



# United Latinos Green Team Preliminary Sacramento Air Quality Report

September 2022

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## Summary

United Latinos, Promoviendo Accion Civica Green Team presents a preliminary Air Quality Report for Sacramento in 2022. At the time of creating this report, United Latinos was the only grassroots community-based organization tackling air monitoring and air sampling in areas overlooked by current monitoring initiatives. This effort continues with many unanswered questions that are currently being explored.

In this preliminary report, you will be introduced to members of the Green Team. Though small, we are mighty and committed. Our team includes community activists, scientists, artists, students, and volunteers who want to make a difference. As you read through the background information in this report, you will understand where we started and where we are today.

In addition, you will notice preliminary information presented about our efforts at St. Rose Catholic Church and how historically, this area has been overlooked. St. Rose Catholic Church of Sacramento served as our pilot location where we began collecting data. During the second half of 2021, this initial effort led us to finding lead in our air samples. We ultimately determined the lead was likely emitted into the air by combustion. However, the lead levels were below the air quality thresholds determined by the USEPA, which led us to determine that St. Rose Catholic Church was not the ideal location to collect air samples in the pursuit of lead. Nevertheless, the Church continues to serve as a site of reference as we continue to expand our air monitoring efforts into other areas.

As we gained more experience with air monitoring and learned to maintain our equipment, we also looked to expand. We ultimately connected with residents of Mangan Park, situated north of executive airport. We met with their community, trained them on the processes of monitoring and placed an air monitor atop the pool house no more than 100 yards from the end of one of the executive airport runways. This effort began in the summer of 2022 and is still in progress.

Additionally, the United Latinos Green Team has expanded services to the Gardenland neighborhood along the Northgate corridor. Our volunteers and paid interns have helped install three additional monitors purchased specifically for this vicinity. This effort is only mentioned in this report to demonstrate our commitment to helping our neighbors throughout Sacramento achieve their goals and answer their questions.

The Green Team is committed to air monitoring in Sacramento. We will continue to partner with communities to empower them and grow future generations of community scientists. In addition to installing additional monitors, we will be working with community partners to drive locally driven strategies that can be presented to regional leadership with the objective of equitable sustainability. As Cesar Chavez said, "Society is made up of smaller groups, and as long as the smaller groups do not have the same rights and protections as others - I don't care whether you call it capitalism or communism - it is not going to work. Somehow, the guys in power have to be reached by counter power, or through a change in their hearts and minds, or a change will not come." This is ultimately what United Latinos strives for.

