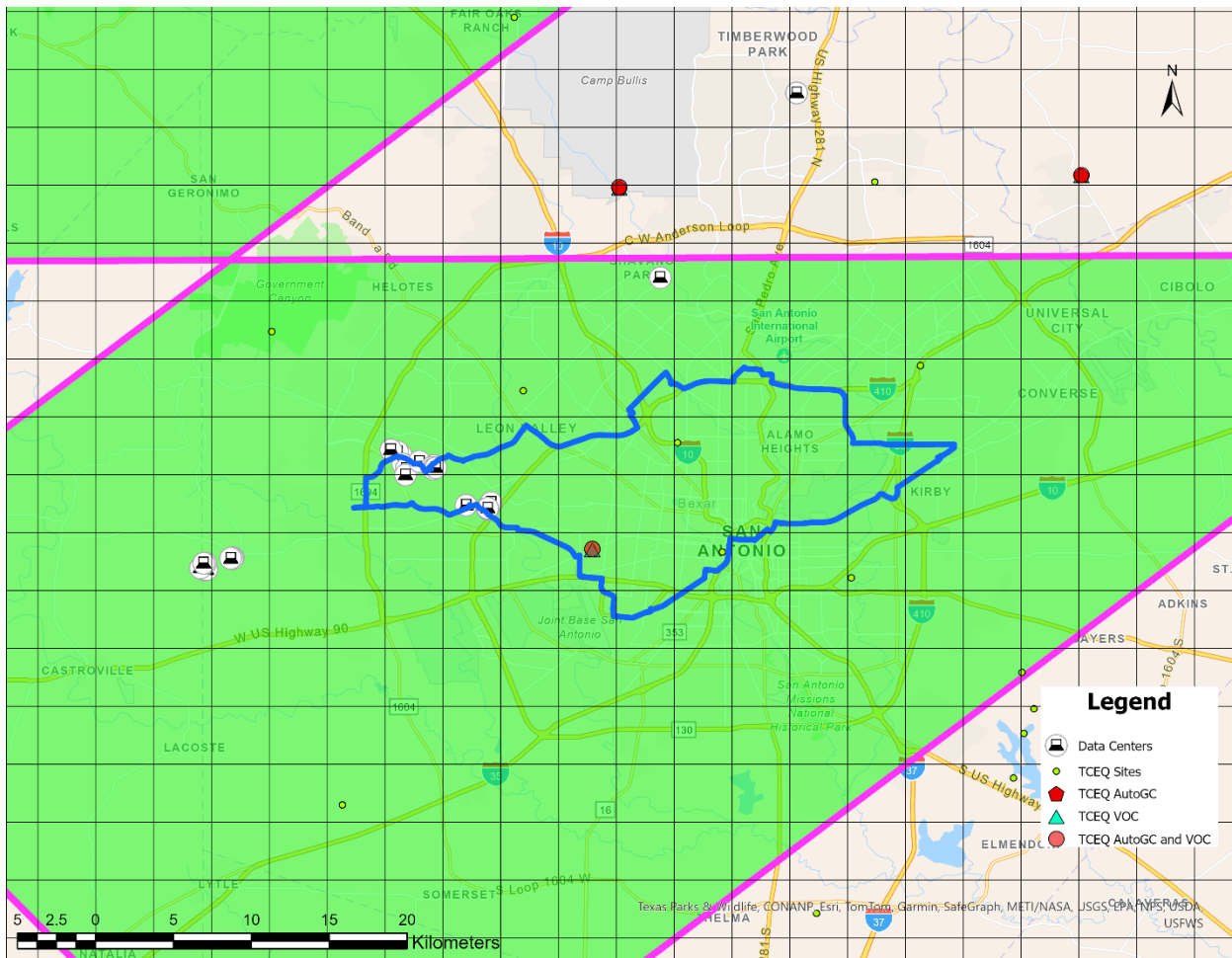


Figure 26-029-4. *Planned driving route for San Antonio.*

The main focus of the mobile campaign is on Dallas, Houston and San Antonio areas receiving 20 repeats of the optimized tracks. Complementary mobile measurements for San Antonio – Austin area will be conducted in Austin to overlap with the last aircraft passes on June 13 and 14. Austin track will be shorter and the exact number of repetitions will be further discussed.

