EPA OAQPS Air Monitoring Report

Clean Air Act Advisory Committee
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EPA Monitoring Activities – What we do

- Provide financial assistance
  - Annual program funding (CAA s. 105)
  - Special funding opportunities (CAA s. 103) – e.g., Community Scale Air Toxics Monitoring Grants, American Rescue Plan Grants/Direct Awards
- Provide technical support
  - Issue air monitoring guidance and regulations
  - Assist SLT monitoring activities, including lab support
  - Support/maintain data systems (e.g., AQS)
  - Conduct data analyses and prepare reports (e.g., Annual Trends Report)

EPA Monitoring Activities – What we do

- Regulatory action
  - Issue CAA s. 114 request to collect certain data
  - Upgrade monitoring, recordkeeping and reporting requirements in EPA rule – e.g., fenceline monitoring in Refinery Rule
- Conduct monitoring methods research in conjunction with ORD and Regional Offices

Enhanced Air Quality Monitoring Under the American Rescue Plan

ARP Background

The American Rescue Plan (ARP) provides $100 million for the EPA to address health outcome disparities from pollution and the COVID–19 pandemic; $50 million targeted specifically to advance environmental justice **and $50 million for enhanced air quality monitoring**.

ARP Background

$50M to enhance air quality monitoring is divided into the following components:

1. Grant Competition for Community Monitoring ($20M)
2. Direct Awards to Air Agencies for Continuous $PM_{2.5}$ Monitoring and Other NAAQS Pollutants ($22.5M)
3. Enhanced Regional Capacity for Short-term Community Monitoring Needs ($5M)
4. Administrative Support ($2.5M)

Grant Competition for Community Monitoring ($20M)

- The funding is for eligible entities to conduct ambient air monitoring of pollutants of greatest concern in communities with environmental and health outcome disparities stemming from pollution and the COVID-19 pandemic.

- The goals of the competition:
  - Enhance air quality monitoring in and near underserved communities across the United States.
  - Support community and local efforts to monitor their own air quality and to promote air quality monitoring partnerships between communities and tribal, state, and local governments.

Grant Competition: Funding Amounts

- Estimated total funding - **$20 million**
- Maximum funding requested per application
  - **$25,000 to $100,000** 'Small Grants' (approx. 20-30 awarded)
  - **$100,000 to $500,000** 'Large Grants' (approx. 30-40 awarded)
  - Should be commensurate with the proposed activities
- Set-asides:
  - Approximately **$2 million for tribal governments**
  - Approximately **$2 million for community-based organizations**
  - Applications for each set-aside will be reviewed and ranked separately
  - EPA may increase or decrease the amounts and number of projects selected under each set-aside based on the number of meritorious applications received, agency priorities, funding availability, and other applicable considerations

Grant Competition: Who Can Apply?

Applications will be accepted from

- States (including the District of Columbia)
- Local governments
- U.S. territories and possessions
- Indian tribes
- Public or private nonprofit organizations
- Public and private hospitals and laboratories

- Note that eligible entities can partner with ineligible entities under EPA's Subaward Policy: https://www.epa.gov/grants/grants-policy-issuance-gpi-16-01-epa-subaward-policy-epa-assistance-agreement-recipients.

Resources

- RFA at: https://www.epa.gov/grants/enhanced-air-quality-monitoring-communities
  - Applications due Friday, **March 25**, **2022** 11:59PM ET, via Grants.gov: https://www.grants.gov/web/grants/view-opportunity.html?oppId=336951
  - Submit questions via email to AirMonitoring@epa.gov by **March 18th, 2022**
  - RFA Information Session Recording with Full Set of Slides is available at https://www.epa.gov/grants/enhanced-air-quality-monitoring-communities
  - Introduction to EPA Grants Webinar is available at https://www.epa.gov/arp/enhanced-air-quality-monitoring-funding-under-arp

Direct Awards ($22.5M): Allocation Priorities and Considerations

Priority Funding:

Upgrade $PM_{2.5}$ Federal Reference Methods (FRMs) to continuous Federal Equivalent Methods (FEMs).

Other Considerations*:

***Prioritize investments in and near communities with EJ concerns.**

- Upgrade other NAAQS pollutant monitoring sites.
- Upgrade certain NAAQS gas monitors and/or equipment not meeting performance or completeness goals.
- Other possible PM monitoring investments.

