



Community-Scale Air Toxics Monitoring – Sun Valley Neighborhood and General Aviation Airports

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October 2 - 4, 2007**

Project Overview

- **U.S. EPA Community-Scale Air Toxics Grant: Three Components**
 - 1. Monitoring in communities around general aviation airports**
 - 2. Neighborhood scale monitoring in Sun Valley, CA – industrial area interspersed with residences**
 - 3. Review of hexavalent chrome data and sources**



General Aviation Airports Study Objectives

- **Characterize air toxics levels in the communities around GA airports**
- **Compare data to other air toxics studies such as SCAQMD's Multiple Air Toxics Exposure Study (MATES-III)**
- **Determine potential impact of airport emissions on measured pollutant levels**
- **Provide baseline data for future studies**



Advisory Committee of Stakeholders

- **Membership**

- **Airport Management**
- **Community Groups**
- **Cities of Los Angeles and Santa Monica (Airport Authorities)**
- **Aviation Industry**
- **State and Federal Congressional Representatives**

- **Role**

- **Provide Initial Input on Specific Issues**
- **Comment on Sampling Locations**
- **Coordinate Information Outreach**

Measurements

- TSP Lead and Hexavalent Chromium
- PM10 Mass and Carbon
- PM2.5 Mass & Components
- Continuous Particle Count (ultrafine)
- Volatile Organic Compounds (3 x 8 hour periods)
- Carbonyls (acetaldehyde, etc.)
- Continuous Carbon Monoxide



Van Nuys Airport

- Largest Number of General Aviation Operations in the Country

VOR Site #2



Van Nuys Airport Sampling Sites



● Complete Sampling Array (Site 1, 2, 3, 4)

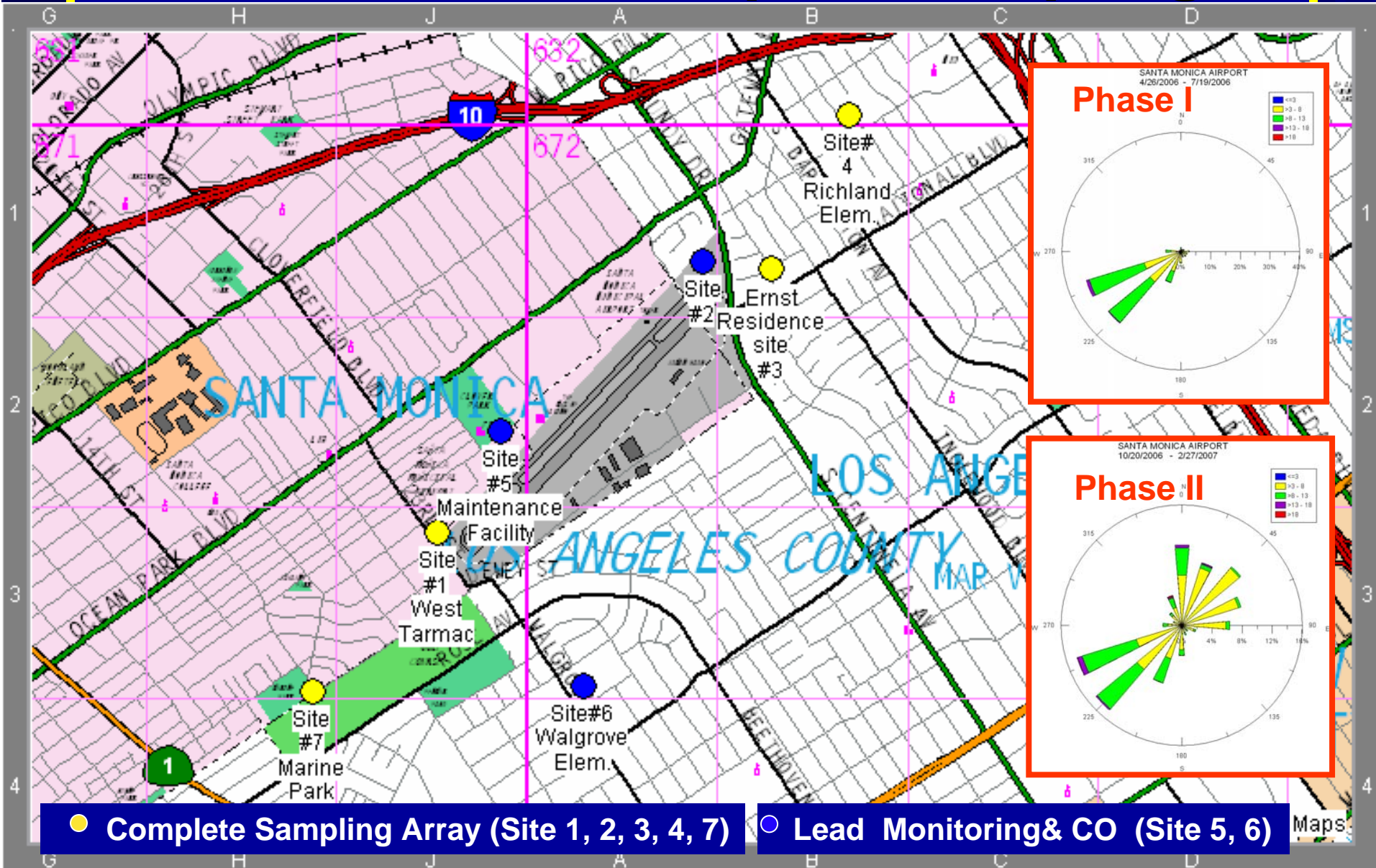
○ Lead & CO Monitoring (Site 5, 6, 7)

Santa Monica Airport

- Runways adjacent to neighborhoods
- Increased Number of Private Jet Traffic



Santa Monica Airport Sampling



Santa Monica Airport Sampling Sites



Sampling Schedule

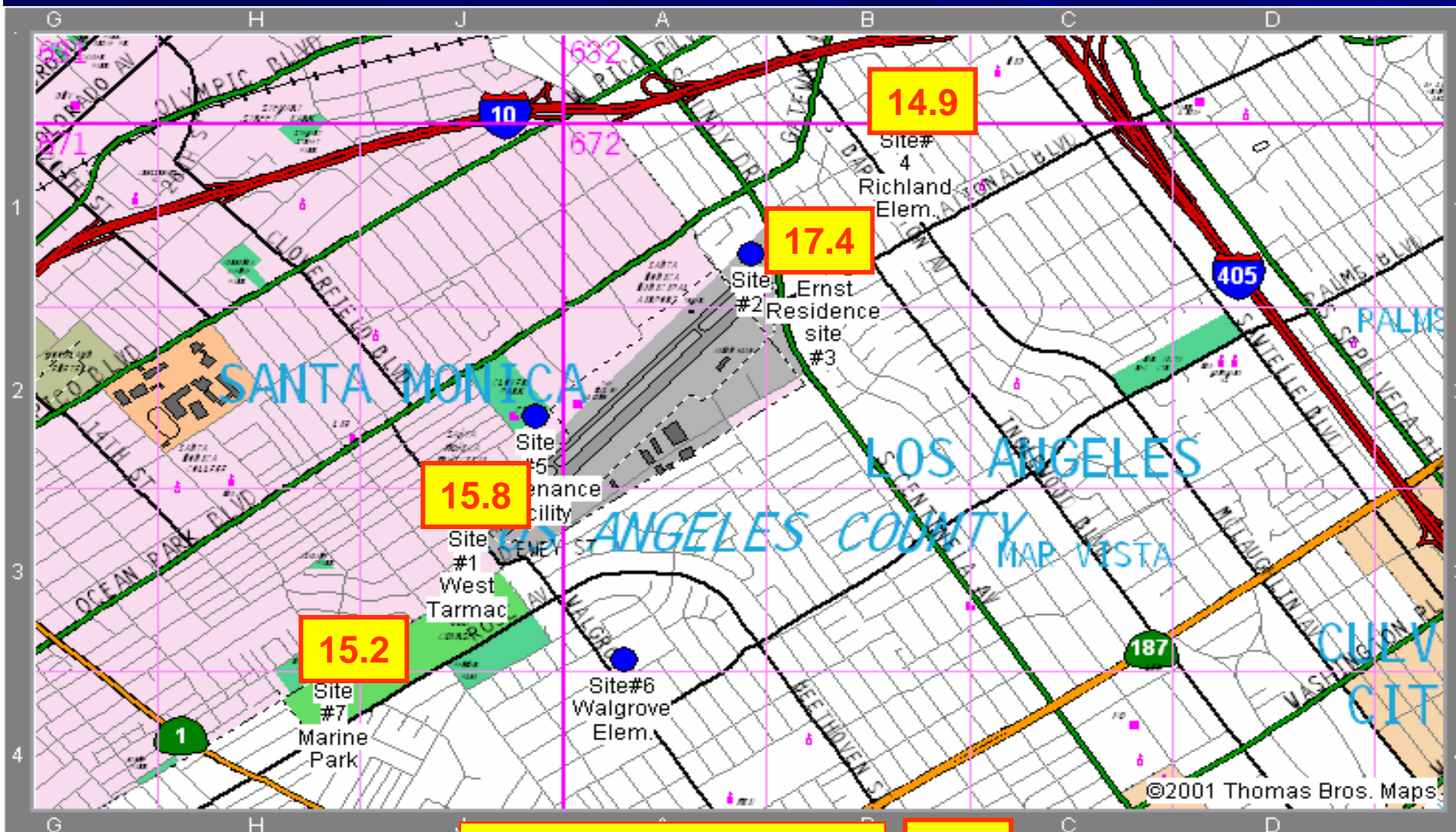
- Approximately 12 months of sampling beginning November 2005
- Three months at each airport in two different seasons
- Sampling Completed March 2007