## Glossary

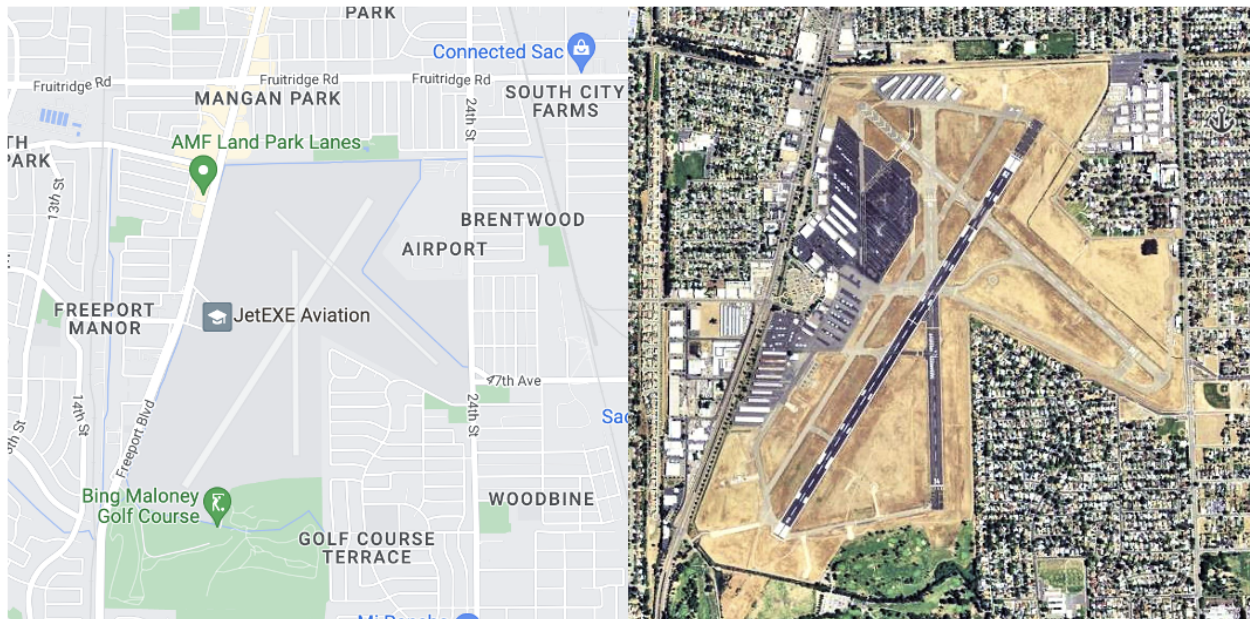
<b>AB 617</b>	This is a state bill that passed in 2017 that aims to address air pollution impacts in environmental justice communities. This legislation requires local air districts and the state Air Resources Board to reduce air pollution in these most impacted communities.
<b>ARA N-FRM</b>	Near US EPA Federal Reference Method Sampler, Manufactured by ARA
<b>dL</b>	dL is shorthand for deciliter, 1 Deciliter is equivalent to 0.1 Liter
<b>Environmental Justice</b>	A social movement aimed to address the unequal exposure of marginalized communities to negative impacts of climate change
<b>Micron</b>	Micrometer( $\mu\text{m}$ ), 10,000 $\mu\text{m}$ equivalent to 1 centimeter, 1 $\mu\text{m}$ is the same size as some bacteria.
<b>Pb</b>	Elemental abbreviation for lead
<b>PM 10</b>	Coarse particles between 2.5 -10 $\mu\text{m}$ . These particles include dust, pollen, and mold.
<b>PM 2.5</b>	Fine particles smaller than 2.5 $\mu\text{m}$ , include combustion particles and metals. PM 2.5 particles are near the size of spider web silk threads.
<b>TSP</b>	Total Suspended Particulate includes particles between 10-100 $\mu\text{m}$ , a human single human hair is 70 $\mu\text{m}$ .
<b>USEPA</b>	The United States Environmental Protection Agency (USEPA) is an independent executive agency of the United States federal government tasked with environmental protection matters.
<b>X-ray Fluorescence (XRF)</b>	A non-destructive analytical technique used to determine the elemental composition of materials.



## Background

This preliminary report is being authored through the Green Team, a long-term environmental justice campaign supported by United Latinos. United Latinos is a civic organization focused on promoting civic engagement especially among the Latino community. The name does not indicate exclusivity. Our mission includes empowering all disadvantaged communities. As a result, it was only fitting for the Green Team to begin our environmental justice work by honing in on air quality. Air quality is an issue that the Green Team decided to initially focus on due to movement in legislation, funding opportunities, public interest, and the opportunity to galvanize multiple disadvantaged areas in unity. Historically, neighborhoods where people with limited means also hosted industrial, governmental, and commercial facilities that polluted the air and water. As a result, people in these neighborhoods suffer increased environmental health burdens beyond those imposed by limited access to health care and health protection resources.

In recognition of these burdens, United Latinos has undertaken an air quality monitoring program to identify areas with elevated concentrations of combustion and toxic pollutants within disadvantaged communities. The first of a series of air quality monitoring campaigns has focused on that portion of South Sacramento adjacent to the boundaries of a similar campaign being administered by the Sacramento Metropolitan Air Quality Management District (SMAQMD) through the AB 617 Community Air Protection program funded by the California Air Resources Board. The South Sacramento AB 617 area extends generally from 47th Avenue to Sheldon Road, and from Franklin Boulevard to Elk Grove Florin Road. United Latinos focused on the neighborhoods to the north and west of the AB 617 area, including the neighborhoods of unincorporated South Sacramento, and have future sites to include Meadowview, and Hollywood Park. Within these areas of concern, significant emission sources include Highway 99 and I5, major arterial roads, truck yards, the Campbell Soup Power Plant, and the Sacramento Executive Airport. Emissions from these sources are not unique to the Sacramento metropolitan area, with the exception of those from the Sacramento Executive Airport. The Airport, as a general aviation airfield, is the single largest source of lead emissions in the Sacramento region. This is due to the fact that aviation gasoline for piston-driven aircraft is the only combustion fuel in the nation that still contains lead. As a result, the monitoring of lead concentrations near the airport became the first air quality monitoring goal of United Latinos.