Enhanced Regional Capacity for Short-term Community Monitoring Needs ($5M)

- EPA is investing $5 million in agency mobile monitoring capabilities or air sensor loan programs.
- These investments will improve EPA's ability to support communities in need of short-term monitoring and air quality information.

Fenceline Monitoring Applications, and Measurement Technology

Fenceline Monitoring Requirement for Petroleum Refineries

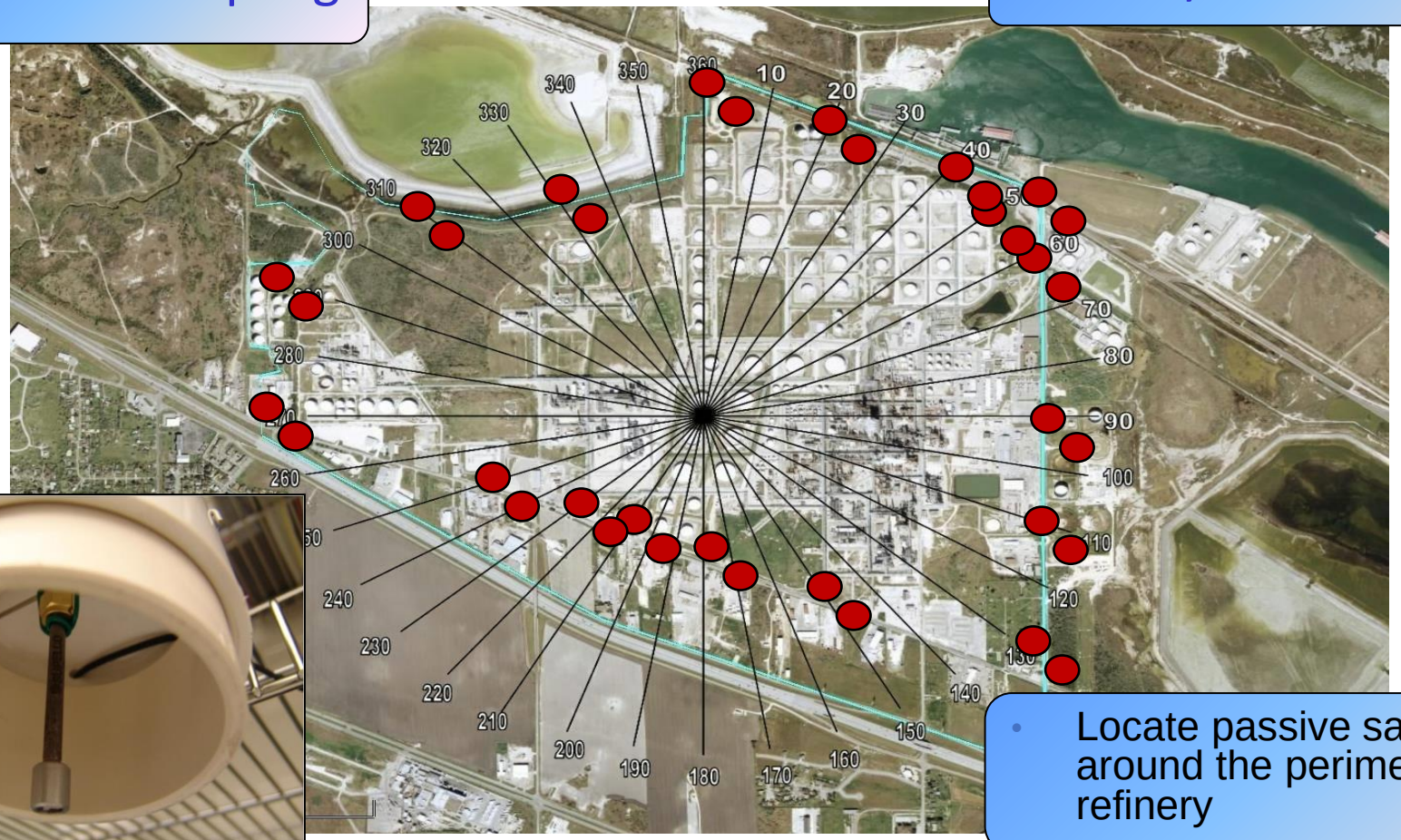
@corbis

- Fenceline Monitoring Work Practice in the Refinery NESHAP.
  - Established requirement to monitor benzene along the perimeter of US refineries.
  - Required a specific method for sampling and analysis of benzene (Methods 325A/B).
  - Reporting requirements for the monitored data.
  - Set an “action-level” at the fenceline and required analysis and corrective action when this “action-level” was exceeded.