Key Questions

- **Can lead found in GA fuel be measured in surrounding communities?**
- **What are PM and air toxic levels in neighborhoods near GA airports?**
- **What are the ultrafine particle count concentrations in the surrounding communities?**
- **Are aircraft emissions distinguishable from other emissions sources?**

Santa Monica Airport PM2.5 Mass ($\mu\text{g}/\text{m}^3$) Phase I - Apr 06 - Jul 06

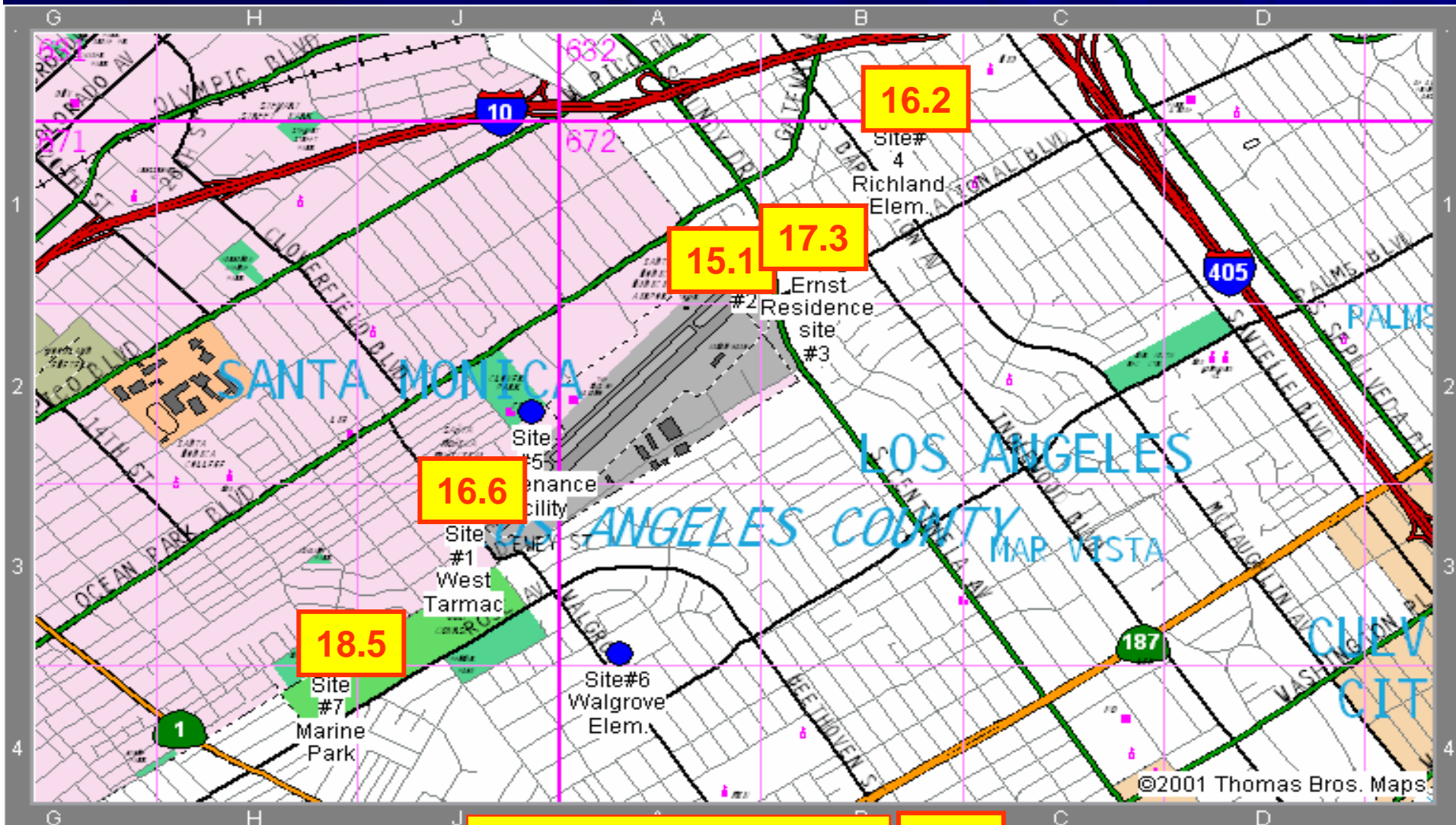


Annual Basin Average

18.1

Santa Monica Airport PM2.5 Mass ($\mu\text{g}/\text{m}^3$)

Phase II - Oct 06 - Feb 07



Annual Basin Average

18.1

Santa Monica Airport PM2.5 Elemental Carbon ($\mu\text{g}/\text{m}^3$)