*Figure 1: Aerial view of the Sacramento Executive Airport and map generated aerial view*

# Observations & Analysis

November 2021

This first phase of this campaign involved the installation of an ARA N-FRM monitor at St. Rose's Church on Franklin Boulevard. The Church is roughly downwind of the southern end of the Sacramento Executive Airport in the prevailing wind direction (from the southwest). The monitor was configured to capture PM<sub>2.5</sub> in order to directly compare the results to filters collected by the SMAQMD within the South Sacramento AB 617 area and filters collected by the California Air Resources Board (CARB) at their laboratory at 13th and T Streets near downtown Sacramento. Filters were collected on a 1-in-6 day schedule (Figure 1) coordinated with the U.S. Environmental Protection Agency (USEPA) monitoring calendar. The filter collection dates were October 13, 19, and 25, 2021.

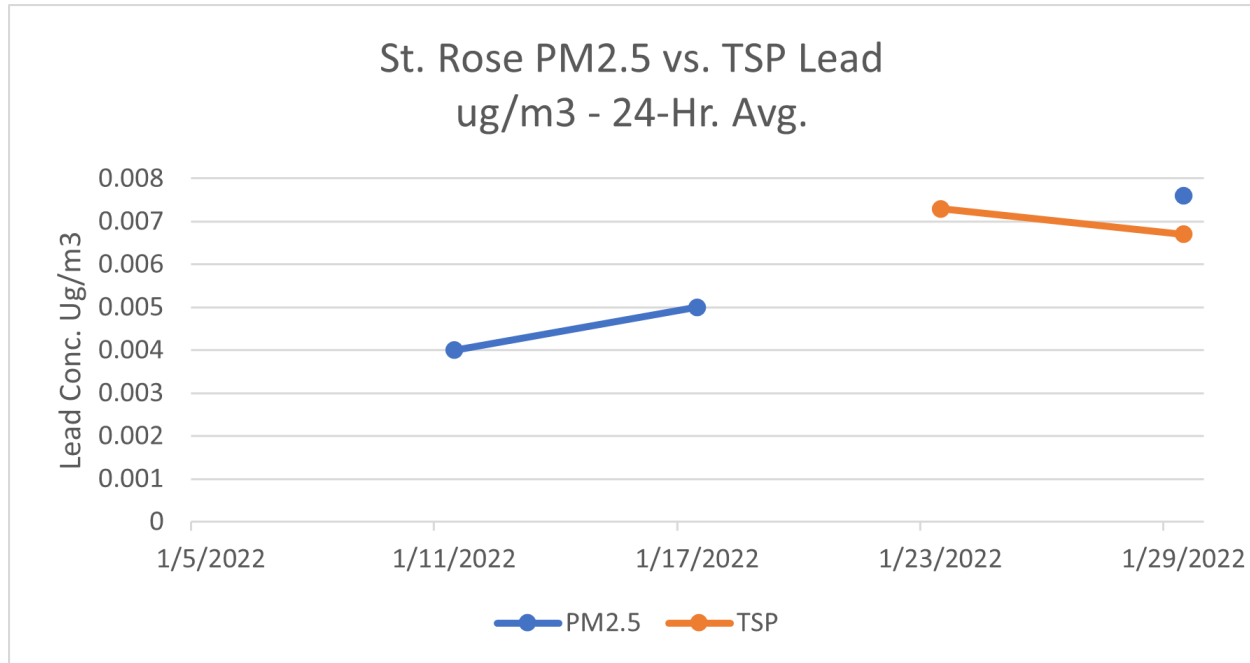
In each phase of this campaign, collected filters were analyzed by X-Ray fluorescence (XRF) by Chester Laboratories in Tigard, Oregon. Chester Laboratories specializes in inorganic chemical analyses - a significant portion of their work involves the analysis of air monitor filters. During this phase, Chester Laboratories reported that the lead content of each of the three filters was below the level of detection for XRF, which was 0.0014 ug/m<sup>3</sup>. By comparison, the USEPA ambient air quality standard for lead is 0.15 ug/m<sup>3</sup> on a 30-day rolling average. The USEPA standard is based on filters collected by a Total Suspended Particulate (TSP) monitor collecting particles smaller than 30 microns.

