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Engineering & Scientific Consulting





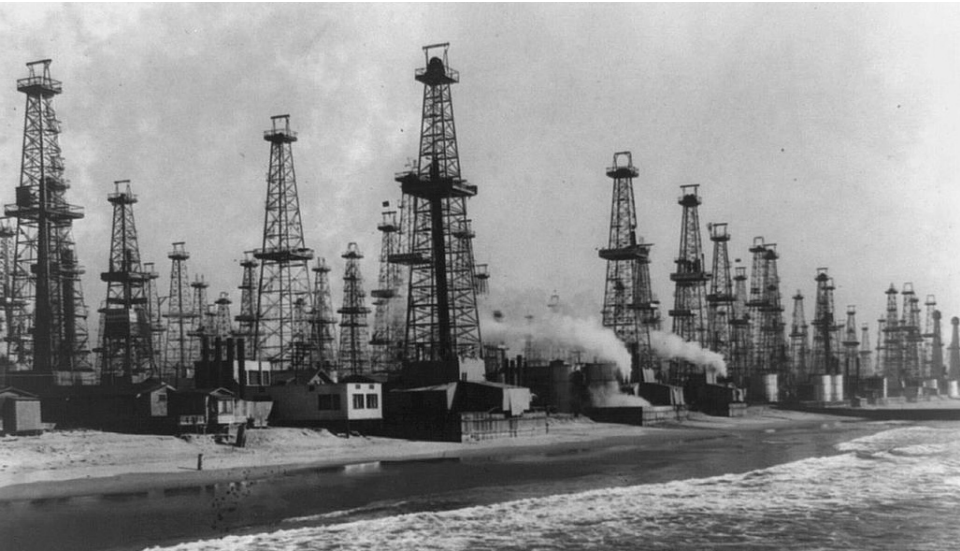
Addressing Public Outrage at An Oil Field Site in Down Town Los Angeles—An Air Monitoring and Risk Mitigation Model for Other Urban Oil and Gas Operations

