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The Community Air Project: San Bruno Report Executive Summary

Disadvantaged communities in California are disproportionately burdened by air pollution, yet often lack the localized data needed to inform local decision-making. This study addresses that gap in San Bruno, a designated Environmental Justice Community suffering from significant environmental disparities and ranked in the 74th percentile of pollution burden according to CalEnviroscreen. Employing a community-based participatory research approach, this project from UC Davis in collaboration with Rise South City, a local, community-based organization, deployed novel air quality sensor technology to identify metallic compounds in ambient air.

To this end, the Toxic-Metal Aerosol Real-Time Analysis (TARTA) instrument was deployed at six sites selected in partnership with Rise South City and community members. TARTA provides high-resolution, hourly data on metallic compounds in particulate matter, a significant advancement over traditional cost-prohibitive or less mobile methods. This approach provides empirical, ground-level data that fills in a gap which wider regional monitoring networks are not yet able to address.

Monitoring revealed the presence of seven metallic compounds in San Bruno's ambient air: **aluminum (Al), copper (Cu)**, **iron (Fe)**, **magnesium (Mg)**, **vanadium (V)**, **zinc (Zn)**, and **manganese (Mn)**. Aluminum, Copper, Iron, and Zinc were found at all six sampling sites. Manganese was found at four sites, Magnesium at five sites, and Vanadium at two sites. The detection of manganese is a critical finding, as it is regulated as a Hazardous Air Pollutant (HAP) due to its known health risks.

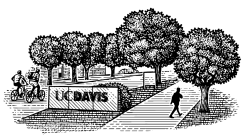
Identifying metallic compounds can also help fingerprint different emission sources. Magnesium traces may reflect marine aerosol input due to proximity to the bay. **Vanadium** is a tracer for oil or jet fuel combustion, suggesting contributions from refinery or airport emissions. Co-tracing of elements also suggests possible emission sources. **Cu+Zn** suggests non-exhaust traffic wear (brake and tire abrasion) and may also reflect light industrial metalworking. **Al+Fe** points to construction dust or cement plant emissions. **Mg+Al** supports a cement/ concrete dust origin. Iron & Steel metallurgy (ferro-alloy plant) seems to be the most likely source of the Mn.

The findings from this analysis can help inform relevant authorities in their decision-making, enforcement of regulations, and devising relief efforts for the impacted community.

Based on this research, we recommend the following next steps:

- **Targeted Monitoring Expansion**: Deploy monitors in communities in areas identified as concerning by residents and near potential sources (e.g., industrial, mobile).
- **Informed Regulatory Decision-making**: Advocate for continuous, or more frequent monitoring for manganese and other HAPs.
- **Support Research**: Support of additional research into air quality monitoring particularly into the unknown health effects of exposure to pollutants, including metallic compounds.

Please find the full report and more project information at https://communityair.ucdavis.edu/.



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