From these results, the monitoring team concluded that it would be best to begin collecting filters using a TSP inlet on the N-FRM monitor.

January 2022

In the second phase of this campaign, a second ARA N-FRM monitor was installed on the roof of the recreation center at St. Rose's Church and configured to collect TSP particles. This monitor was located adjacent to the N-FRM monitor with a PM<sub>2.5</sub> inlet. The two monitors were programmed to run together on the 1-in-6 day USEPA schedule during the month of January to compare the results of the PM<sub>2.5</sub> and TSP filters. The filter collection dates were January 5, 11, 17, 23, and 30, 2022.

Unfortunately, the TSP monitor did not run on the first three of these dates. After several attempts to reprogram the monitor, the monitoring team was advised by ARA to reinstall the factory programming, after which the monitor ran successfully during the last two monitoring dates. The lead contents of the filters collected during this phase are presented in the following graph. A table form of the data can be found in appendix [Item A](#).



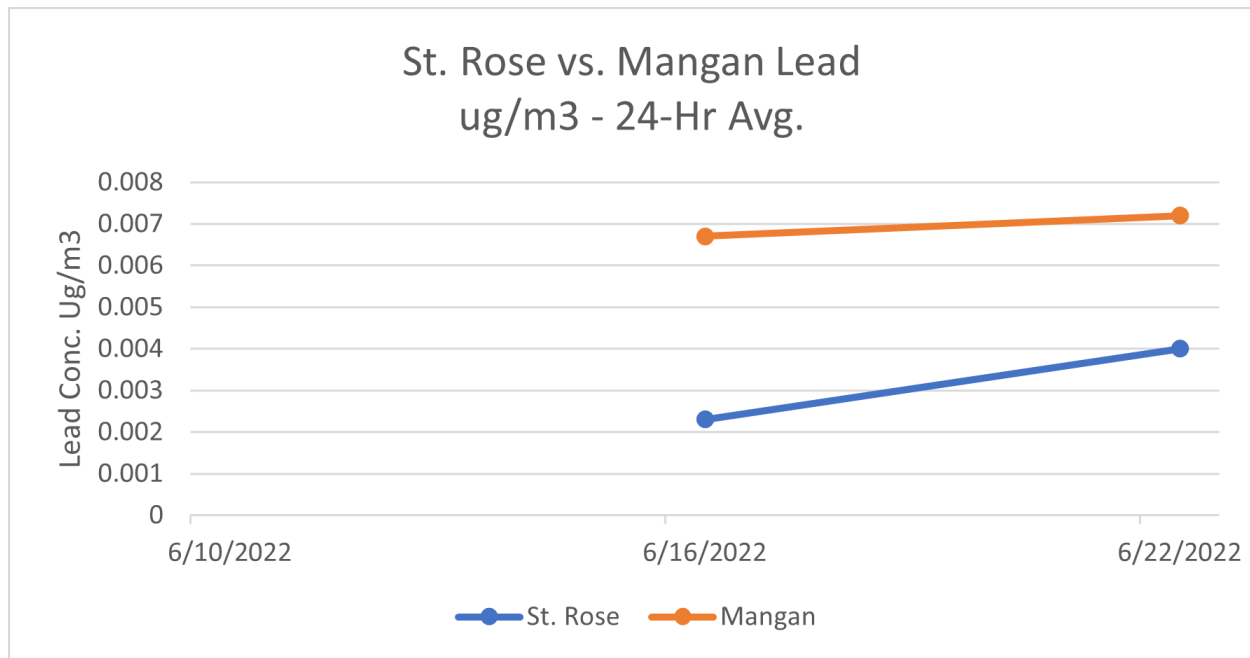
The PM2.5 lead values were reported to be above the analytical level of detection for three of the 5 samples. The highest value was 0.0076 ug/m3 which is about 5% of the USEPA air quality standard. Interestingly, the TSP lead value on January 29, 2022 was lower than the PM2.5 value even though 225% more particulate mass was collected by the TSP monitor than the PM2.5 monitor. This result suggests that most if not all of the lead in the sampled air was contained in PM2.5 particles and not in larger particles. This outcome also suggests that the collected lead derived from a combustion source such as aircraft exhaust as opposed to coarse particle dust.