Eric Winegar, PhD, Exponent

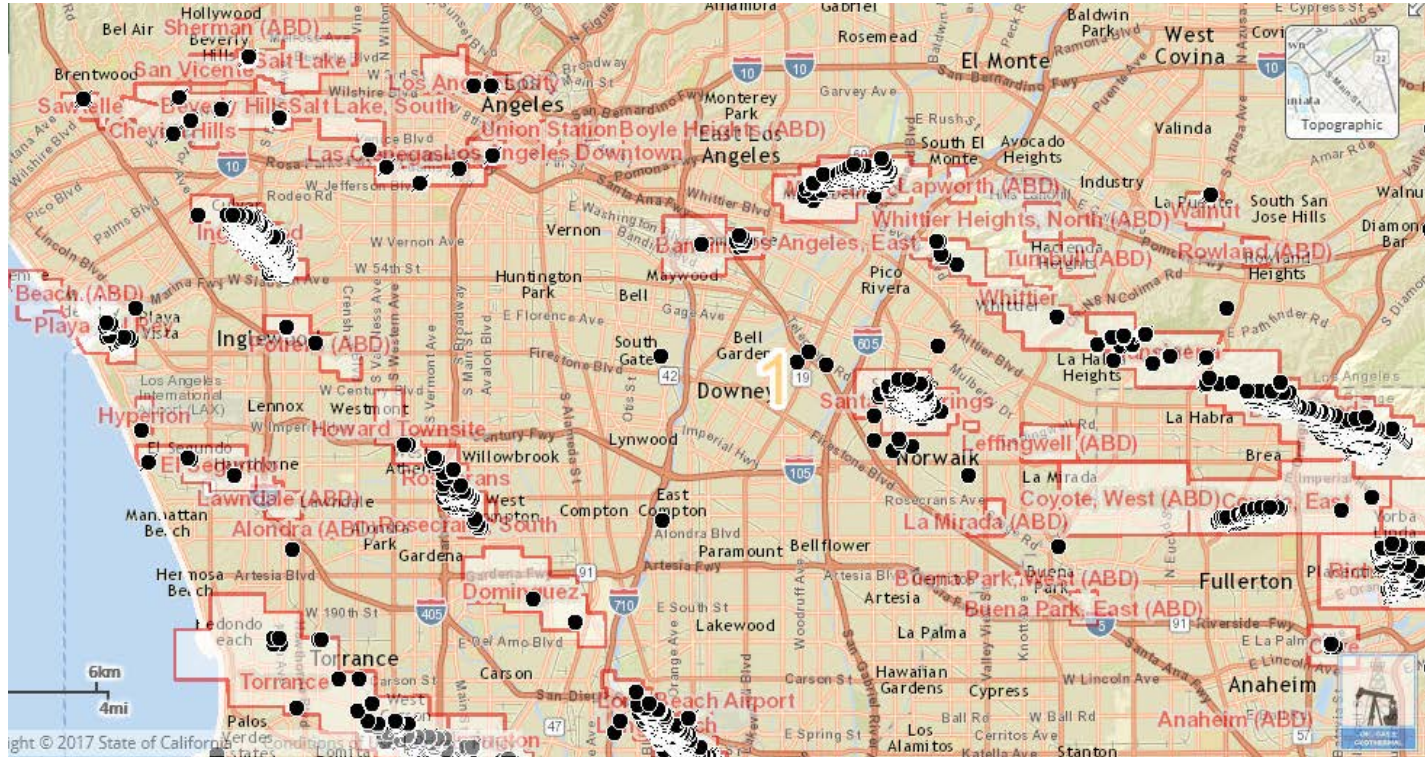
January 26, 2018

C. E. Lambert, PhD, DABT, Intrinsik

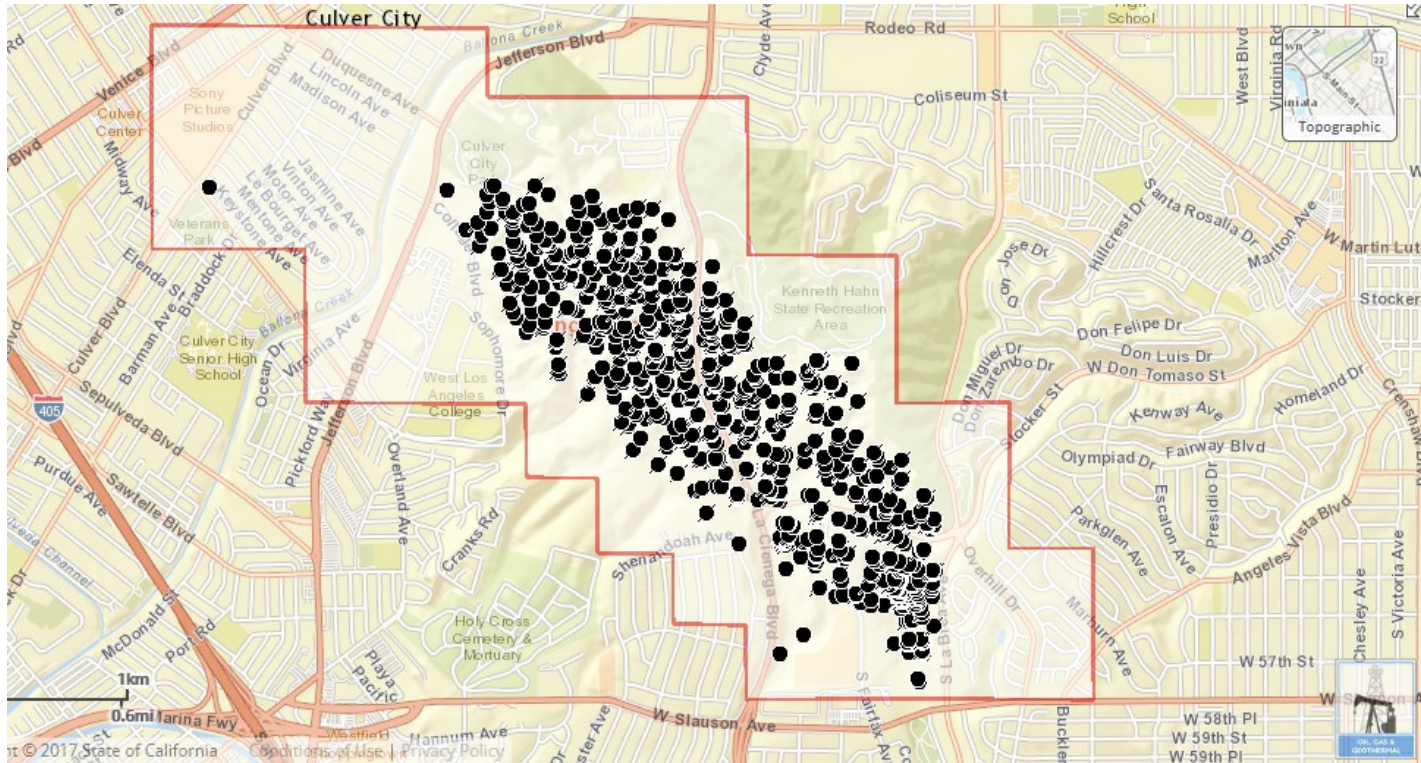
The Past: Before Hollywood, the Oil Industry Made LA