Preliminary Analysis

None

Data Collected

None

Identify Any Problems or Issues Encountered and Proposed Solutions or Adjustments

None

Goals and Anticipated Issues for the Succeeding Reporting Period

The observation team plans to execute stationary and mobile measurements consistent with the approved Work Plan, as outlined in the planning document [1] and the tracks presented in Figures

26-029-2 through 26-0294. The mobile campaign will proceed week by week across the three focal regions: Dallas in the first week (with the initial mobile drive coinciding with the first research flight on May 30), Houston in the second week, and San Antonio in the third week. Stationary measurements will continue in Houston throughout the campaign. Austin drives will be added at the end of the campaign to overlap with the final aircraft passes on June 13 and 14. Each metropolitan region is targeted for at least 20 track repetitions split between the two mobile labs (10 per lab), with two approximately 3-hour drives per day. Concentric driving patterns optimized for paired upwind/downwind sampling will be implemented.

Detailed Analysis of the Progress of the Task Order to Date

None

References:

[1] TexAQS 2026 Preliminary Campaign Schedule. University of Texas at Austin. Available internally at: <https://utexas.box.com/s/w7ywby2vc41b92hfd2x6o33hkslnqh> (accessed August 14, 2026).

Project 26-030 (The University of Texas at Austin)

Title: Advanced Analysis of Ozone Formation Potential, VOC Sensitivity, and Source Apportionment in the El Paso-Juárez Airshed

PI: Pawel K. Misztal, UT Austin	Status: AWARDED
Co-PI: Lea Hildebrandt Ruiz, UT Austin	Funded Amount: \$247,132.00
Co-PI: David Sullivan, UT Austin	AQRP Project Manager: Erin Tullos
Co-PI: Elena McDonald-Buller, UT Austin	TCEQ Project Liaison: Erik Gribbin

Abstract: El Paso County is designated as marginal nonattainment for the 2015 ozone National Ambient Air Quality Standards (NAAQS), and the 2024 tightening of the annual PM_{2.5} standard from 12 to 9 µg/m³ has placed the region closer to PM_{2.5} nonattainment. The El Paso-Juárez metropolitan area is one of the largest binational communities in North America, with air quality challenges arising from complex terrain, transboundary transport from Mexico, and diverse emission sources. AQRP Project 24-024, completed in August 2025, produced the most comprehensive air quality dataset collected in El Paso since the 1996 Paso del Norte Ozone Study, using an electric mobile laboratory equipped with a Vocus PTR-ToF-MS, an HR-TOF-AMS, and an aethalometer, complemented by a Comprehensive Air Quality Model with Extensions (CAMx) photochemical modeling platform for the 2022 base year. Initial extended analyses of these datasets, including ozone reactivity potential mapping and aerosol source apportionment, were presented to the Texas Commission on Environmental Quality (TCEQ) at the May 2026 State Implementation Plan Informational Meeting.

Project 26-030 will conduct advanced analyses of these existing datasets across five tasks. Ozone formation potential will be calculated under three independent frameworks (mass-based, molecular weight-based, and OH reactivity-weighted maximum incremental reactivity) using the El Paso-specific SAPRC-11 ELPTX scenario. Ozone sensitivity regimes will be mapped across the airshed using complementary indicator ratios and cross-validated against the existing CAMx simulations. Source apportionment will integrate Project 24-024 mobile Vocus and HR-TOF-AMS data with long-term TCEQ auto-GC records (2011 through 2025) and offline PM_{2.5} filter samples, applying combined Vocus-AMS Positive Matrix Factorization (PMF), reactivity-weighted PMF, and roadway-influence stratification. Existing CAMx Reactive Tracer outputs will be reanalyzed to characterize domestic and international emission source contributions to toluene at five El Paso monitoring sites.