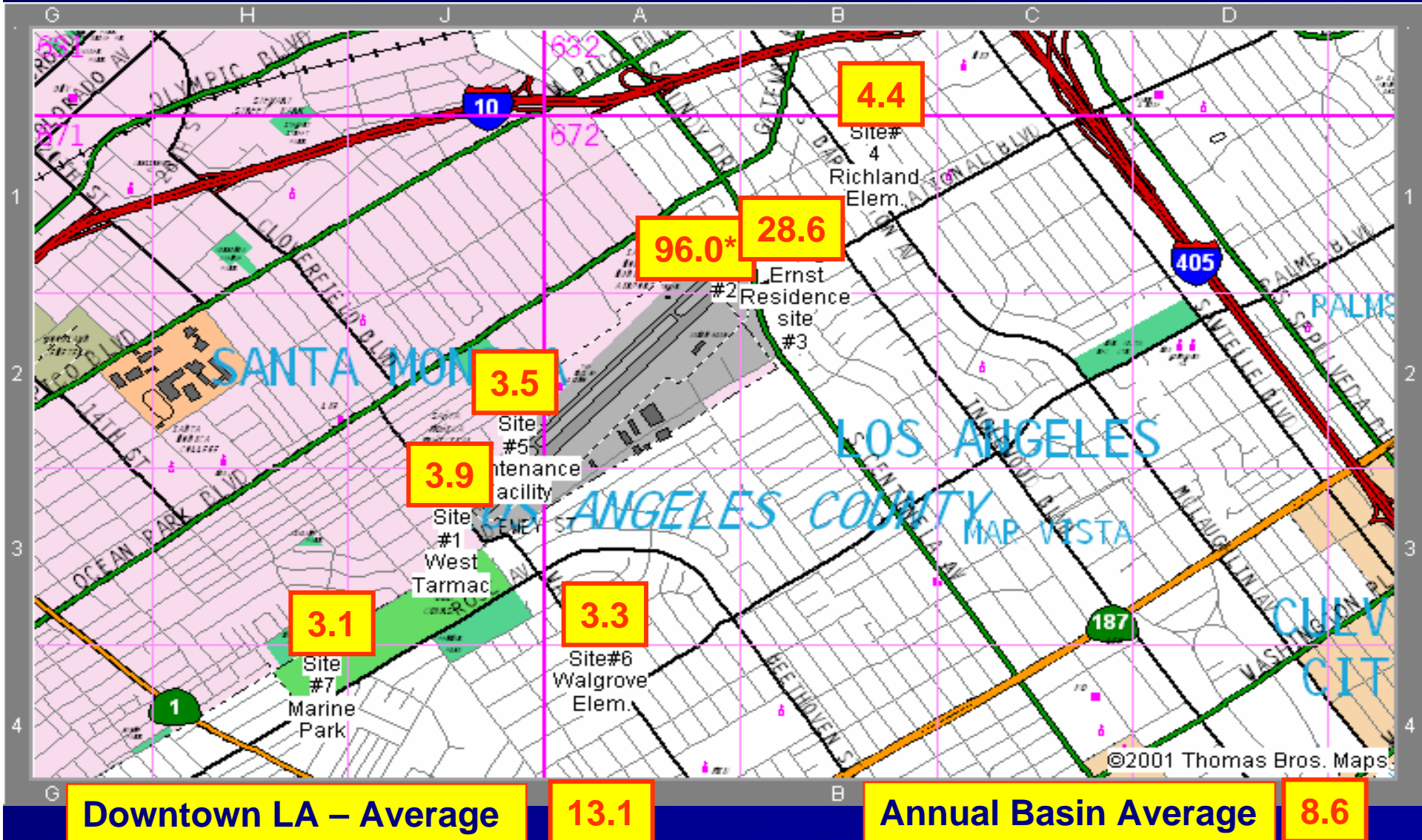
Phase II - Oct 06 - Feb 07



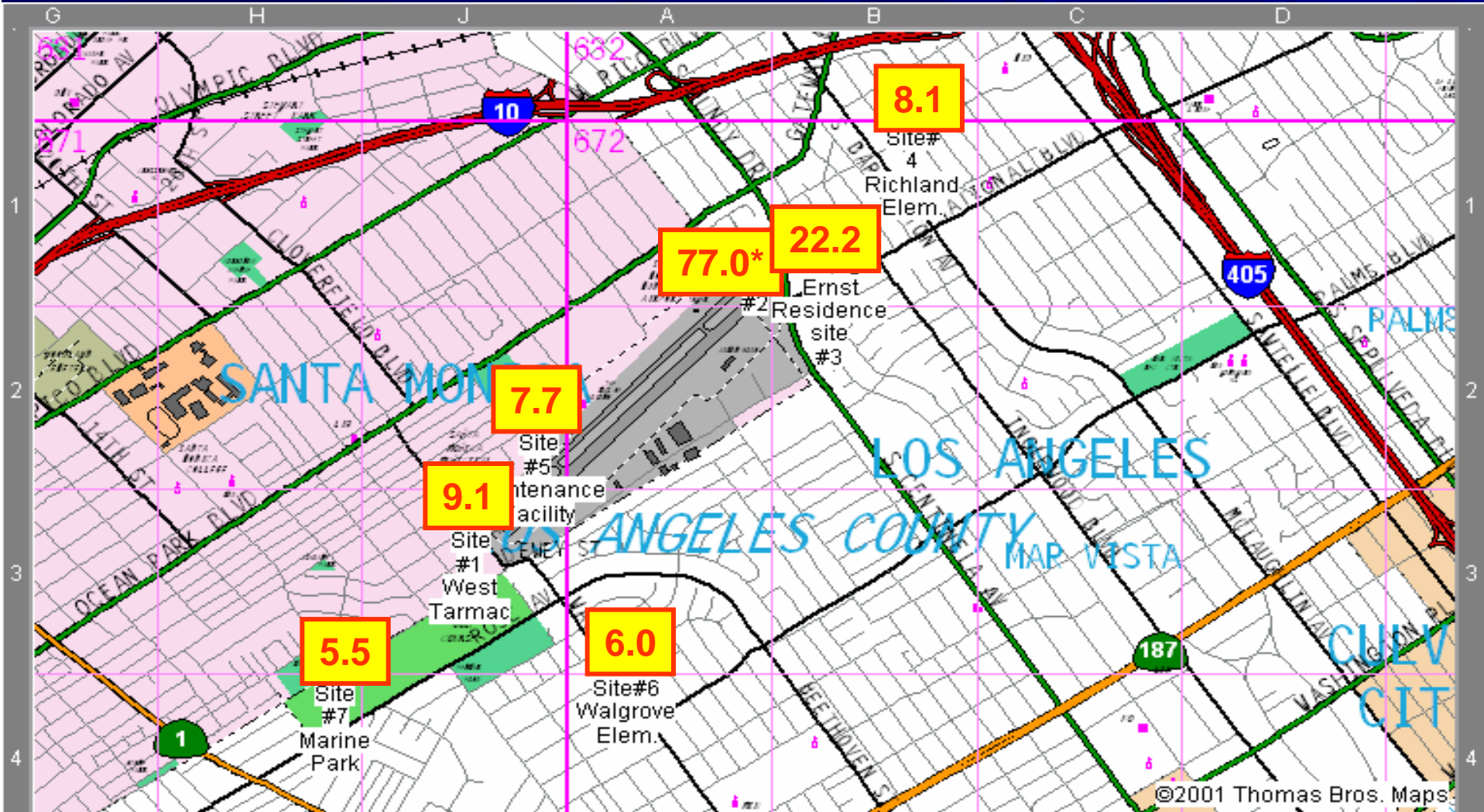
Annual Basin Average

2.2

Santa Monica Airport TSP Lead (ng/m³) Phase I - Apr 06 - Jun 06



Santa Monica Airport TSP Lead (ng/m³) Phase II - Nov 06 - Feb 07



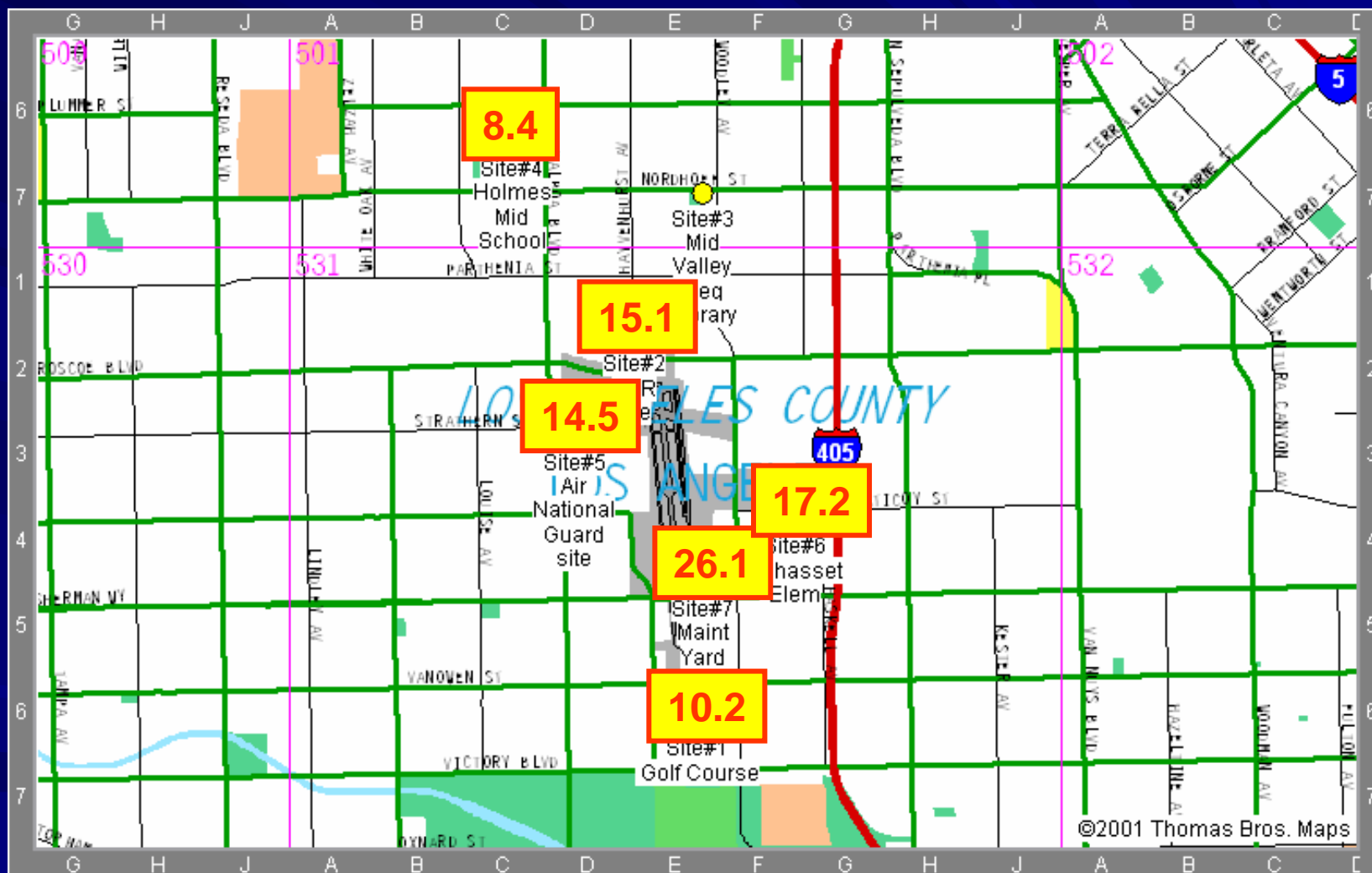
Downtown LA - Average

13.1

Annual Basin Average

8.6