From these results, the monitoring team concluded that the St. Rose site was not the best site for monitoring lead from the Airport and that a site closer to the Airport boundary might produce more elevated lead concentrations.

#### June 2022

The monitoring team identified a site within Mangan Park as the closest location to the Airport boundary downwind of the main runway. This site was on the roof of the pool building in the park. Use of this site required approval of the Mangan Park Neighborhood Association and the City of Sacramento Parks and Recreation Department. Upon receiving approval, one of the two N-FRMs mounted on the roof of the St. Rose's Church recreation center was relocated to the roof of the Mangan Park pool building. This monitor was configured to operate with a TSP inlet and run on a 1-in-6 day USEPA schedule for three days in June: 10, 16, and 22 of 2022. The remaining N-FRM monitor on the roof of the St. Rose's Church recreation center was also run on these three dates for comparison purposes.

The lead contents of the filters collected at the two monitoring locations are shown in the following graph. The data can also be viewed in table form in appendix [Item B](#).



The lead detection level (Pb DL) at Mangan Park on June 10, 2022, was exceptionally high because the monitor ran for only 2 hours due to an installation error. The lead levels at Mangan Park were substantially higher on June 16 and June 22, 2022, than at the St. Rose site. The highest concentration measured at Mangan Park, 0.0072 ug/m<sup>3</sup>, is about 5% of the USEPA 30-day rolling average air quality standard.

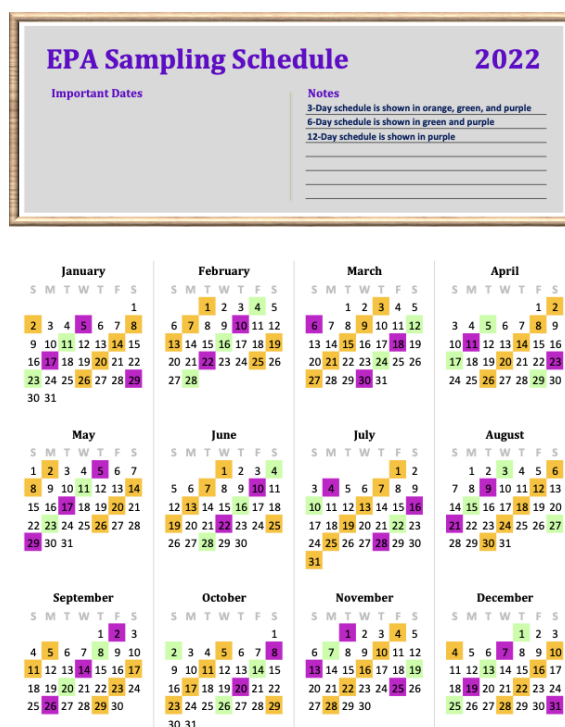


## Methodology

The ARA N-FRM monitor is a portable, battery-powered particulate sampler. ARA instruments is a designer and manufacturer of ambient air monitoring equipment. The “N-FRM ” means Near US EPA Federal Reference Method sampler. Despite not being EPA certified, it delivers FRM accuracy (Federal Reference Methods) for PM<sub>10</sub> and PM<sub>2.5</sub> at a fraction of the cost. This is critically important since we primarily work with neighborhood associations where cost can be a barrier. It completes a 24-hour sampling period utilizing only a battery—powered by solar energy. The air sampler draws ambient air at a constant flow rate of 16.7 liters per minute (LPM) (ARA Instruments, 2022). Assemblage involves establishing the monitor at each site making sure that all parts are in the right position and evaluating the best location to position the solar panel. In addition, it can simultaneously measure and log all real-time sampling parameters, meteorological data, and particulate counts.

