

Workshop on the Draft 2006 PM10 Plan

October 21, 2005

Planning Division



Workshop Agenda

- Welcome and introductions
- Background
- Emissions inventory
- Air quality
- Modeling
- Control strategy and RFP
- Comments and questions

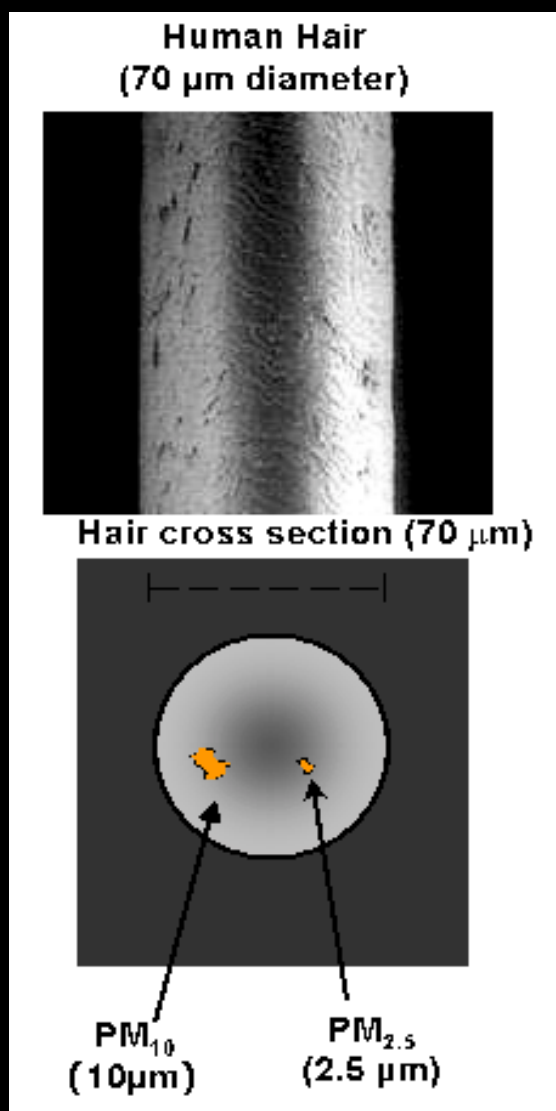


Purpose of Workshop

- Provide an overview of the *2006 PM10 Plan*
- Describe the technical details of the *2006 PM10 Plan*, including air quality, emissions inventory, and modeling information
- Outline the process for the *2006 PM10 Plan*
- Invite comments and questions



What is PM10?



- PM10 is solid, liquid, or semi-volatile materials (except pure water) in the atmosphere varying in composition and sizes less than 10 microns in diameter.



PM10 and Health

- PM10 is associated with a variety of health risks, including
 - hospitalization for cardiovascular or respiratory disease
 - asthma, reduced lung function
 - acute and chronic bronchitis
 - activity restrictions, work loss, school absenteeism
- Some groups are at a higher risk.



PM10 Standards

	Averaging Time	Concentration
Federal	Annual	50 $\mu\text{g}/\text{m}^3$
	24 Hours	150 $\mu\text{g}/\text{m}^3$
State	Annual	20 $\mu\text{g}/\text{m}^3$
	24 Hours	50 $\mu\text{g}/\text{m}^3$



PM Attainment Status

- The District is designated as a serious nonattainment area for PM10
- Nonattainment status triggers plan requirements
- The District is also designated nonattainment for PM2.5
 - PM2.5 Plan due to EPA in 2008



PM10 Plan Background

- The *2003 PM10 Plan* was adopted in June 2003 and amended in December 2003 and May 2005
- 2003 and 2005 Amendments had a narrow focus; not complete plan revisions
- *2006 PM10 Plan* provides updated information and evaluation required by EPA's Federal Register approval notice for the *2003 PM10 Plan*



2006 PM10 Plan

- Based on mid-course review with latest technical information to determine if the emissions reductions in the *2003 PM10 Plan* are sufficient to attain the NAAQS
- Latest technical information includes:
 - CRPAQS
 - Inventory
 - Monitoring data
- Due To EPA by March 31, 2006



Emissions Inventory



Pollutants

TOG: Total Organic Gases

VOC: Volatile Organic Gases

NOX: Oxides of Nitrogen

SOX: Oxides of Sulfur

PM10: Particulate Matter (< 10 Microns)