Van Nuys Airport TSP Lead (ng/m³) Phase I – Nov 05 - Feb 06



Annual Basin Average

8.6

Santa Monica Airport Benzene (ppb) Phase I - Apr 06 - Jul 06

0:00-8:00, 8:00-16:00, 16:00-24:00

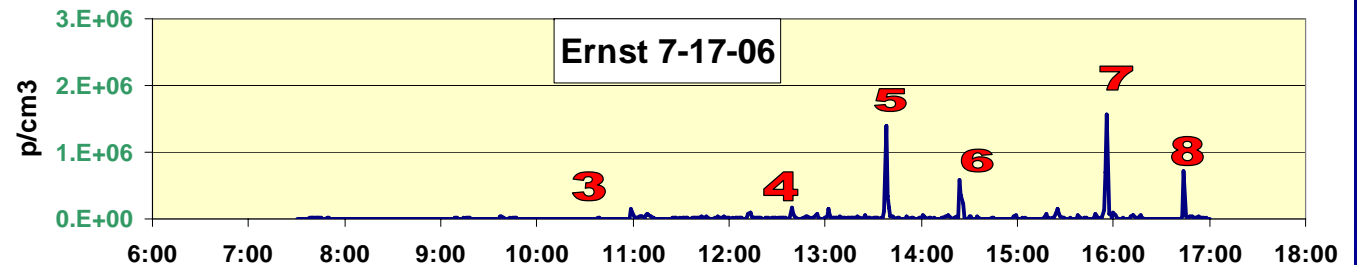
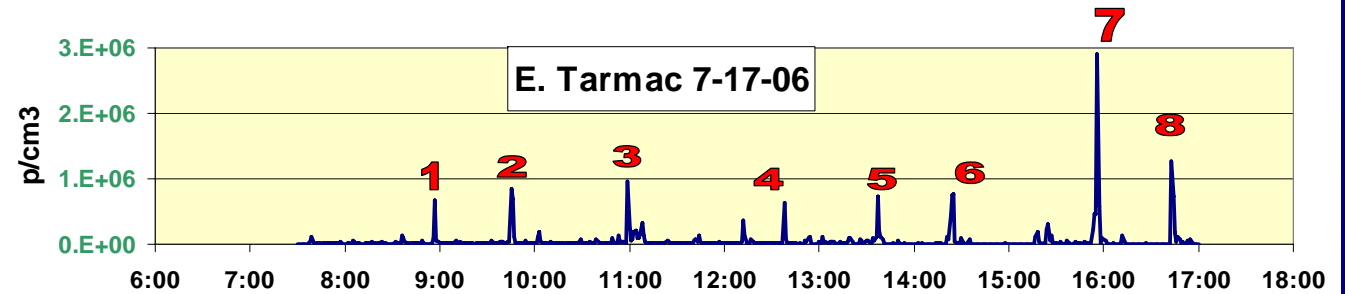


Annual Basin Average 0.42

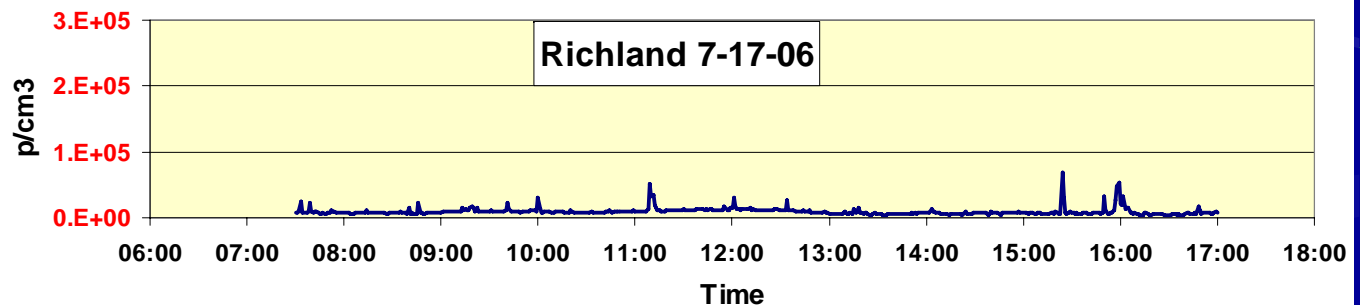
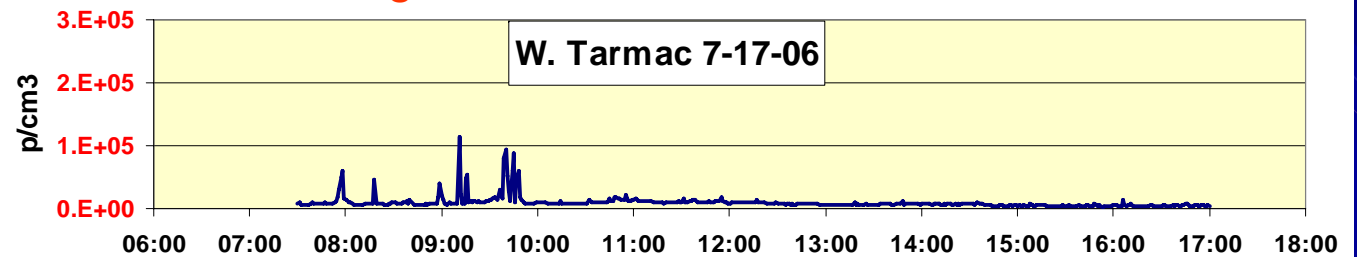
Santa Monica Continuous Number Concentrations