When the series of testing begins, the sample dates must follow those of the Environmental Protection Agency (EPA) Federal Schedule (Figure 2). The schedule has been established by the EPA which is broken down to a 3-, 6-, or 12-day schedule. We follow this series of dates so we can compare our data with that of the Sacramento Metropolitan AQMD and the California Air Resources Board. The purpose is to create a baseline for our data and maintain a certain level of accuracy when conducting analyses.

There are three particle sizes that the ARA monitor can be configured to test: TSP (Total Suspended Particulate), PM<sub>10</sub>, and PM<sub>2.5</sub>. A pre-weighed filter cassette purchased from Chester Lab is utilized during the sampling process and is held in the filter holder which is 47mm in diameter. After each 24-hour sampling run, the filter is collected and is replaced with a new one. Once all samples in the series are collected, they are sent to Chester Lab for analyses and data reporting.



**Figure 2: Environmental Protection Agency (EPA) Sampling Schedule Calendar Schedule for TSP, PM<sub>10</sub>, PM<sub>2.5</sub>, and VOCs.**

Chester LabNet (CLN) is a small laboratory that specializes in inorganic air quality analyses. They are accredited by the Oregon Environmental Laboratory Accreditation Program (ORELAP), and was founded in 1977 (CHESTER LabNet, 2022). ORELAP accredits qualified laboratories for testing under the Clean Air Act (CAA), Clean Water Act (CWA), Resource Conservation and Recovery Act (RCRA), the Safe Drinking Water Act (SDWA) and other state and Federal regulations (Oregon Health Authority, 2021).

Lastly, the ARA monitors require monthly maintenance sessions which involves cleaning the airflow channels. Within the various sections of the inlet, there are O-rings that if damaged, need to be replaced. Once all components have been thoroughly cleaned, they need to be air dried and then reassembled. During this time, we also check to see if there are any firmware updates from the manufacturer. Upon completion of maintenance, the monitor is now ready to be deployed again. On an annual basis, the monitor is calibrated with an airflow sensor.

## United Latinos Green Team

The mission of the United Latinos Green Team is to educate and empower poor and marginalized communities to identify local environmental inequities and ensure environmental justice is achieved. This effort is achieved by harnessing environmental data, building multi-ethnic cross-generational coalitions, and engaging with the communities in focus through education and outreach. The work described in this report reflects the ongoing efforts to achieve this mission. Additionally, this work would not have been made possible without the financial and institutional support of United Latinos. The organization's 501c3 status along with the various connections to the community have allowed the Green Team to grow and serve as a credible voice in the larger environmental justice community.

### Meet the Green Team



Vince Valdez

Vincent Valdez is a lifelong Sacramentan graduate of McClatchy High and Sac City College. He participates on several committees and serves several organizations dealing with climate change and environmental justice. He is also the founding member of the Sacramento Climate Coalition and is very proud of all the work we've done together to bring a voice to these causes.



Richard Falcon

Richard is United Latinos' lead organizer and has fifteen years experience in community organizing. He is an appointed member of the Sacramento Police Review Commission (SCPRC), Chair of the UC Davis Staff Advisory Committee for Equity Diversity and Inclusion (SACEDI), President of the Artists of Color, active member of the Latinx Health Equity task force, active member of the Sacramento Latino Community Round Table, member of the City of Sacramento Task Force for Cultural Equity and the Arts, member of the Latinx Census subcommittee. He oversees community partnerships and collaborations with United Latinos, La Familia, Vida de Oro, and Latino Center of Art & Culture. He is also the owner and founder of Teatro Nagual; a social justice theater arts organization focusing on the core values of Cesar Chavez which calls for fostering service to others.



Alexis Arriaga

Alexis Arriaga is the President of United Latinos and is proud to be a member of the Green Team. Alexis is passionate in bringing forth the issues in the Latino and low income communities, such as environmental justice, through civic engagement, voter education, and performing arts.



Alexis is a strong proponent of the efforts made by the Green Team to close the environmental equity gap.



Kevin Fernandez

As a first-generation child of immigrant parents from El Salvador, Kevin's passion to fight for marginalized communities stems from personal struggle. He currently co-leads the effort in air quality data gathering in addition to managing the Green Team. Kevin is a graduate of the University of California Berkeley with a degree in chemistry and is currently fostering a career in data analytics in the healthcare sector.