The Present: Los Angeles Oil Wells



High Density Urban Well Area



The Legacy of the LA Oil History



AllenCo Oil Field: A Locus of Conflict

- 1964: Initial well drilling
- 2009: Sold to AllenCo Energy
- 2010: Production increased
- 2010-2013: Complaints began
- 2010-2013: Agency visits/NOVs
- 2013: Closure
- 2018: Re-opening



Long-standing Origins of Oil Field Controversies



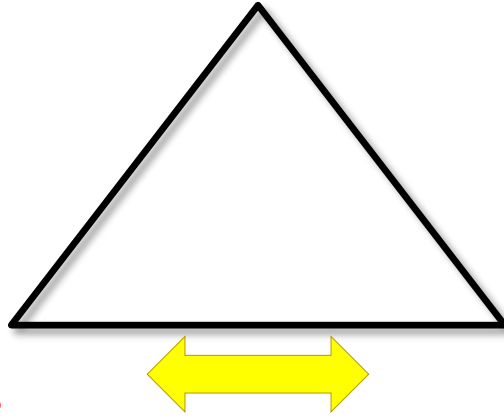
- Zoning laws favored O&G development vs. community protection
- With growth, City failed to address gaps in regulatory system
- Regulatory bodies did not enforce restrictions

→Over time, citizen activism increased←

Culmination of Forces Behind the Conflict

- 250 Complaints
- People not Pozos
- Class Action Lawsuit
- Porter Ranch

Land-use and Zoning Pressures



- AQMD NOV/ Settlement
- EPA Settlement
- City Lawsuit/ Settlement

Increased Community Activism and Awareness

Increased Regulatory Attention



Conflicts Lead to Closure...and Future Conditions

- Street demonstrations
- Negative publicity; threats
- Agency inspections—one which sickened EPA inspectors
- Appeals to the local Archdiocese and the Pope
- Senator Barbara Boxer
 - Called for AllenCo to shut down...which they did voluntarily—December, 2013
- Multiple agency violations

Consequences:

#1: Install Improvements in Systems

- City Attorney Lawsuit filed in 2014; in 2016 settled for \$1.25 million:
 - **Required monitoring system**
 - Required adherence to all agency specifications

Question:

Can this (and similar) operation exist alongside the community?

