

Refinery Emergency Air Monitoring Assessment Project



**Monitoring and Laboratory Division
Office of Emergency Response**

**PQAO Training
January 26, 2017**

Chevron Richmond Fire

August 6, 2012

- Catastrophic pipe failure
- High-temperature flammable fluid released and partially vaporized into a large cloud
- Vapor cloud engulfed 19 employees
- Vapor cloud ignites
- All 19 employees narrowly avoided serious injury or death

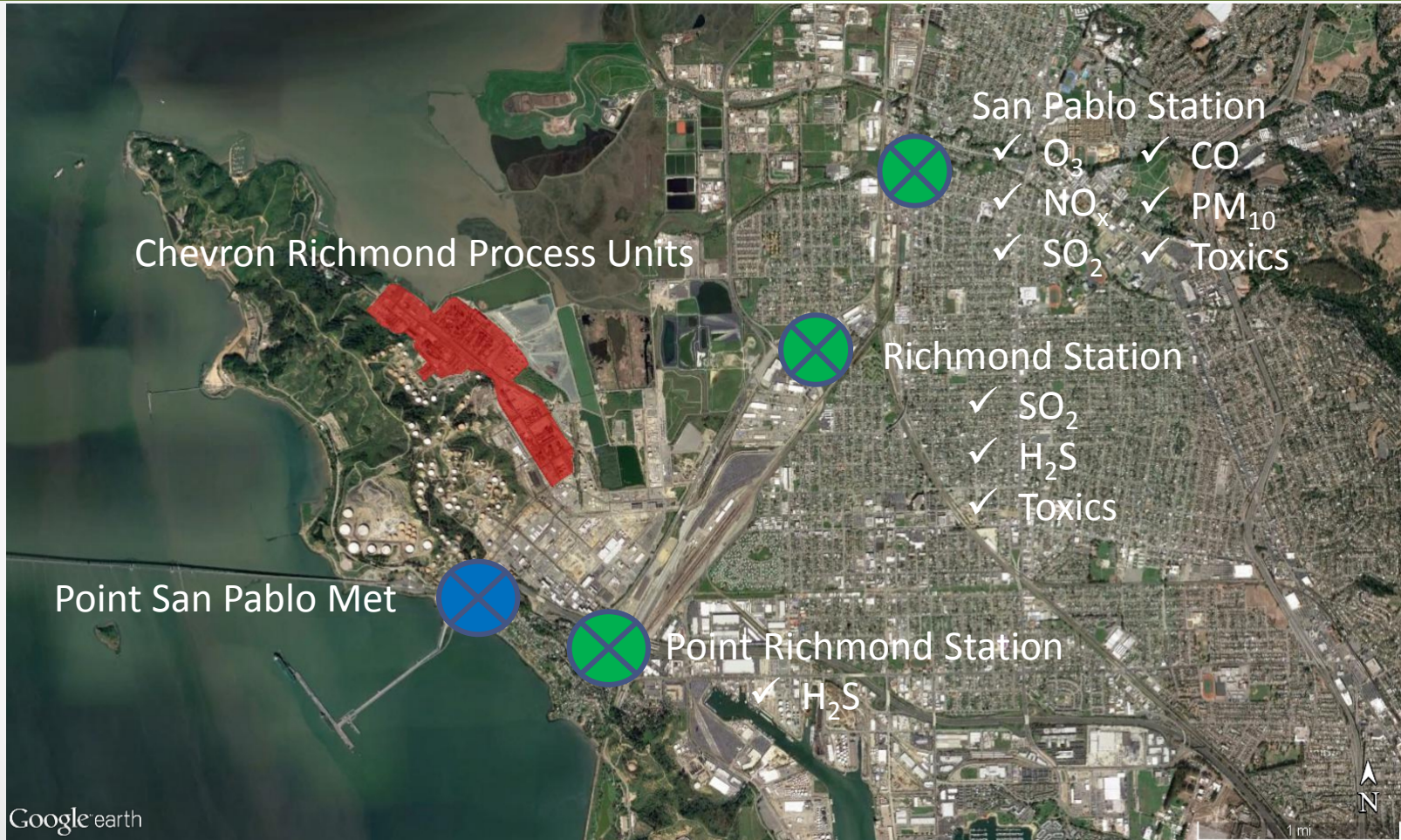


Public Exposure

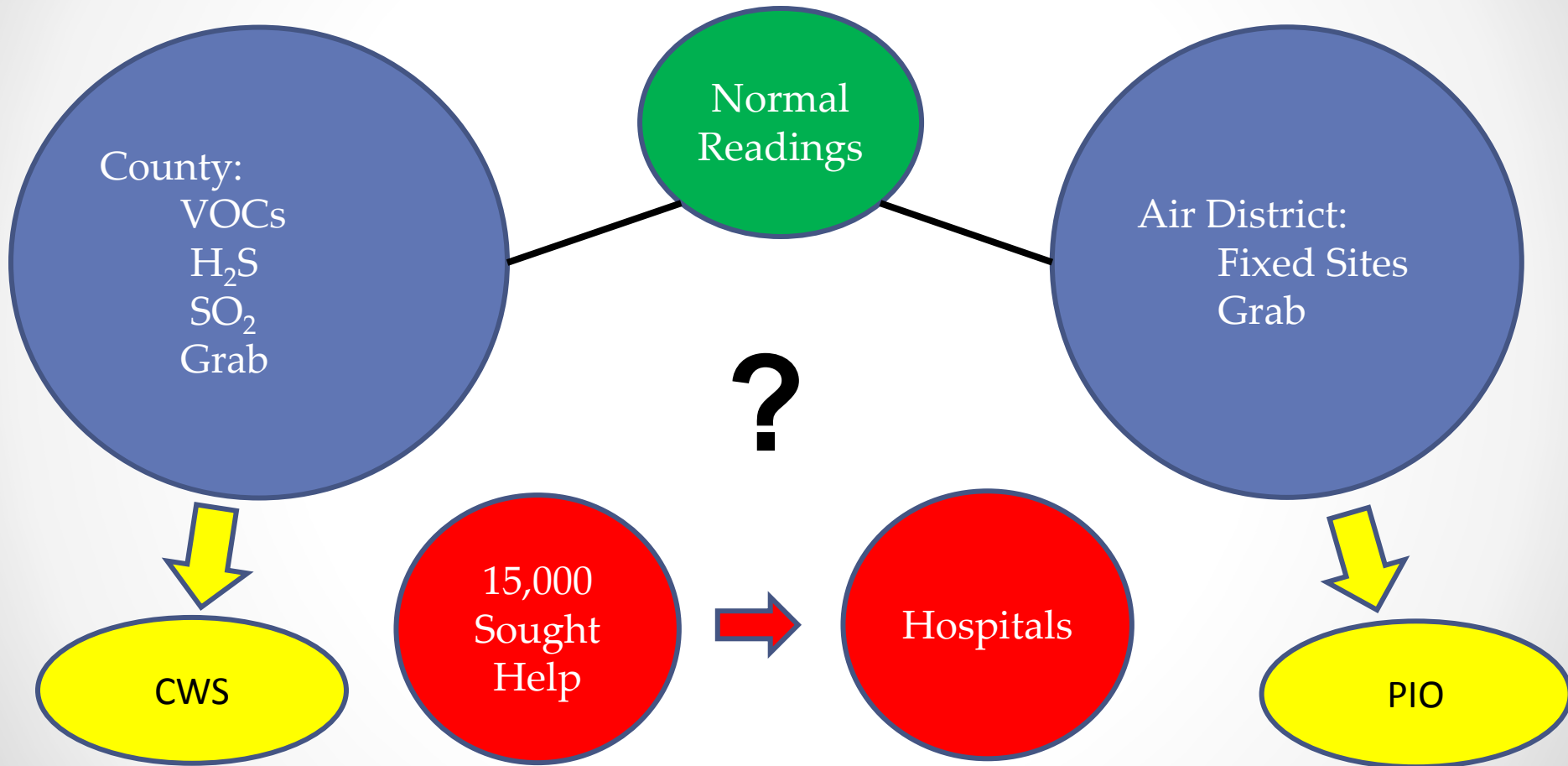


15,000 people in the surrounding communities sought medical attention

Richmond Monitoring Stations



Monitoring Results - Disconnect



Response Roles



Coordination with Air Districts



San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT



**BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT**

ExxonMobil Refinery Explosion

February 18, 2015

- Torrance refinery electrostatic precipitator at catalytic cracking unit explodes due to overpressure
- Spent catalyst, fiberglass, and glass wool rain down into surrounding neighborhoods
- Four contractors injured
- CalOSHA shuts down the affected unit