Earl Withycombe

Earl Withycombe has worked as an air quality engineer since 1973. He has worked for the Sierra County Air Pollution Control District, Mountain Counties Air Basin, Sierra Research, and the California Air Resources Board. Earl has been a long time board member of Breathe California of Sacramento Region and the Environmental Council of Sacramento. He is currently providing pro bono air quality technical assistance to several Sacramento nonprofits engaged in environmental justice work, including United Latinos, Sacramento Area Congregations Together, and Green Tech Education and Employment Services.



Alex Sanchez

Alex is an undergraduate student at Sacramento State University majoring in Environmental Science and minoring in Biological Sciences. He started working with United Latinos in January 2022 as the Air Quality intern where he has supported various projects like the one in Mangan Park and Gardenland Northgate. After obtaining his bachelors, Alex wants to pursue a master's degree to build upon his air quality acumen and continue this line of work.



Jessica Barber

Jessica is a senior environmental studies student at Sacramento State University and is also participating in the United Latinos internship focused on air quality.

## Meet Our Partners

### St Rose Catholic Church of Sacramento



St Rose Catholic Church has graciously allowed us to install and maintain our first air monitor stationed atop the church's Kavanaugh Center. Father Beltran has been extremely supportive of our efforts to plant trees and monitor the air in South Sacramento.

### Mangan Park Neighborhood Association



The Mangan Park Neighborhood Association has been key in coordinating our efforts to place a monitor on top of the pool house in Mangan Park.



### Gardenland Northgate Neighborhood Association

The Gardenland Northgate Neighborhood Association has been enthusiastic and supportive of the Green Team air monitoring efforts in their community. We are currently collaborating on air monitoring efforts.

### Catalina Serrano Bucheli



Catalina is the artist behind the Green Team's air monitoring coloring book. She is also an actor and Sacramento State University graduate!

### Sacramento Tree Foundation



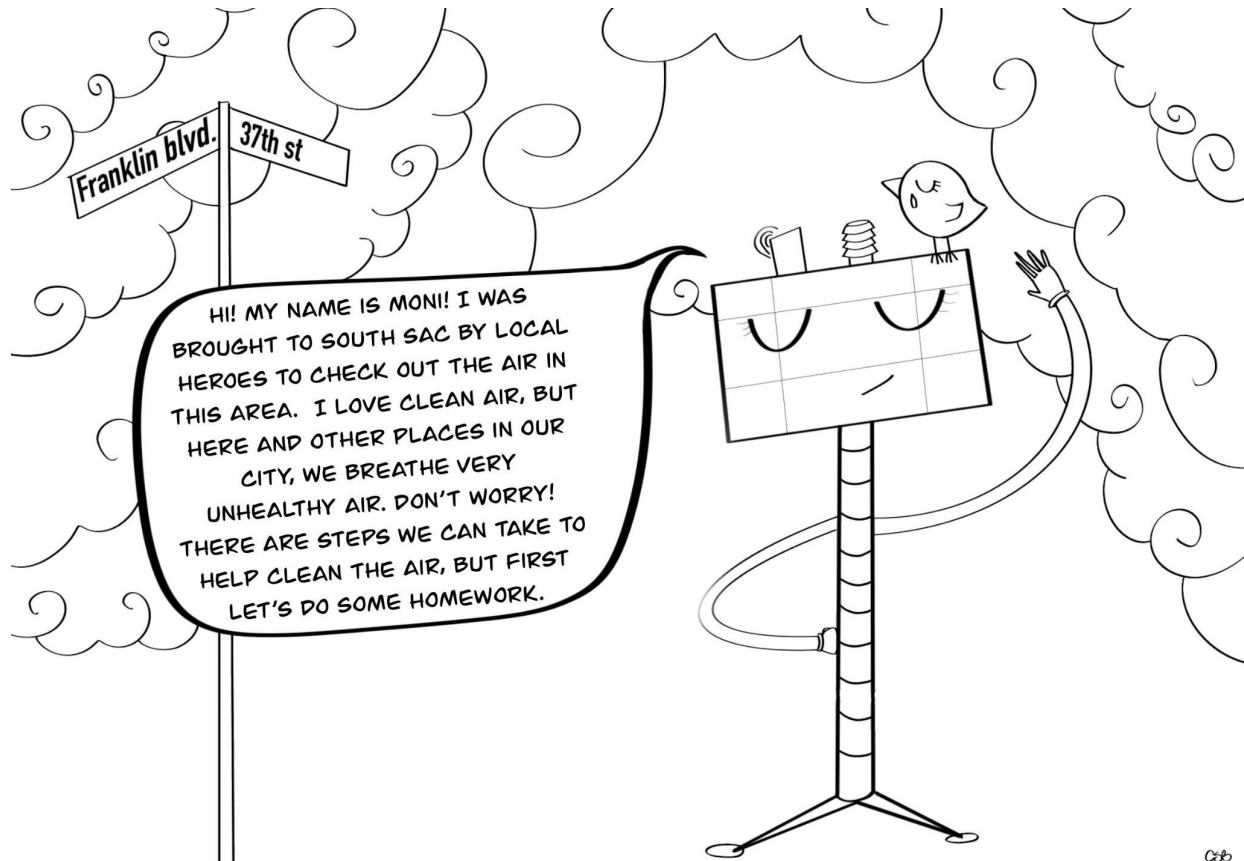
The Sacramento Tree Foundation has supported us by providing training, trees and materials to plant trees in the Sacramento region to combat air pollution.