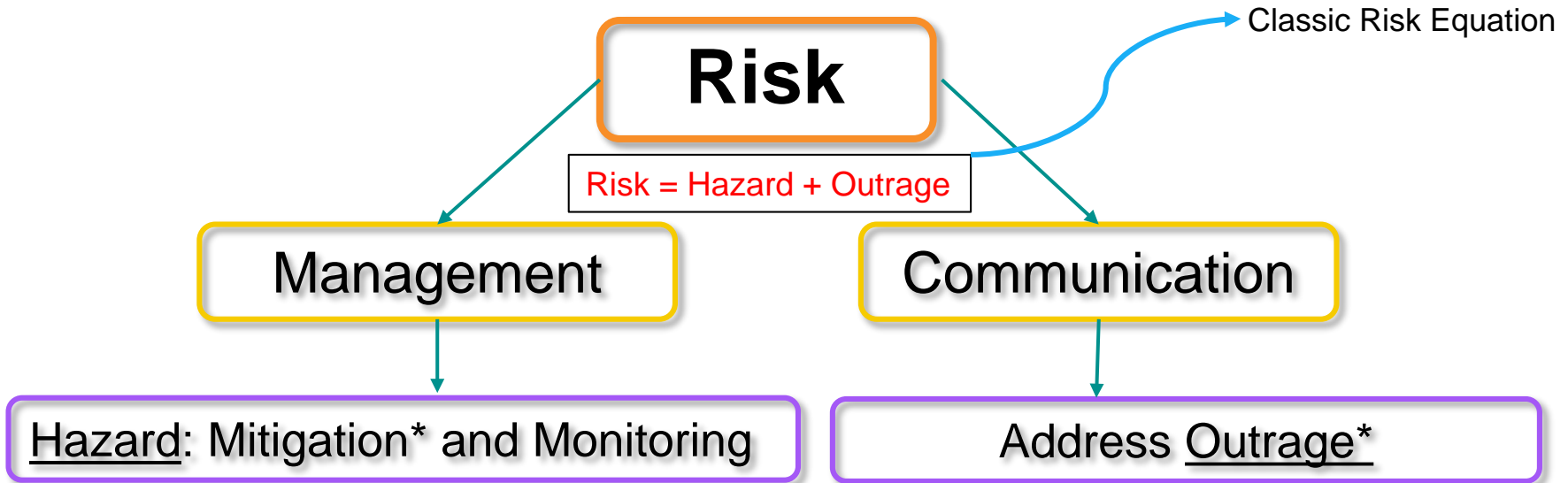


*If done right

Fine print: There will always be opposition.



How? It's All About Risk



*Mitigation = Operational Improvements

*Outrage = The Past...and The Future

Managing the Hazard

- Mitigation—Operational Improvements

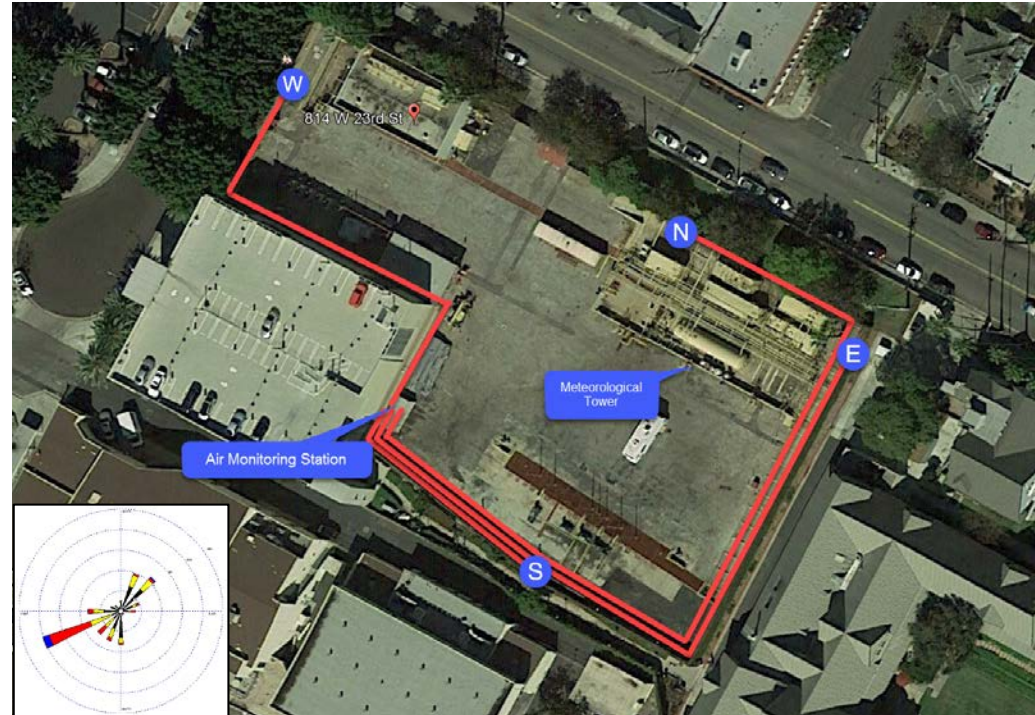
- New tanks
- New plumbing
- New methane sensors
- New fire system
- New tank monitoring systems
- Removed sump