ExxonMobil Refinery Explosion

- South Coast AQMD deployed various instruments to sample ambient air and collect fallout samples for analysis
- SCAQMD sampling conducted independent of sampling by the Unified Command
- Some sampling sites not located downwind from incident site



Refinery Incidents

Lessons Learned:

- Improvement in fixed and response air monitoring needed
- Air district role needed in emergency planning
- Better coordination needed between air districts and responders

Scope of the Issue

- 17 refineries in four districts
SCAQMD(8) BAAQMD (5) SJVAPCD (3) SLOAPCD (1)
- Fire, Hazmat, Public health responses are critical
- State regulation vs. local control



Refinery Assessment Plan

- Inventory: **Completed**
- Assessment: **Draft Report**
- Guidance
- Coordination, training, and preparedness program



**Air Monitoring for Accidental Refinery Releases:
Assessment of Existing Capabilities and Potential
Improvements**

Prepared by:

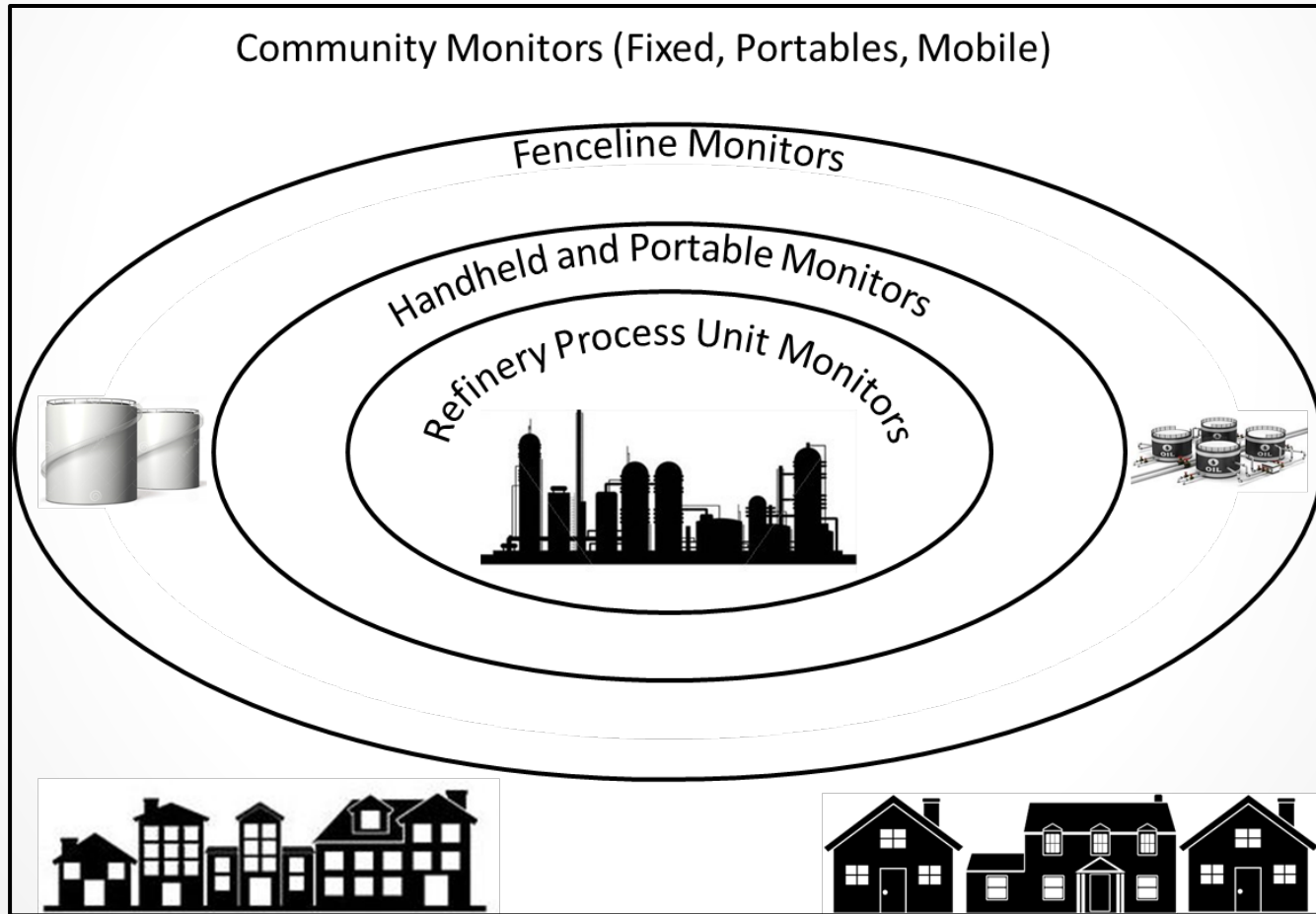
ARB Monitoring and Laboratory Division
Office of Emergency Response