July 17, 2006

Red numbers
correspond to
aircraft take-offs



Note Scale Change



GA Airport Results

- **Lead levels in communities and near runways below federal and state standards, but elevated at near runway sites**
- **Airport influence on PM_{2.5} concentrations may not be distinguishable, but appears to be minor**
- **Ultrafine particles (measured by number concentration) significantly elevated near runways during aircraft operations**

Potential Future Air Toxics Monitoring at Airports

- **More continuous instrumentation**
- **Mobile sampling platforms**
- **Coordinate with health studies**
- **Large commercial airports**

Sun Valley Air Quality Background

- **Previous Projects**
 - Landfills
 - Chrome Plating
 - Schools
- **Current Project**
 - Community Concerns
 - Concurrent with MATES III



MATES III

- **Multiple Air Toxics Exposure Study III**
 - Level of Toxics in the Basin
 - 2 Year Study
 - 10 Fixed Sites
 - Microscale Sites Include Fernangeles School – Sun Valley

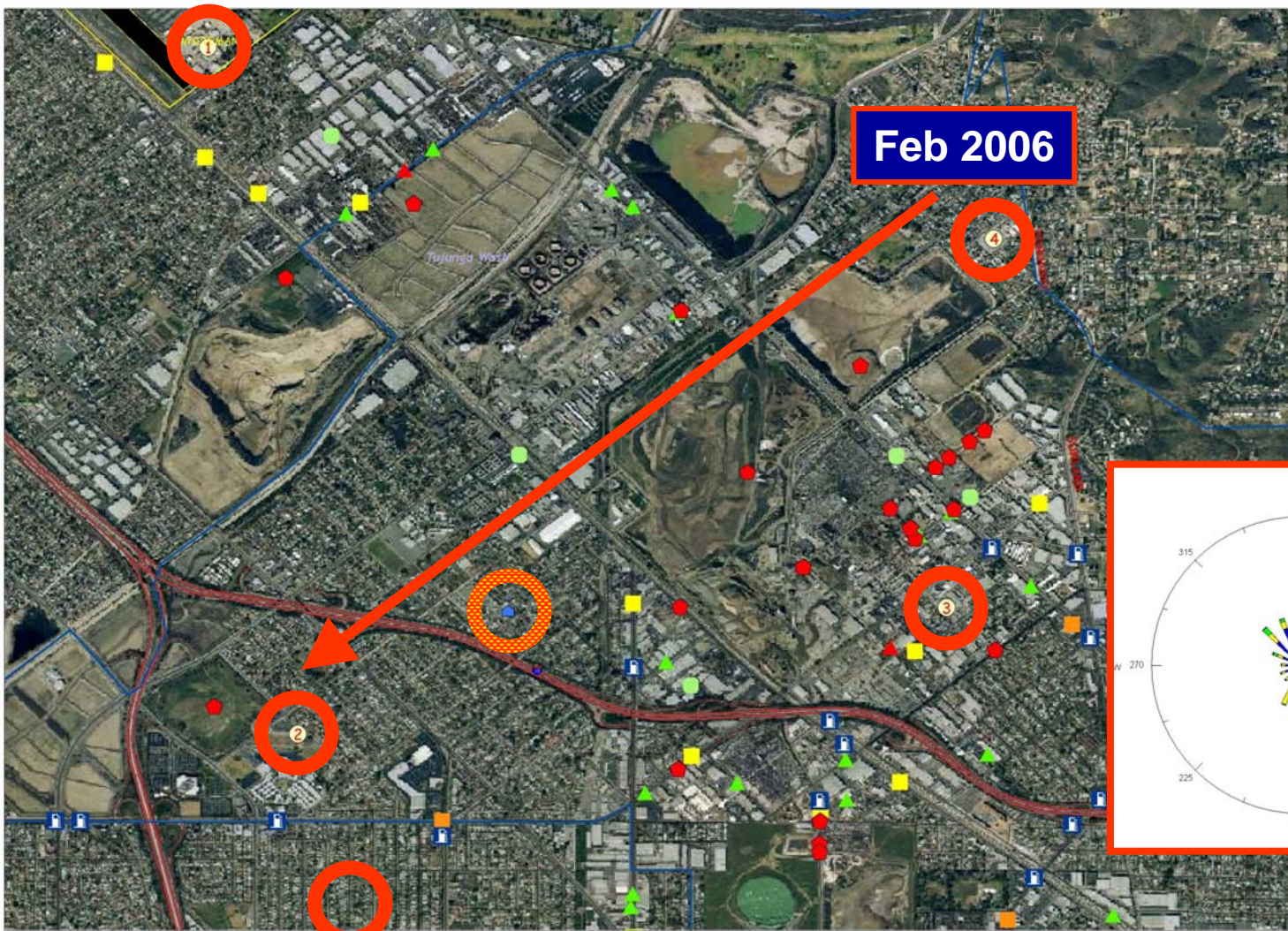


Measurements

- **Lead, Hexavalent Chromium, and Air Toxic Metals**
- **Air Toxic Gases**
- **PM10 Mass and Carbon**
- **Wind Speed and Direction**
- **One year duration**
 - 24 hours samples
 - Every 3rd day
- **Locations**
 - Based on Community Concerns