- Monitoring System

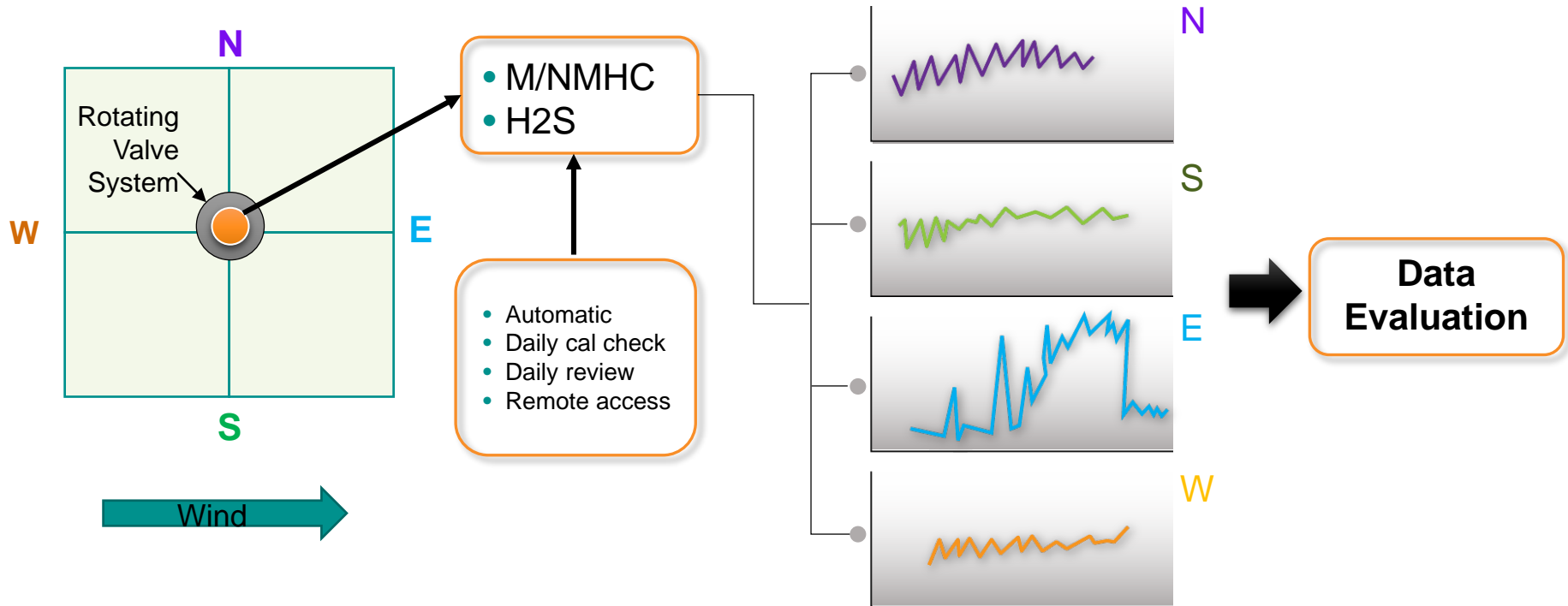
- State of the Art System
- Addresses community concern
 - Odors
 - Exposure—acute and chronic
 - Use health-based standards
 - US EPA
 - California OEHHA
 - Scientific literature

Fence Line Sampling System

- Continuous, real-time
- All four sides of facility
- Targets:
 - Methane: Non-Toxic--Part of oil extraction
 - Non-methane hydrocarbons (NMHC): Surrogate for thousands of individual species
 - Hydrogen sulfide: Part of oil extraction
- Meteorology: Wind is transport mechanism
- Special Targets: Toxics species