## Outreach & Educational Efforts

The Green team has proudly hosted and participated in several outreach and educational activities that aimed at increasing awareness around air quality.

### Art

The air quality coloring book! Approximately 1,000 copies have been distributed so far.



### Training

Air Monitoring 101 - this training is geared towards teaching the community on what air monitoring is and how they can participate.

## Green Team – Air Monitoring 101

### Agenda

Air Quality Principals & Definitions

Air Monitor Operation

Q&A



Mangan Park  
community  
member Air  
Monitoring 101  
training days 1  
and 2.



## Community Outreach

Indoor Air Filter DIY  
workshop. We built 100  
indoor air filters and  
distributed them to at-risk  
elderly and families through  
community serving  
organization







Sacramento  
Earth Day at  
Southside  
Park

Tree Plantings  
at St Rose  
Catholic  
Church & the  
Asian  
Resource Inc  
grounds.



## Next Steps

At the time of writing this report, the Green Team is continuing to sample the air at the Mangan Park location with a TSP PM 30 inlet. This work will continue until the end of September 2022. This will be followed by another round of PM2.5 inlet sampling and possibly installing another NFRM monitor at a site upwind of the executive airport for a true control reading.

At the time of writing this report the Gardenland Northgate Neighborhood Association has commenced air monitoring. The United Latinos Green Team will help complete a quarterly report for the association leading the initiative.

Furthermore, United Latinos in partnership with Breathe Sacramento, Valley Vision, and Health Education Council have all begun a project to monitor specific vehicle emission matter including sampling the air in four identified underserved environmental justice zones. The findings will aim at correlating air quality data with health issues in the same communities.

United Latinos Green Team has also committed to planting trees in partnership with the Sacramento Tree Foundation and various community groups.

Lastly, the Green Team will continue to educate communities about air monitoring and expand its use of the ARA-NFRM into other neighborhoods in Sacramento.

# Appendix

## Item A

Site	Sample Date	Part. Size	Pb	Pb dL
St Rose	1/5/2022	PM2.5	< dL	0.0014
St Rose	1/11/2022	PM2.5	0.004	0.0014
St Rose	1/17/2022	PM2.5	0.005	0.0016
St Rose	1/23/2022	PM2.5	< dL	0.0014
St Rose	1/23/2022	TSP	0.0073	0.0018
St Rose	1/29/2022	PM2.5	0.0076	0.0021
St Rose	1/29/2022	TSP	0.0067	0.0016

## Item B

Site	Sample Date	Part. Size	Pb	Pb dL
Mangan	6/10/2022	TSP	< dL	0.0096
St Rose	6/10/2022	TSP	< dL	0.0014
Mangan	6/16/2022	TSP	0.0067	0.0014
St Rose	6/16/2022	TSP	0.0023	0.0011
Mangan	6/22/2022	TSP	0.0072	0.0018
St Rose	6/22/2022	TSP	0.004	0.0015