The project will deliver spatially resolved priority VOC rankings for ozone reduction, ozone sensitivity regime classifications with TCEQ-validated indicator ratios, an integrated VOC and PM source apportionment that elucidates sources of ozone and aerosol precursors, and refined toluene source attribution to support binational air quality coordination. Although El Paso is not currently in serious ozone nonattainment, the methodological framework developed under this project is directly transferable to serious and severe nonattainment areas in Texas and will support Houston-Galveston-Brazoria, Dallas-Fort Worth, and Bexar County regulatory analyses.

Independent Technical Advisory Committee

The Air Quality Research Program (AQRP) funding is to be used primarily for research projects, and one of three groups responsible for selecting the projects is the Independent Technical Advisory Committee (ITAC). The ITAC is composed of between 9 and 15 individuals with scientific expertise relevant to the AQRP. The ITAC is charged with recommending technical approaches, establishing research priorities, and reviewing, commenting, and advising on all projects to ensure that the projects facilitate air quality improvement in Texas. Members of the ITAC consist of the Texas Commission on Environmental Quality (TCEQ) Air Quality Deputy Director (or designee), and representatives with air quality expertise from research institutions with extensive expertise in air quality research in Texas. The members of the ITAC are listed in Table 1. The members of the ITAC are drawn from Texas universities active in air quality research, national laboratories that have participated in air quality studies in Texas, and institutions that have expertise not available in Texas and that have participated in air quality studies in Texas.

The ITAC membership is intentionally drawn from air quality researchers who have experience in Texas. These researchers and their colleagues will likely have interest in responding to the requests for research proposals issued by the AQRP. This raises potential confidentiality and conflict of interest issues, and the contract between TCEQ and the University of Texas at Austin requires that the AQRP maintain and implement an appropriate written policy on conflict of interest. Specifically, for the ITAC, all members are required to certify:

Confidentiality: As a member of Independent Technical Advisory Committee (ITAC), I understand that I will have access to proposals submitted to the Air Quality Research Program (AQRP). Subject to any legal requirements, I agree to keep the information in these proposals confidential until the selection process is completed and it is appropriate to release information to the public. I understand that there may be certain information that comes to me in my role as a member of ITAC that retains its confidential nature even after the process is concluded. I also understand that I will review said proposals and may have access to the reviews made by other ITAC members. I agree to keep these reviews and the identity of the reviewers confidential until such time as this information is released to the public. (NOTE: For the reviews and reviewers, this information may never be released.)

Conflict of Interest: As a member of ITAC, I agree that I will not evaluate, comment on, or vote on proposals in which I or my home institution is involved, including but not limited to, any financial interest, or in which I have another form of conflict of interest. I understand that ITAC members with conflicts of interest must leave the meeting room or the conference line when a proposal with which they have a conflict is discussed, voted on, or otherwise being considered. I understand that I must recuse myself from participating in or attempting to influence at any time the ITAC's or the AQRP Council's consideration or decision concerning such proposals. I agree to bring any issues concerning a possible conflict of interest to the attention of the Director of the AQRP or the TCEQ Air Quality Deputy Director. If there is a question of interpretation regarding whether a conflict of interest exists, I agree that the decision regarding whether a conflict of interest exists will be made by the Director of the Air Quality Research Program or the TCEQ Air Quality Deputy Director.

All members of the ITAC agree to abide by these conflicts of interest and confidentiality provisions prior to participating in the review of proposals. Table 1 shows the accepted ITAC members.