Passive Fenceline Monitoring – EPA Method 325A/325B

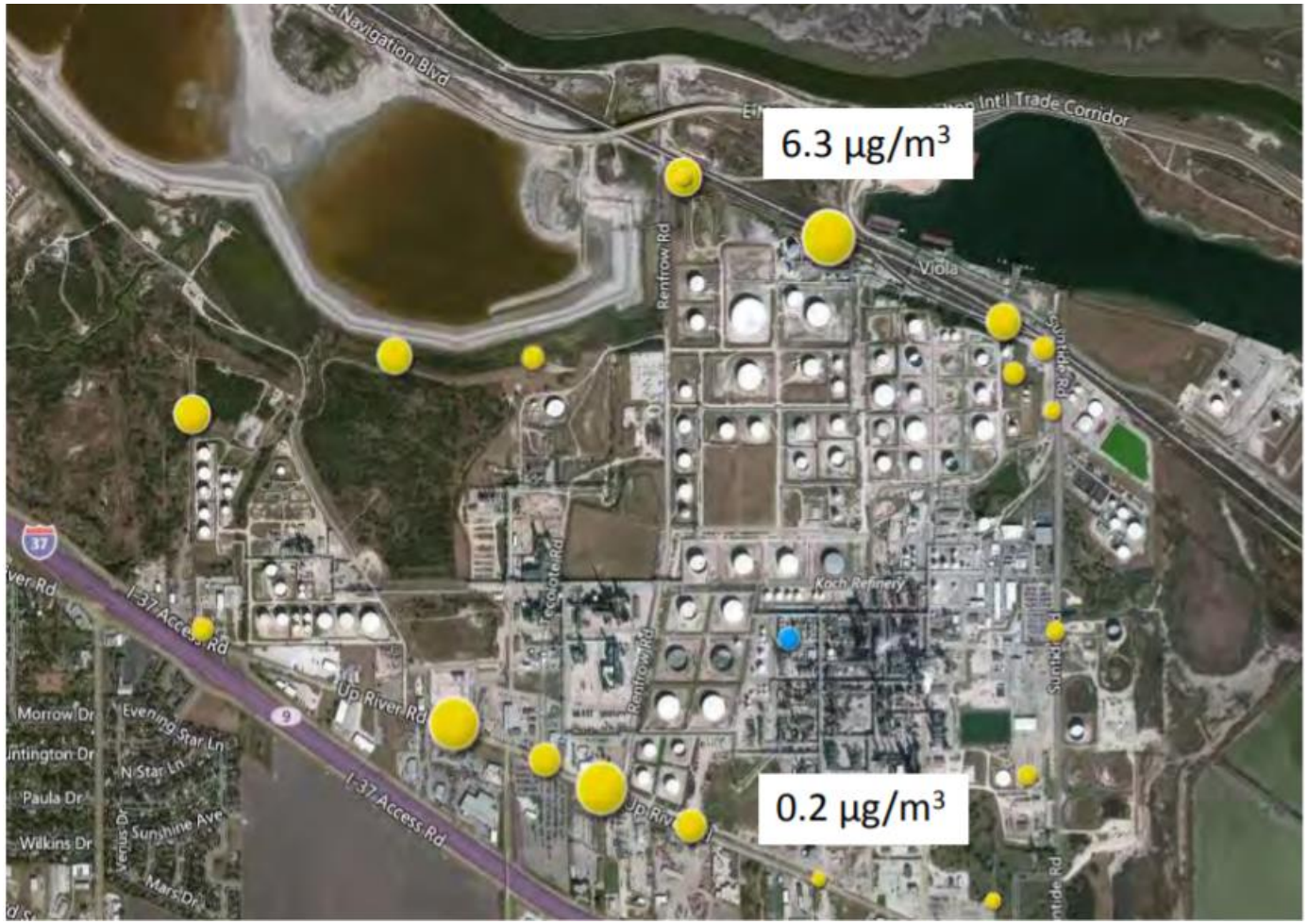
Passive Sampling

- Facility fenceline monitoring



- Locate passive samplers around the perimeter of each refinery

What is an action level for Fenceline Monitoring?