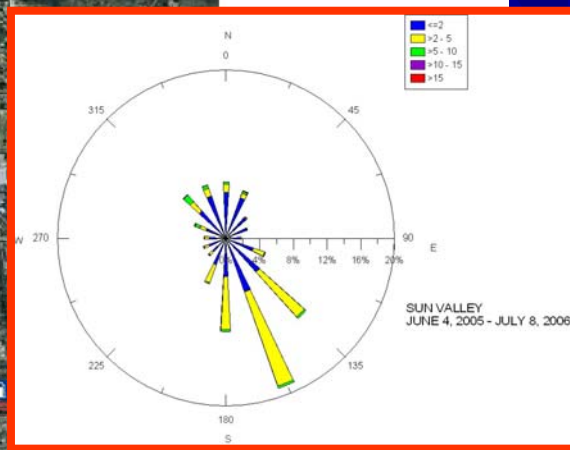
Sampling Locations



Feb 2006

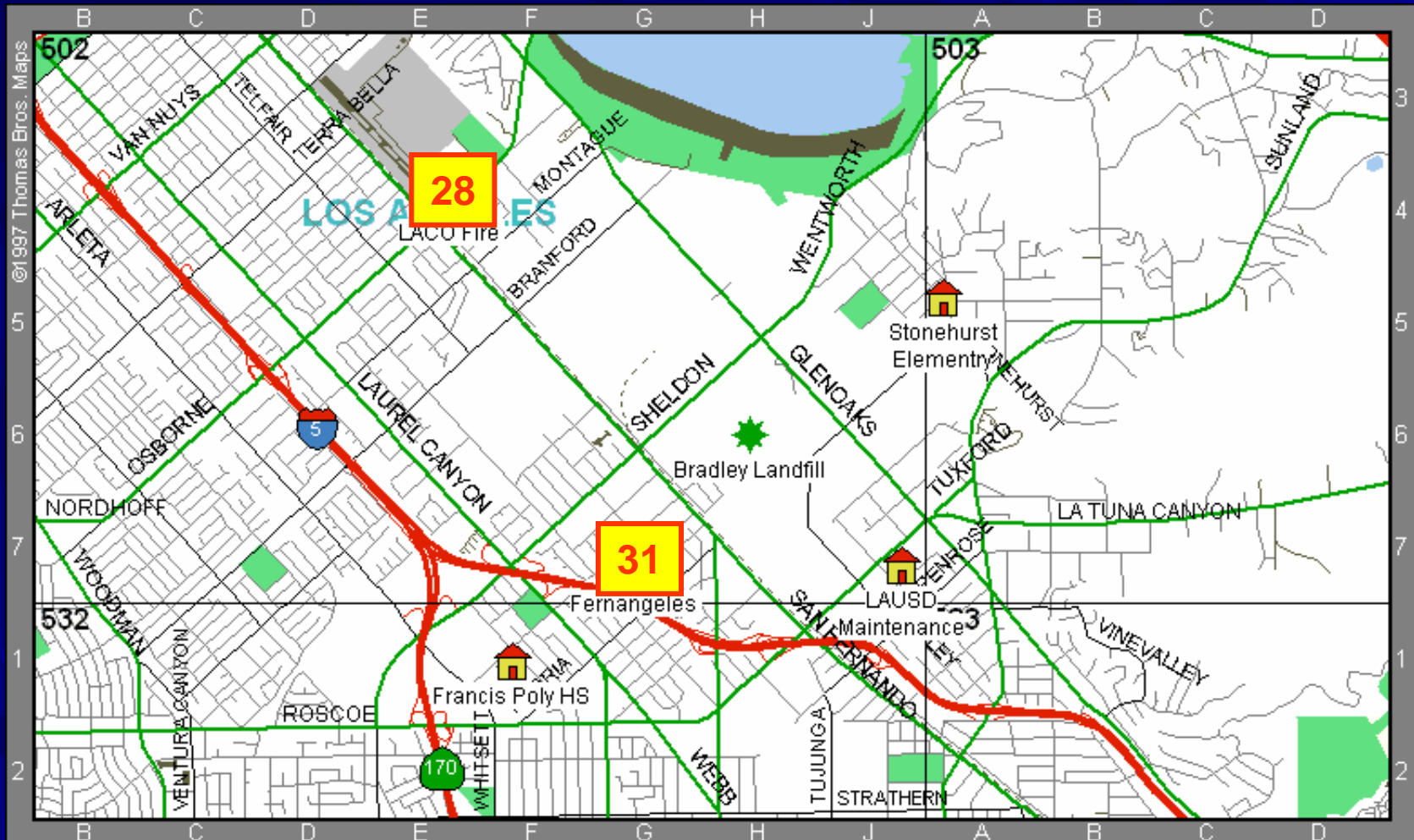
Burbank

- Legend**
- ◆ Recycling/Landfill Facilities
 - Autobody Shops
 - Dry Cleaners
 - ▲ Fiberglass Mfg.
 - ▲ Metal Plating & Finishing
 - Printing & Publishing
 - Ⓛ Gas Station
 - Ⓛ Fernageles School
 - Monitoring Sites
- | Number | Site Name |
|--------|-------------------------------|
| 1 | Fire Station |
| 2 | Robert W Lewis Athletic Field |
| 3 | LAUSD Maintenance Yard |
| 4 | Stonehurst Elementary School |