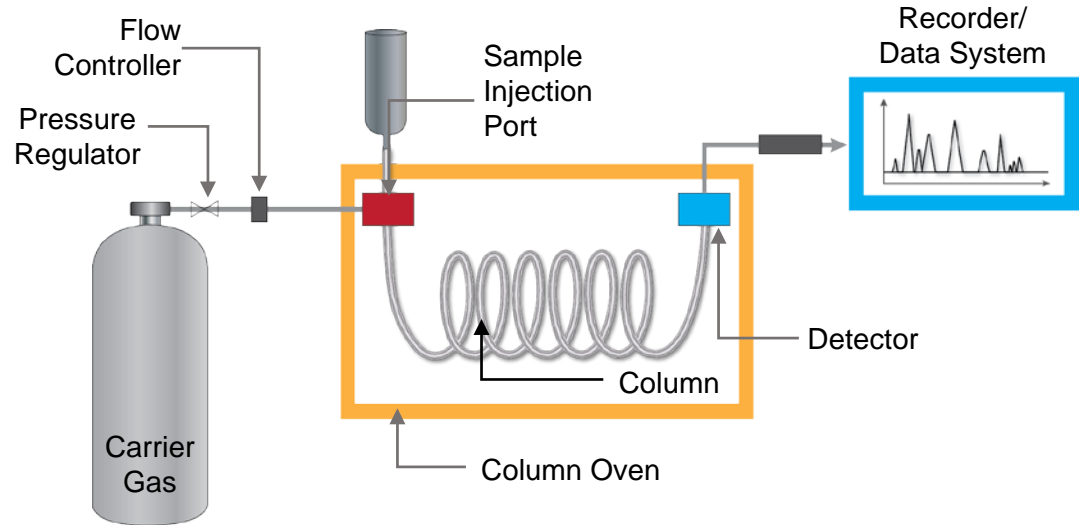


Rotating Inlet Sampling System



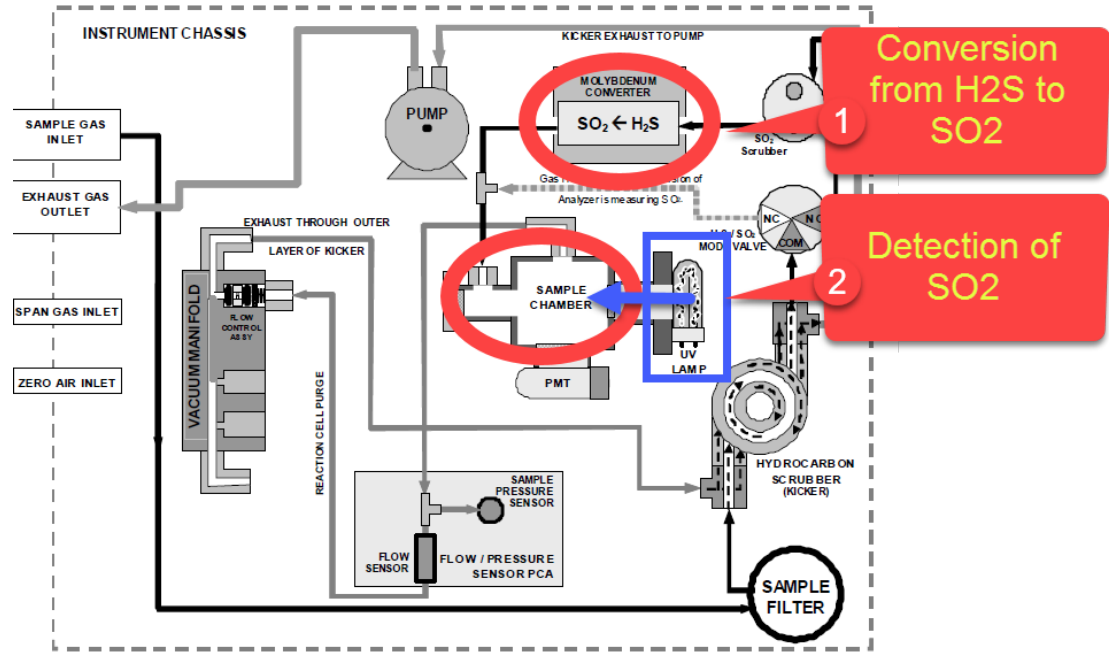
Methane/Non-methane Hydrocarbons

- GC/FID with backflush
- Methane, then
- Backflush for Total HC
- Three minute cycle
- 50 ppbv detection limit
- 1% precision
- Daily calibration checks