Table 1. Independent Technical Advisory Committee Members

Name	Title	Institution
David Allen	Professor and Director, AQRP	The University of Texas at Austin
Doug Boyer	Senior Air Quality Project Manager	TCEQ, Office of Air
Brad Pierce	Director, Space Science and Engineering Center	Univ. of Wisconsin-Madison
Don Collins	Professor	University of California, Riverside
Joost de Gouw	Research Physicist, Cooperative Institute for Research in Environmental Sciences (CIRES) Senior Scientist and Fellow	National Oceanic and Atmospheric Administration (NOAA), University of Colorado Boulder
James Nolan	Technical Specialist	TCEQ, Office of Air
Lea Hildebrandt Ruiz	Associate Professor	The University of Texas at Austin
Rebecca Sheesley	Associate Professor	Baylor University
William Vizuite	Professor	University of North Carolina
Yuxuan Wang	Associate Professor of Atmospheric Chemistry	University of Houston
Greg Yarwood	Principal	Ramboll Americas Engineering Solutions, Inc.
Renyi Zhang	Distinguished Professor of Atmospheric Sciences, Harold J. Haynes Chair in Geosciences	Texas A&M University

TCEQ Relevancy Review

The Texas Commission on Environmental Quality (TCEQ) reviews proposals for relevancy to the State's air quality research needs. TCEQ approval is required for a project to receive funding from the Program.

Advisory Council

The final group responsible for selecting Air Quality Research Program (AQRP) research projects is the Advisory Council (the Council). The Council consists of between 7 and 11 members. Two Council members with relevant scientific expertise are nominated by the Texas Commission on Environmental Quality (TCEQ). As defined in the AQRP contract, up to four members of the Council can be county judges from the Houston-Galveston-Brazoria (HGB) and Dallas-Fort Worth (DFW) non-attainment counties. Additional members should have a general background in air quality and business practices, and can include elected officials, business community representatives, environmental group representatives, and members of the general public. The Council's responsibilities are to attend meetings with TCEQ Management and the AQRP to understand the statewide project goals for the funding period, to select for funding the projects reviewed by the Independent Technical Advisory Committee (ITAC) and ranked by the TCEQ, and to assist with the presentation of project final results at locations throughout the state.

Table 2. Advisory Council Members

NAME	TITLE	INSTITUTION
Dan Baker	Senior Partner	Environmental Reaction Engineering Experts (E REX)
Beata Czader	Senior Technical Specialist	TCEQ, Office of Air
Andrew De Candis	Clean Cities & Clean Vehicles and H-GAC Cities Co-Director	Houston-Galveston Area Council (H-GAC)
Lyle Hufstetler	Clean Cities Coordinator	Alamo Area Council of Governments (AACOG)
Chris Klaus	Senior Program Manager	North Central Texas Council of Governments (NCTCOG)
Lindley Anderson	Senior Technical Specialist	TCEQ, Office of Air
Cyrus Reed	Conservation Director	Sierra Club

FINANCIAL STATUS REPORT

The Air Quality Research Program (AQRP) contract was extended for FY 26-27 for \$750,000 per year plus the carry forward of \$76,262.92. Funds were distributed across several different reporting categories as required under the contract with TCEQ. The reporting categories are listed below in detail.

Program Administration: Limited to 10% of the overall funding per fiscal year. This category includes all staffing, materials and supplies, and equipment needed to administer the overall AQRP. It also includes the costs for the Council meetings.

ITAC: These funds are to cover the costs, largely travel expenses, for the Independent Technical Advisory Committee (ITAC) meetings.

Project Management: Limited to 8.5% of the funds allocated for Contractual budget category. Each research project is assigned a Project Manager to ensure that project objectives are achieved in a timely manner and that effective communication is maintained among investigators in multi-institution projects. These funds are to support the staffing and performance of project management.

Research Projects / Contractual: These are the funds available to support the research projects that are selected for funding.

Program Administration

Program Administration includes salaries and fringe benefits for UT staff overseeing the program, as well as materials and supplies, travel, equipment, and other expenses. This category allows indirect costs in the amount of 10% of salaries and wages.