2-Week average readings

ΔC = High Value – Low Value
High Value – 6.3 ug/m³
Low Value – 0.2 ug/m³
ΔC = 6.1 ug/m³

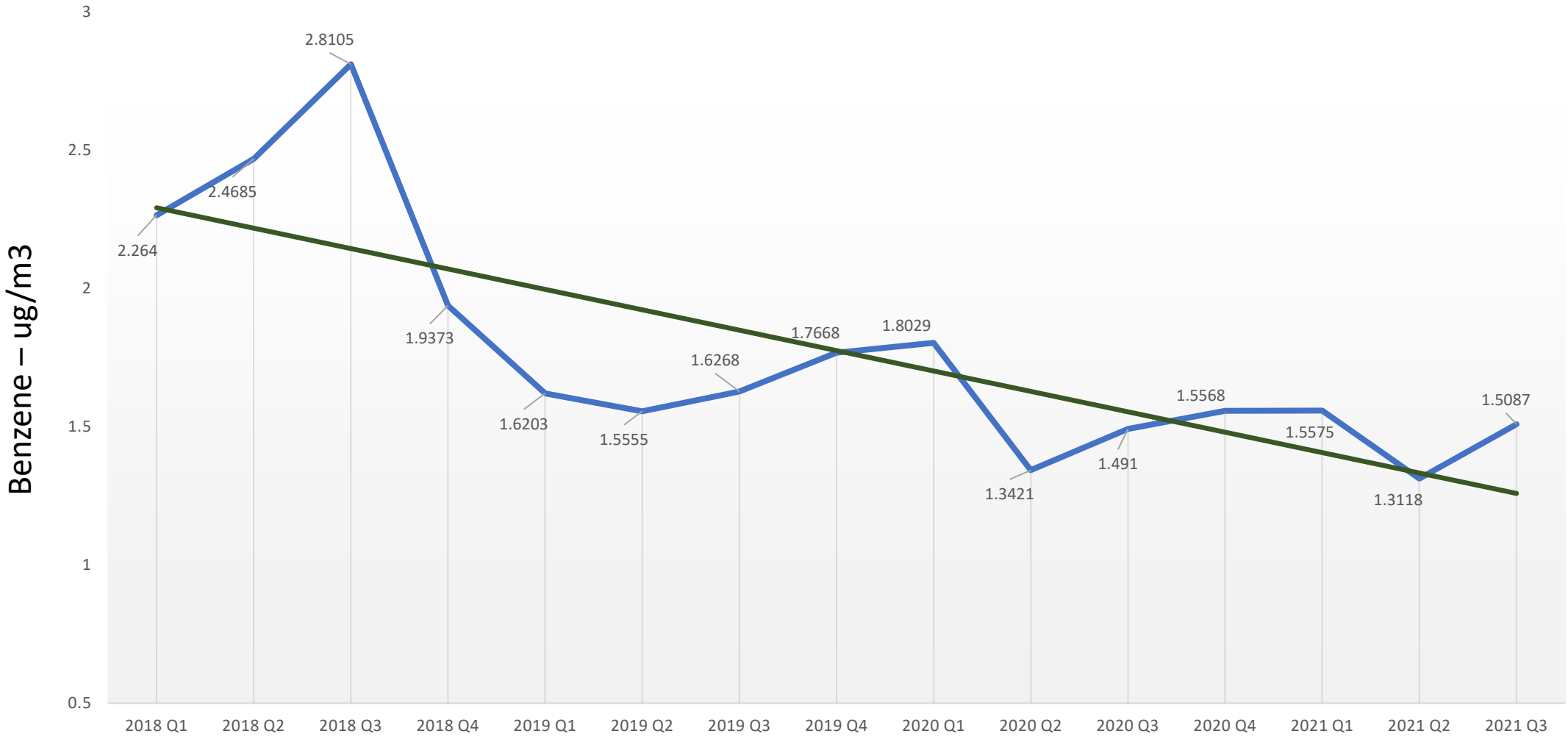
Annual average ΔC -
The average of the most recent 26 ΔC values.

Action level in the refinery rules is an annual average ΔC concentration of >9 ug/m³.

