

San Joaquin Valley 2008 PM2.5 Plan Technical Discussion



California Environmental Protection Agency

Planning and Technical Support Division

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Fresno

CRPAQS Provides Scientific Basis

- Extensive field monitoring at the surface and aloft



- hundreds of monitoring sites
- millions of data records
- numerous teams of experts



- Improved emission inventory
- State-of-the-science air quality modeling
- World class data base

CRPAQS Findings

Nature of PM2.5 Problem

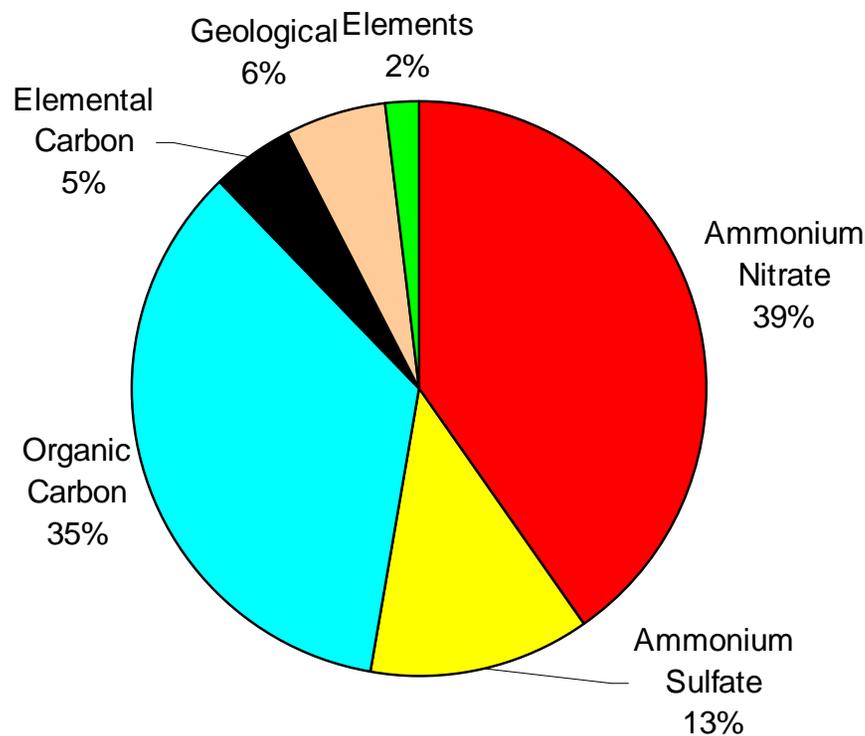
- PM2.5 highest in winter
- Ammonium nitrate and organic carbon are major components:
 - Ammonium nitrate throughout Valley
 - Organic carbon highest in urban areas

Key Pollutants to Control

- NOx most effective in reducing ammonium nitrate
- PM2.5 from combustion sources most effective in reducing organic carbon

PM2.5 Air Quality

**2004-2006 Average Composition
Bakersfield**



2004 - 2006 Design Values

- Stockton
12.9 ug/m³
- Fresno
17.2 ug/m³
- Bakersfield
18.9 ug/m³

Emission Inventory

- Comprehensive review of all emission categories. Incorporated updates to:
 - Agricultural Burning
 - Residential Wood Combustion
 - Cooking
 - Manufacturing and Industrial Fuel Combustion
 - Fugitive dust
- Prepare spatially and temporally distributed emission inventories for air quality modeling

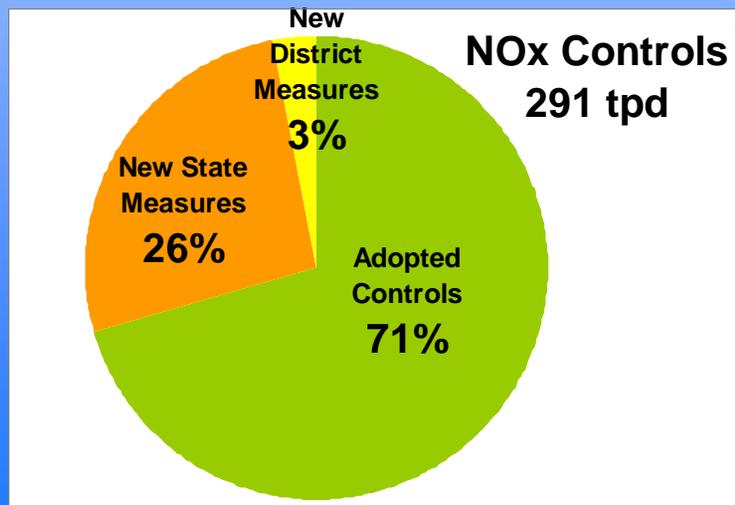
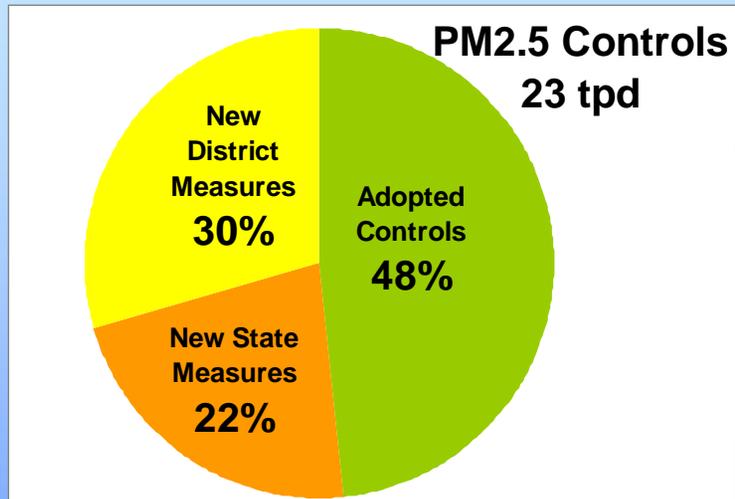
Attainment Demonstration

- Attainment demonstration characterizes the emission reductions needed for attainment
- U.S. EPA requires weight-of-evidence approach for attainment demonstration
- Multiple tools used:
 - Air quality and emissions trends
 - Source apportionment and other modeling (rollback)
 - Grid-based photochemical modeling

Air Quality Modeling

- Models Used:
 - **Air Quality – CMAQ** (U.S. EPA Community Multi-Scale Air Quality Model)
 - **Meteorology – MM5** (Pennsylvania State University / National Center for Atmospheric Research Mesoscale Model)
- Periods Modeled:
 - One full year of daily modeling
 - 2000 used to establish model performance (CRPAQS)
 - 2005 and 2014 used to evaluate attainment (with 2000 meteorology)
- CMAQ and MM5 models are widely used and thoroughly peer-reviewed
- Conducted according to U.S. EPA guidelines
- Run on multiple computer clusters

Control Strategy



- Already adopted controls provide most NO_x and PM_{2.5} reductions
- Full attainment reached with:
 - ARB 2007 State Strategy
 - New District controls