Dr. David Allen, Principal Investigator and AQRP Director, is responsible for the overall administration of the AQRP. RoseAnna Goewey, AQRP Program Manager, assists Dr. Allen with program and grant management.

The University of Texas at Austin's federally negotiated fringe rates for full-time/benefits eligible employees is 30.5%. Rates are estimated to have a 0.5% increase for full/part-time benefits eligible employees in subsequent years.

Table 3: Administration Budget - May 2026 (2026-2027 Biennium)

Budget Category	FY 26-27 Budget	Cumulative Expenditures	Remaining Balance
Personnel/Salary	\$87,092.27	\$35,346.10	\$51,746.17
Fringe Benefits	\$34,784.15	\$10,780.55	\$24,003.60
Supplies	\$3,769.00	\$117.45	\$3,651.55
Total Direct Costs	\$125,645.42	\$46,244.10	\$79,401.32
Authorized Indirect Costs (10% x Personnel/Salary)	\$8,709.23	\$3,534.62	\$5,174.61
Total Costs	\$134,354.65	\$49,778.72	\$84,575.93

ITAC

There are no ITAC expenditures in this reporting quarter. Table 4 details the 2026-2027 Biennium ITAC budget.

Table 4: ITAC Budget - May 2026 (2026-2027 Biennium)

Budget Category	FY 26-27 Budget	Cumulative Expenditures	Remaining Balance
Travel	\$10,000.00	\$0.00	\$10,000.00
Supplies	\$1,250.00	\$0.00	\$1,250.00
Total Direct Costs	\$11,250.00	\$0.00	\$11,250.00
Total Costs	\$11,250.00	\$0.00	\$11,250.00

Project Management

Table 5 details the 2026-2027 Biennium Project Management Budget. Expenses include Project Manager salaries, fringes, required supplies, and associated Indirect Costs. Project Manager assignments are listed in Appendix A.

Table 5: Project Management Budget – May 2026 (2026-2027 Biennium)

Budget Category	FY 26-27 Budget	Cumulative Expenditures	Remaining Balance
Personnel/Salary	\$102,105.00	\$7,181.87	\$94,923.13
Fringe Benefits	\$23,028.00	\$194.02	\$22,833.98
Supplies	\$8,038.00	\$0.00	\$8,038.00
Other	\$4,098.00	\$0.00	\$4,098.00
Total Direct Costs	\$137,269.00	\$7,375.89	\$129,893.11
Authorized Indirect Costs (10% x Personnel/Salary)	\$10,211.00	\$718.19	\$9,492.81
Total Costs	\$147,480.00	\$8,094.08	\$139,385.92

RESEARCH PROJECTS

Awarded research projects were selected during this reporting quarter. Table 6 shows the 2026-2027 Biennium Research Project budget. The initial budget allocated \$1,222,500.00 for research projects. Following approval of the carry-forward budget in December 2025, an additional \$60,678.27 was allocated to research projects, bringing the total Contractual/Research Projects budget to \$1,283,178.27. During the April 29, 2026 Advisory Council meeting, AQRD Director presented a proposal to reallocate \$12,534.73 from the Administration budget to the Contractual/Research Projects budget based on administrative cost efficiencies achieved during the biennium. The Advisory Council approved the reallocation, increasing the total Contractual/Research Projects budget to \$1,295,713.00 and allowing all recommended projects to be fully funded. The projects awarded during this reporting period are listed in Appendix A.