California Air Pollution Control Officers
Association Air Monitoring Committee

California Environmental Protection Agency
 **Air Resources Board**

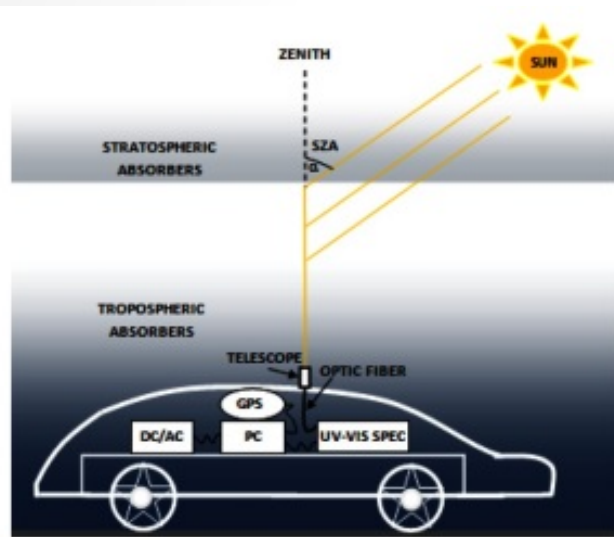


Monitoring Gaps and Best Practices



Technology Evaluations

Spectral Flux



SCAQMD AQ SPEC

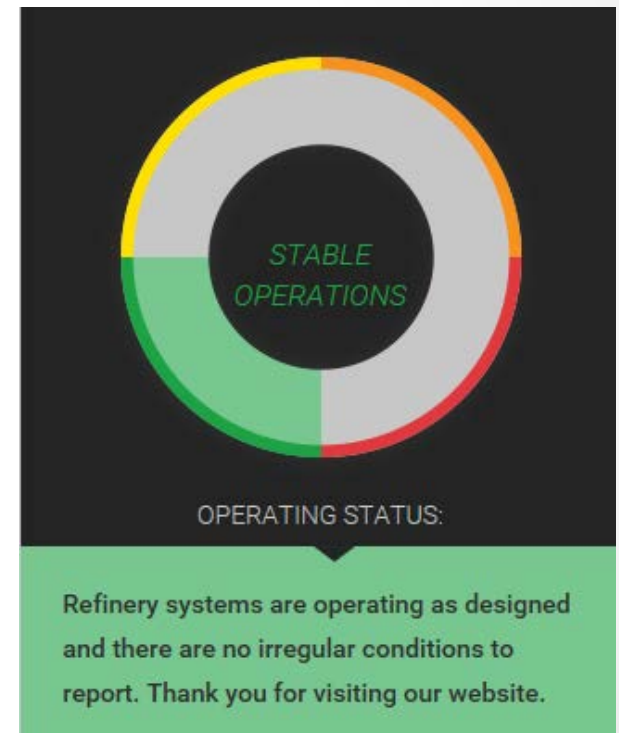


Coordination Gaps and Best Practices

Prevention and Preparedness



Communications



Layered Air Monitoring Strategy



Air Monitoring Stations



Personal and Handheld Monitors



Hazmat Vehicles and Mobile Labs



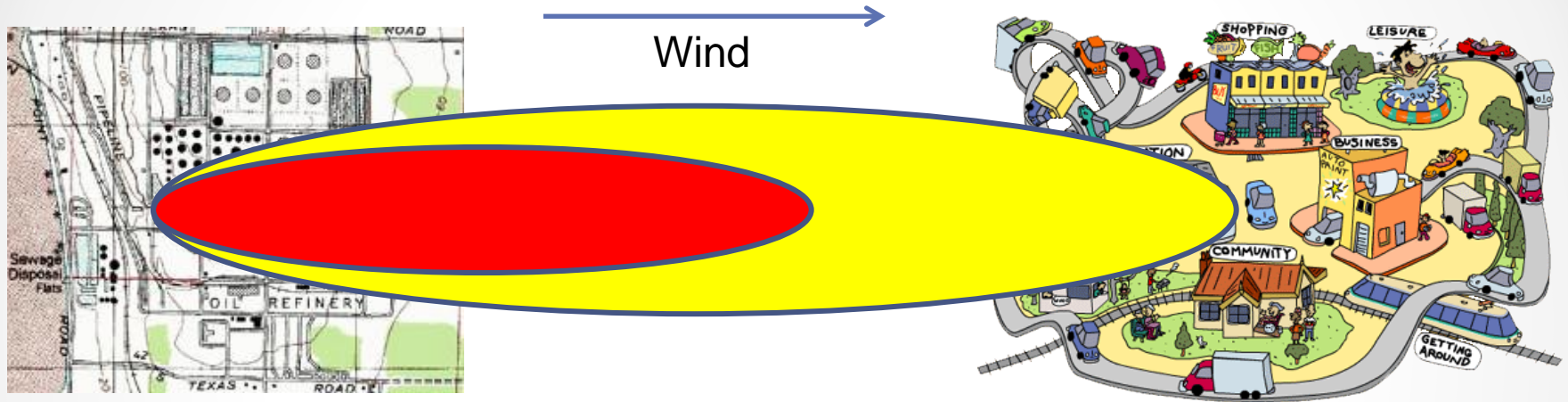
Community Monitors

Process Unit Monitors



Fenceline Monitors

Time, Distance, and Accuracy



Sensors at Source

- Timely Notification
- Higher Concentrations
- Tighter Spatial Resolution

Sensors in Community

- Modeling not required
- Measures actual impact
- More sensors needed

Industry Open Path Monitoring



Industry Community Monitoring



Nexus - Refinery Project to PQAOs

- Real-time monitoring
- Expanded network of monitors (air toxics, PM, community handheld and portable)
- Additional fixed monitoring potentially impacting AQS