Work Practice Associated with Fenceline Monitoring

- Root Cause Analysis and Corrective Action upon exceeding an established benzene action-level along the perimeter of these facilities.
  - Time thresholds for investigation and corrective actions.
  - Submission of corrective action plan to EPA if exceedance persists or repair completion is delayed.
- Benefits from this approach
  - Fenceline monitors are at ground level and capture VOC/HAP emissions emitted from fugitive sources (e.g., storage tanks, wastewater collection systems, equipment leaks, etc.).
  - These are typically the sources that are most difficult to quantify using standard methods and make up the vast majority of emissions of VOC and HAP at chemical plants and refineries.
  - Emission reductions sooner and outside of prescriptive fugitive program.

Industry Wide Average ΔC since 2018



Fenceline Monitoring in Other Sectors

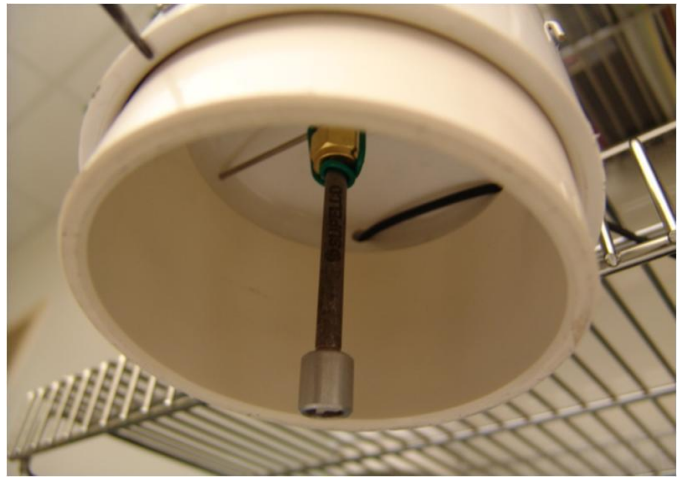
- What fugitive emission source(s) is of concern;
- What pollutant(s) to measure related to fugitive emissions;
- What measurement technology is feasible; and
- What type of action level to “trigger” further action is most appropriate?

Measurement Considerations

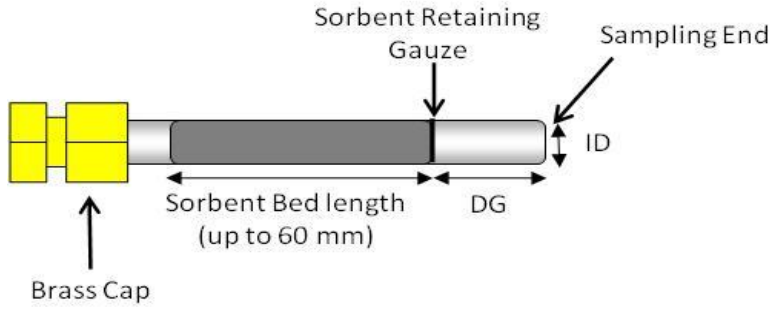
- Sensitivity requirements could be dependent on ambient background, modeled concentrations at the boundary line, inhalations unit risk estimate, or other factors.
- The more reactive and volatile a compound, such as formaldehyde or ethylene oxide (EtO), the more difficult it is measure at very low concentrations (*e.g.*, “risk level” concentrations).
- Cost of deployment and ease of use.
- Recent development of next generation emissions monitoring tools with potential application to fenceline monitoring.

Fenceline Measurement Tools – Integrated Approaches

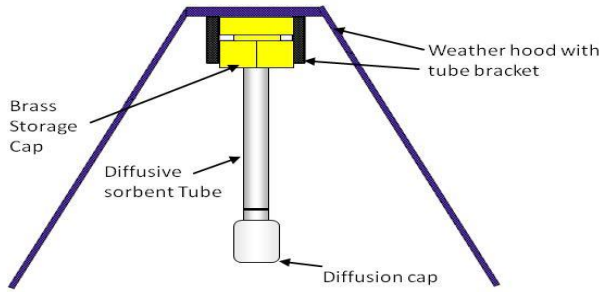
- Passive Sorbent Tube (EPA Method 325A/B)
  - Provides a single measurement for the sampling period (1 to 14 days)
  - Low cost
  - Based on an absorbing sorbent which undergoes thermal desorption and cryogenic concentration and measurement by GC/MS
  - Efforts underway to expand the analyte list for this method