Table 6: 2026-2027 Biennium Contractual/Research Project Budget – May 2026

2026-2027 Biennium Total Contractual Funding		\$1,222,500.00		
FY 24-25 Contractual Carry Forward		\$60,678.27		
FY26-27 Administrative Budget Transfer		\$12,534.73		
TOTAL CONTRACTUAL BUDGET		\$1,295,713.00		
Project Number	Institution (PI)	Amount Awarded	Cumulative Expenditures	Remaining Balance
26-001	Baylor University (Sheesley)	\$61,304.00	\$0.00	\$61,304.00
26-001	University of Colorado, Boulder (Andrews)	\$53,001.00	\$0.00	\$53,001.00
26-001	University of Utah (Haller)	\$49,998.00	\$0.00	\$49,998.00
26-007	George Mason University (Tong)	\$160,470.00	\$0.00	\$160,470.00
26-015	University of Houston (Wang)	\$192,960.00	\$0.00	\$192,960.00
26-019	Ramboll (Shah)	\$230,849.00	\$0.00	\$230,849.00
26-029	The University of Texas at Austin (Misztal)	\$140,593.00	\$21.85	\$140,571.15
26-029	Texas A&M University (Zhang)	\$109,406.00	\$0.00	\$109,406.00
26-029	University of Colorado, Boulder (Malarich)	\$50,000.00	\$0.00	\$50,000.00
26-030	The University of Texas at Austin (Misztal)	\$247,132.00	\$0.00	\$247,132.00
FY 25 Total Contractual Funding Awarded		\$1,295,713.00		
FY 25 Contractual Funds Expended			\$21.85	
FY Contractual Funds Remaining to be Spent				\$1,295,691.15
Total Contractual Funding		\$1,295,713.00		
Total Contractual Funding Awarded		\$1,295,713.00		
Total Contractual Funding Contingency		\$0.00		
Total Contractual Funds Expended to Date			\$21.85	
Total Contractual Funds Remaining to be Spent				\$1,295,691.15

Appendix A. Contractual Research Projects Approved For Funding (Biennium 2026-2027)

Project #	Project Title	Research Priority	Primary Institution: PI	Collaborating Institution: Co-PI(s)	Total Budget	AQRP Project Manager	TCEQ Liaison
26-001	Longterm Trends in Dust Sources in West Texas	Trends in wind-blown dust (PM10 and PM2.5) in Texas	<i>Baylor University:</i> Rebecca Sheesley	<i>University of Colorado Boulder:</i> Elisabeth J. Andrew; <i>University of Utah:</i> Gannet Hallar	\$164,303	David Sullivan	Laramie Mahan
26-007	Characterization of International and Domestic Sources of Windblown Dust and Contribution to Fine and Coarse Particulate Matter in Texas	Trends in wind-blown dust (PM10 and PM2.5) in Texas	<i>George Mason University:</i> Daniel Tong	n/a	\$160,470	David Sullivan	Ari Brandt
26-015	Improving Urban Representation in High-Resolution WRF-CAMx Model and Evaluating the Effects on PBL and Ozone Prediction	Photochemical air quality models	<i>University of Houston:</i> Yuxuan Wang	n/a	\$192,960	Elena McDonald-Buller	Gabriel Lee
26-019	Advancing Assessment of NOx Emissions and Temporal Variability using TEMPO NO2 and CAMx	Improve emission inventories in nonattainment areas	<i>Ramboll Americas:</i> Tejas Shah	n/a	\$230,849	Elena McDonald-Buller	Benjamin Yusuf
26-029	Integrated Airborne-Mobile Ground Observations and Inventory for Enhanced VOC Source Attribution and Ozone Precursor Mapping in Texas	Improve emission inventories in nonattainment areas	<i>The University of Texas at Austin:</i> Pawel Misztal	<i>Texas A&M University:</i> Yue Zhang; <i>University of Colorado Boulder:</i> Nathan Malarich	\$299,999	David Sullivan	Morshad Ahmed
26-030	Advanced Analysis of Ozone Formation Potential, VOC Sensitivity, and Source Apportionment in the El Paso-Juarez Airshed	Further Analysis of Past Field Studies: Project 24-024	<i>The University of Texas at Austin:</i> Pawel Misztal	n/a	\$247,132	Erin Tullos	Erik Gribbin
Total Awarded					\$1,295,713		