 - Non-regulatory
 - More data for comparative research
 - More questions on appropriate siting & technologies

Routine Data Analysis

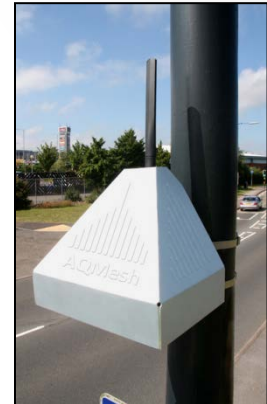
- Application of monitoring technology
 - Target compounds
 - Health effects
 - Siting considerations
 - Public access to data
 - Analysis of data
 - Cloud data storage



Future Monitoring Platforms

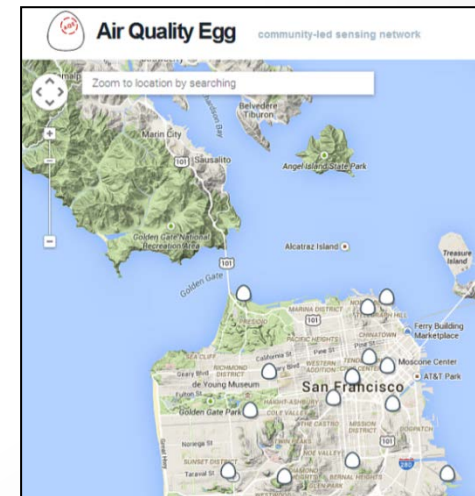
Advantages :

- Lower Cost
- Portable
- Real-time
- Widespread distribution
- Increased spatial resolution



Challenges :

- Accuracy/precision
- Calibration
- Interferences
- Interpretation
- Output of data
- Amount of data
- Use of data



Next Steps

- Issue report/public workshops
- Convene Refinery Monitoring Work Group
- Assist local agencies with securing resources
- Facilitate ongoing interagency collaboration

Online Clearinghouse

- Provides access to refinery related air monitoring information:

www.arb.ca.gov/fuels/carefinery/crseam/crseam.htm

- Or web search:

ARB Refinery

Further Information



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