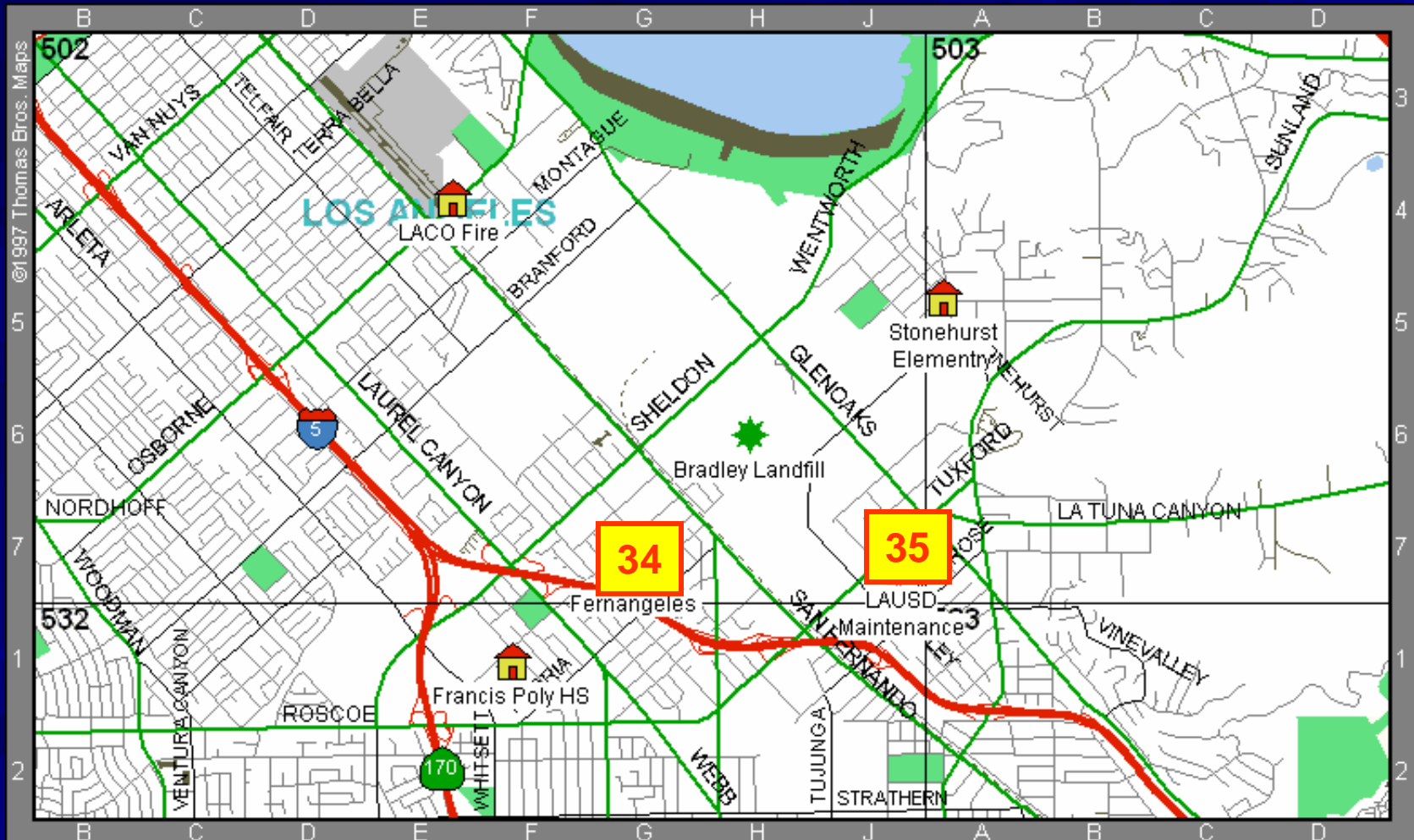
SunValleySource3.mxd March 4, 2008

PM10 Mass ($\mu\text{g}/\text{m}^3$) 10/28/05 – 6/25/06



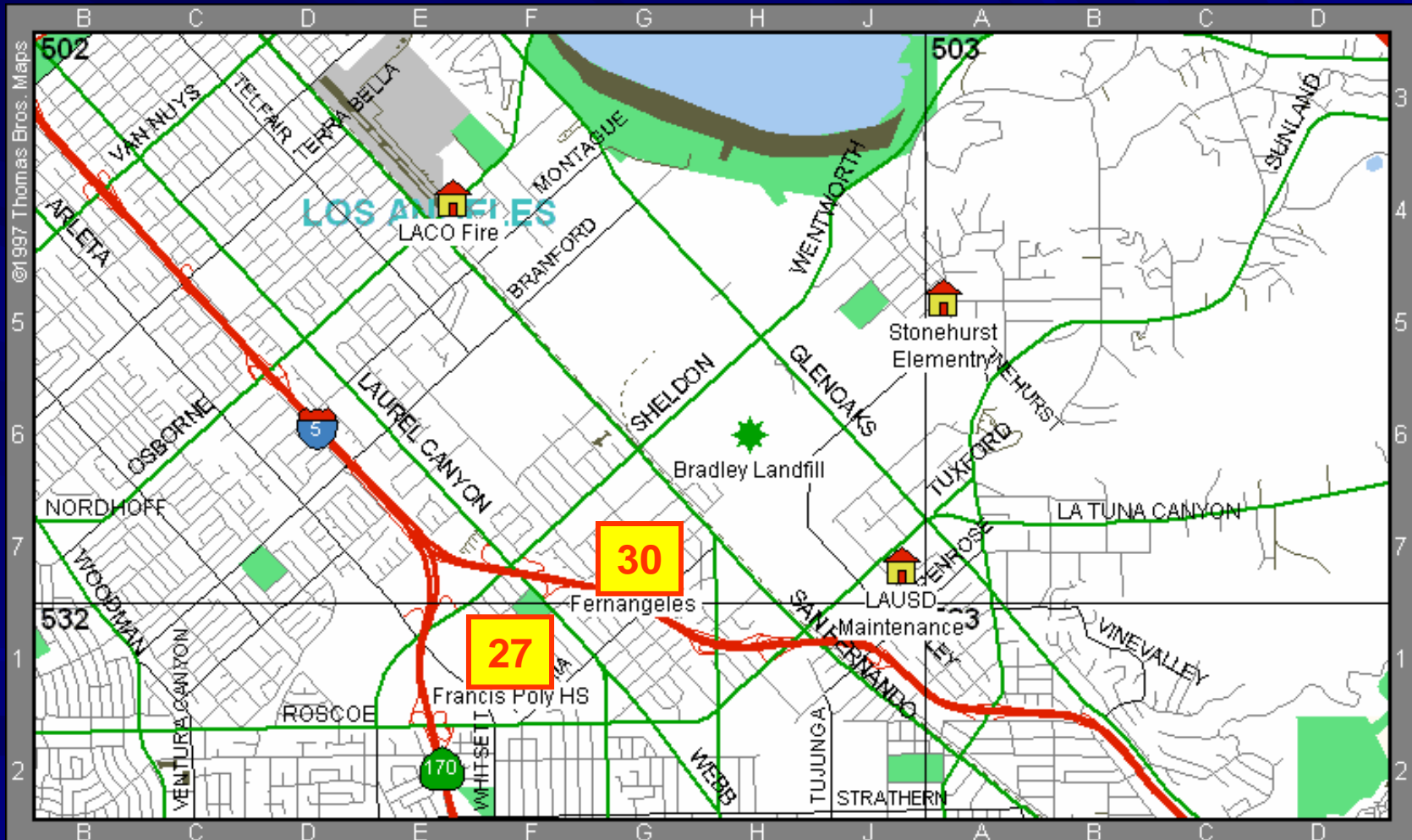
Burbank **34**

PM10 Mass ($\mu\text{g}/\text{m}^3$) 8/23/05 – 6/25/06



Burbank **35**

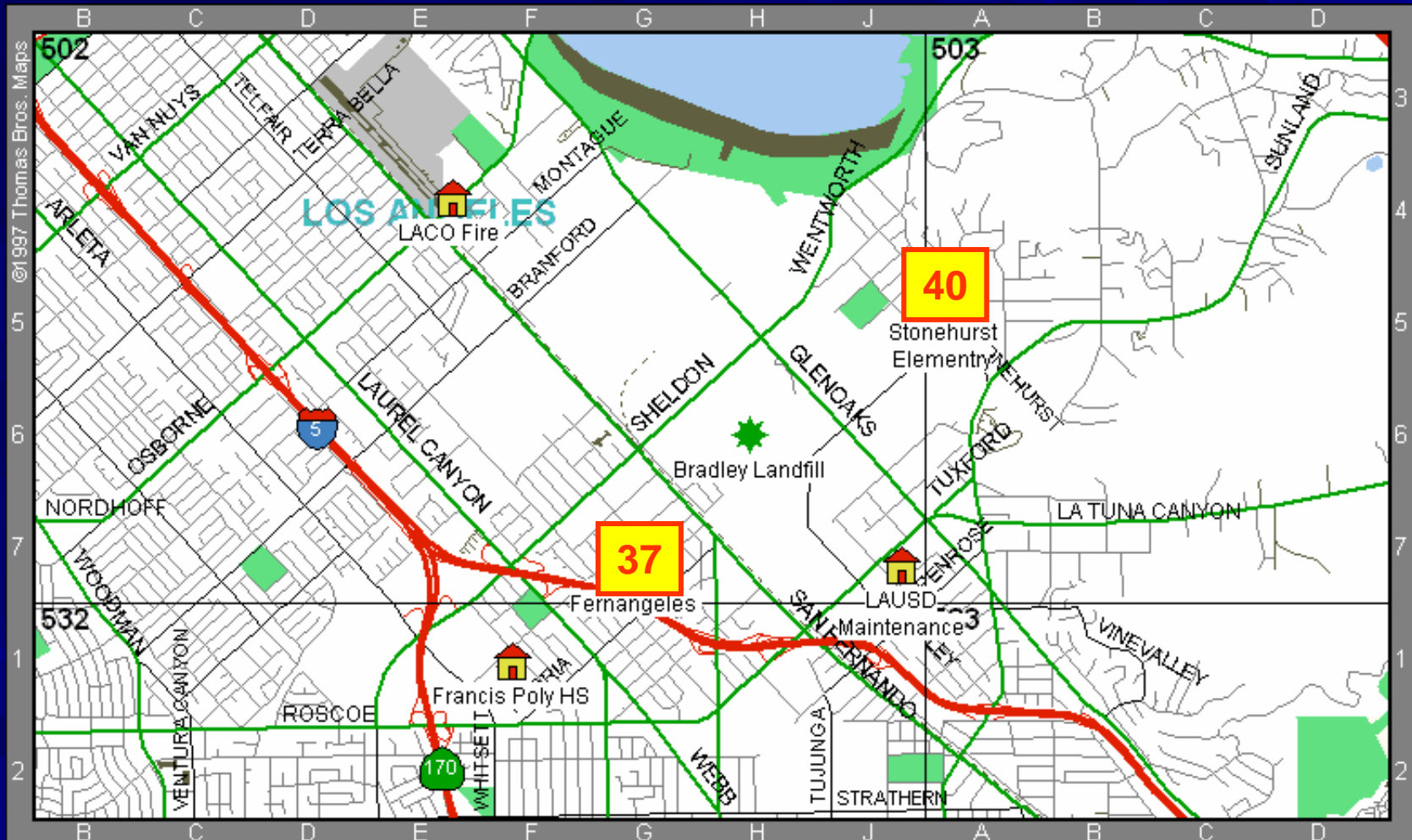
PM10 Mass ($\mu\text{g}/\text{m}^3$) 2/13/06 – 6/25/06