PS Sampler Example
PVC Pipe version with weatherproof hood



Cross Section View of Passive Sorbent Tube



PS Tube Sampler

Fenceline Measurement Tools – Integrated Options

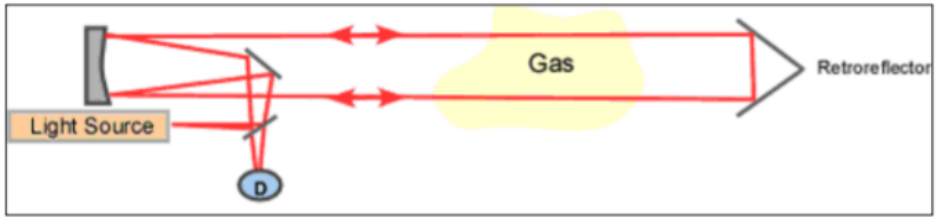
- Reactive/Coated Sorbents
  - Based on sorbents that react and "lock" compounds that are reactive and/or volatile (*e.g.*, formaldehyde, EtO, vinyl chloride).
  - Wet chemistry and solid extractive concentration, which can cause sensitivity issues and increase cost.
  - Existing approaches for ambient measurements of formaldehyde (*i.e.*, EPA Method TO-11), and we are undertaking work for EtO applications.
- TO-15/TO-15A
  - Time-integrated ambient measurement method that includes a target list for 97 VOCs.
  - Utilizes specially lined canisters for sampling. Time integration sampling is typically 1 day and usually requires off-site laboratory analysis.

Real-Time Monitoring Options – Point Monitors

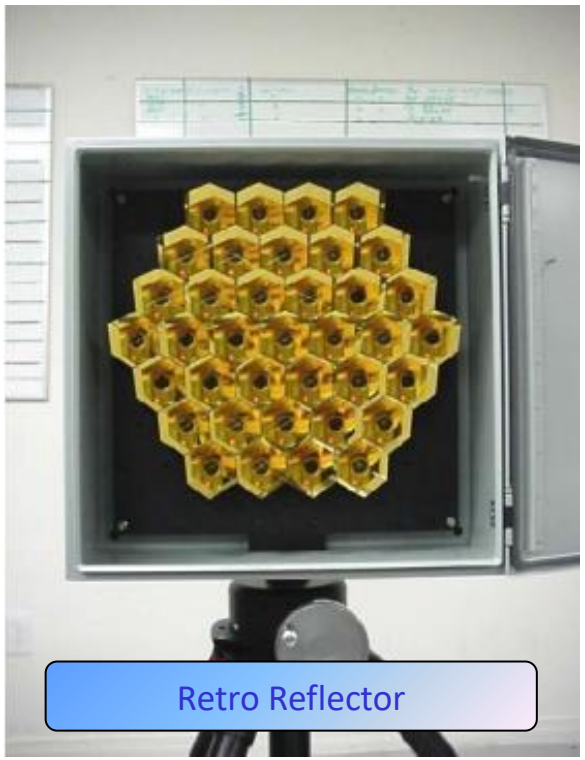
- General: SPoD are lower cost “VOC” continuous monitors capable of low concentrations, integrated with real-time meteorological (met) data, to allow for targeting areas of potential emissions.
- General: Lower cost “VOC” sensors may not have the desired sensitivity for many of the problematic compounds such as EtO.
- Speciated air toxics approach: Realtime optical instrumentation (*e.g.*, CRDS, QCL, FTIR). wide range of capability and applications.
  - Newest set of technologies being applied to air toxics work, and have the desired sensitivity for many of the problematic compounds.
  - Higher cost but application provides real-time data.
  - Mature technology that has been applied to point-source measurement for a while.
  - Application to fenceline as a fixed monitor or multi-point extractive system.

Real-Time Monitoring Options – Open Path

- Open Path FTIR and UV-DOAS
  - Realtime measurement of a large set of air toxics (both inorganic and organic).
  - Costly to implement and generally lacks the sensitivity to measure for long term chronic risks.
  - Measurement can be confounded by complex air sheds.
  - Is being applied to fenceline measurements in California.
  - EPA has done extensive research work in this area over the past 20 years and has a Toxic Organic method for open-path FTIR (EPA Method TO-16).




(FTIR) Transmitting and Detecting Unit


Retro Reflector

Thank You and Questions?