Hydrogen Sulfide

- Thermal UV-fluorescence photometry
- Continuous analysis—1 minute average
- 1 ppbv sensitivity
- Agency-type instrument



Measurement Process

Collection



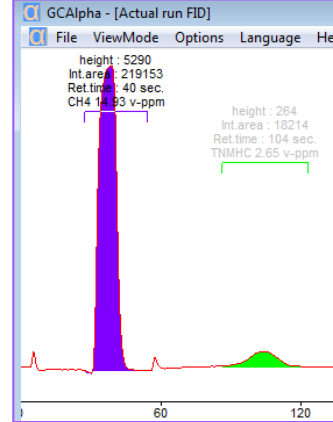
Transport



Analysis



Data



Evaluation

- Tier 1:
- Tier 2:
- Tier 3:

Data Evaluation: Tier Levels → Leading to Actions

Definition: Tier (action) levels* defined as a set of actions to be performed upon exceedance

- **Tier 1:** **Minor** events—Minor events in facility → NO community effect
- **Tier 2:** **Potential** for community impact (odors and/or exposure*)
- **Tier 3:** **Significant** impact*—**Facility shut down**; notification of public agencies and community

*Determined by health standards

What is in a Tier?

- **Targets**—Chemicals to be monitored
- **Averaging time**—Length of measurement period
- **Frequency**—Consequences for frequency exceedances
- **Actions**—Actions to be taken upon exceedance

Tier Exceedance: What happens?

- **Detection:** Independent (not AllenCo employee) System Operator validates that trigger level has been exceeded
- **Notification:**
 - Tier 1) AllenCo operator
 - Tier 2) Public via website
 - Tier 3) Public agencies and community
- **Cause:** Determine cause and remediate
- **Verification:** Confirm that the cause of the exceedance has been corrected or repaired

Addressing Outrage:

Truth (Data) and Consequences (Actions)

- Improvements and Monitoring System
 - Inherently address concerns
 - Monitoring system results are two-fold:
 - Protective of community → outward facing
 - Forces operations to improve → inward facing
- Actions vs. Simple Data Reporting
 - Data is of no value unless paired with potential action...and consequences

General Meta-message: How to Manage the Community-Industry Interface

Is there a way for a facility and the community to coexist?

- **Yes** (in my opinion):
 - Mitigation* + monitoring** → Inherently Address Outrage

*Mitigation = Fix operations

**Monitoring = Enforce standards to Protect; Surveil Operations

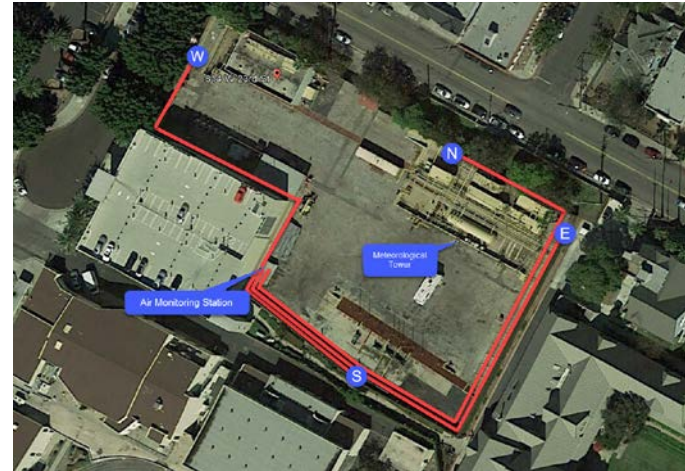
A Solution-?: Regional Compliance vs. Community Monitoring

**South Coast
AQMD Monitoring Stations—
38 General Stations for 16.8 Million people**



Last Updated: May 19, 2016

**AllenCo
Community Monitoring—
Source-specific for Local Neighborhood**





Thank you

In God we trust; all others must bring data.

W. Edwards Deming