Burbank 31

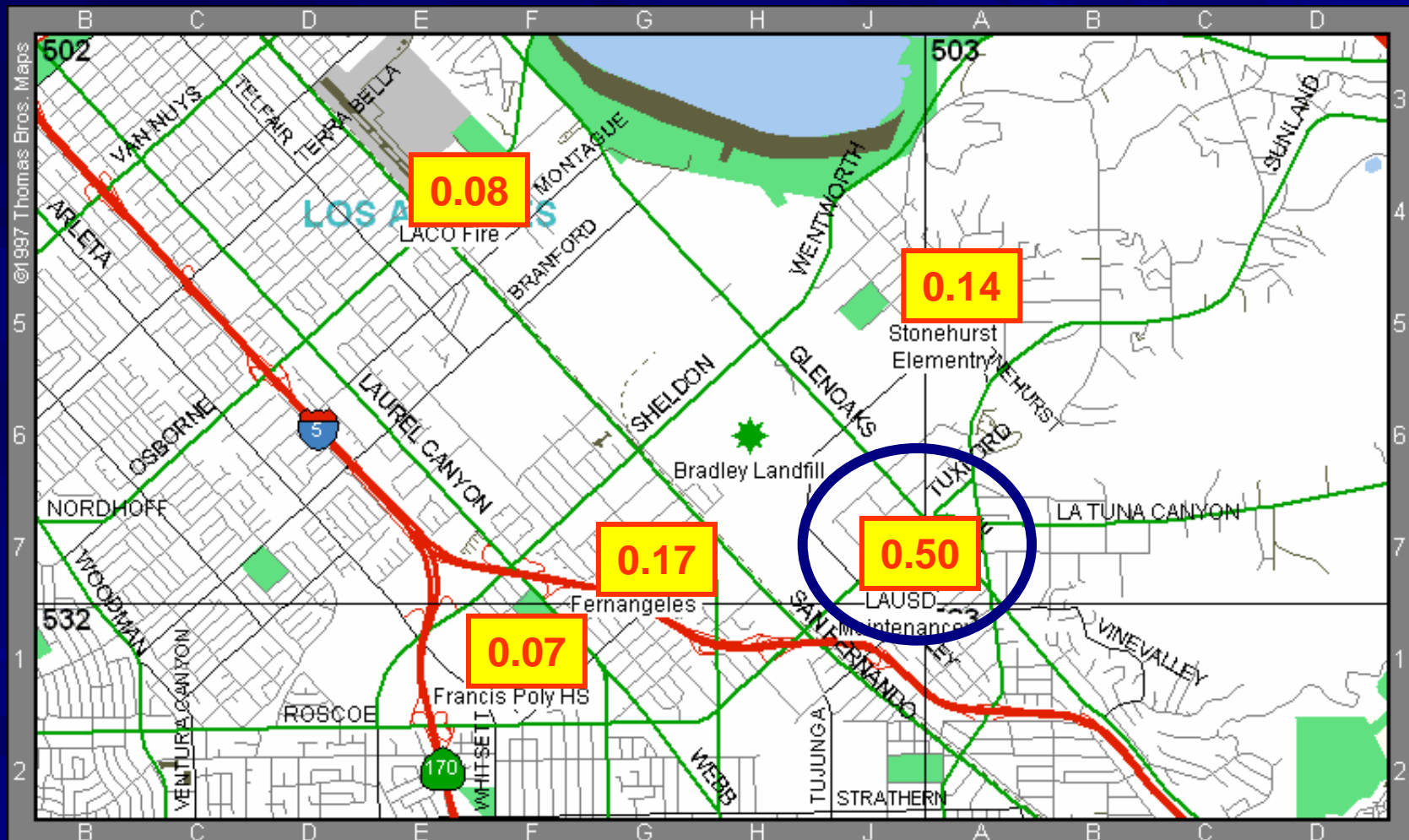
PM10 Mass ($\mu\text{g}/\text{m}^3$)

8/23/05 – 2/7/06



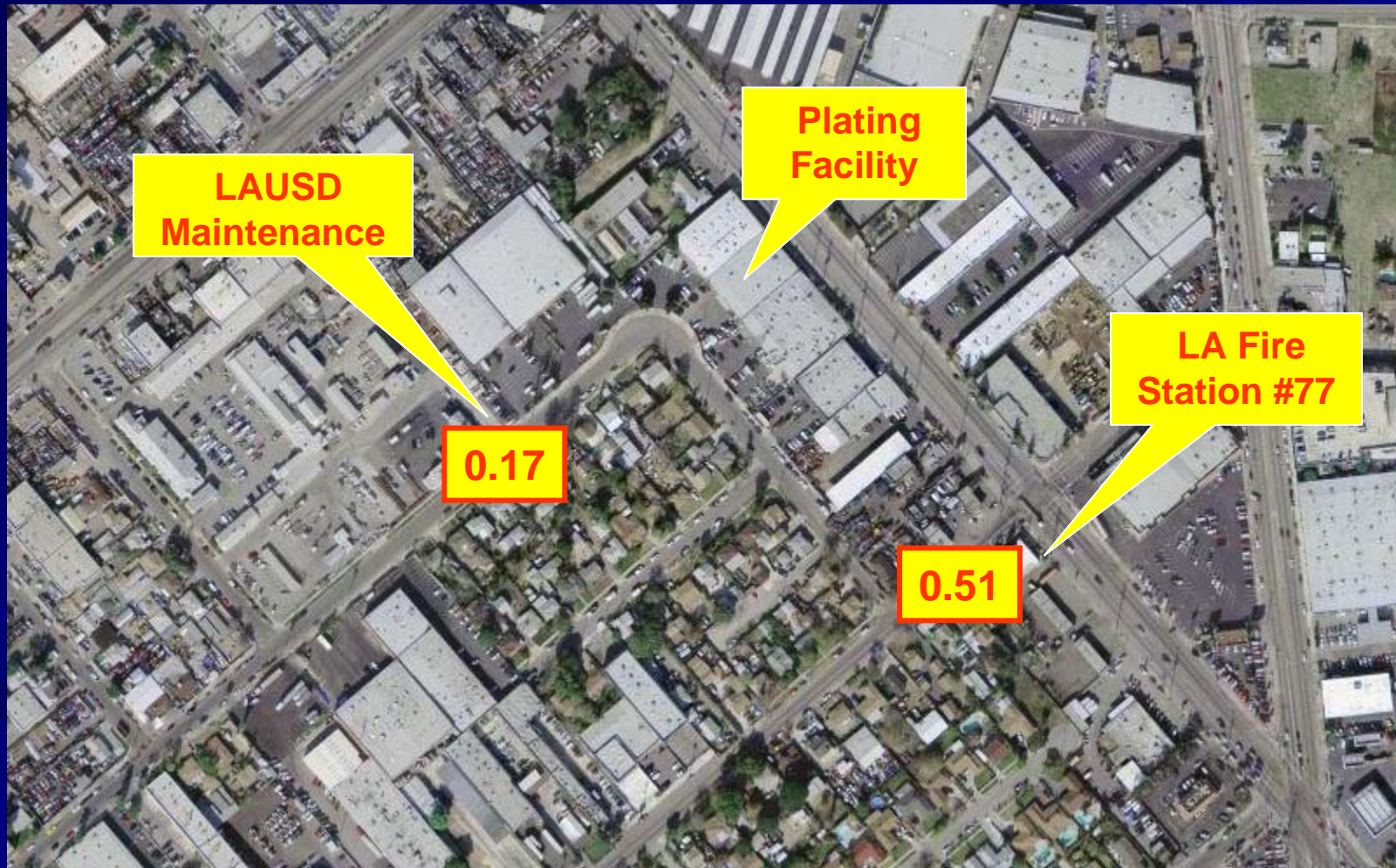
Burbank **37**

Hexavalent Chromium (ng/m³) Averages over Various Time Periods



Burbank 0.13

Hexavalent Chromium (ng/m³) June, July 2006



Review of Hexavalent Chrome Sources and Ambient Data

- Ambient levels from MATES sites do not show enough consistent variability to identify “hot spots”
- Monitoring near fence-line at known sources (metal plating) continues at several locations on a 1-in-6 day basis
- Concentrations of 1 ng/m³ Cr6⁺ or higher considered significant
- Vast majority of samples show less than 1 ng/m³
- A few samples per year at active facilities contain higher than 1 and 4 ng/m³
- High measured levels followed up with enhanced source testing and inspection activities

Example: Chrome Plating Facility