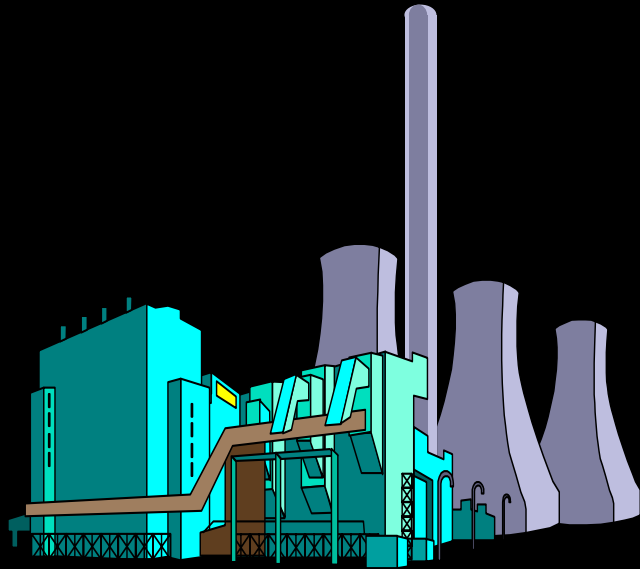


Types of Sources

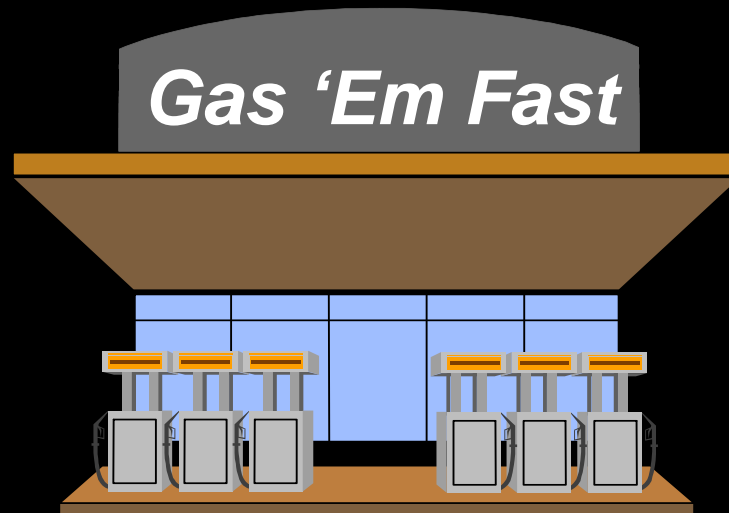
- Stationary
- Area-Wide
- Mobile
- Non-Anthropogenic



Stationary Sources



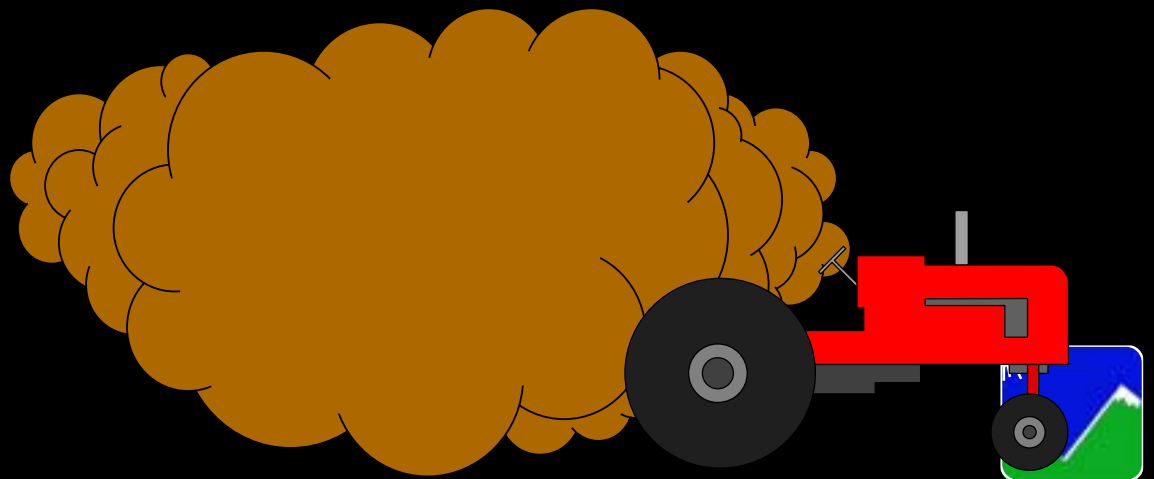
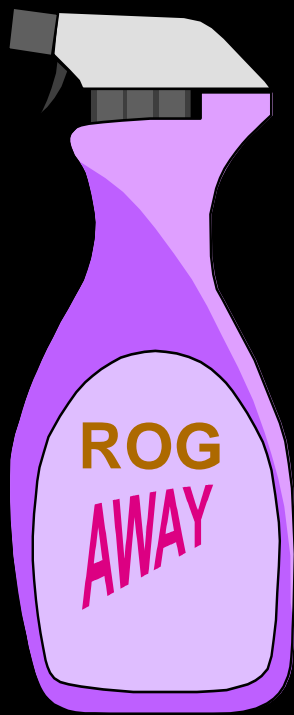
Point



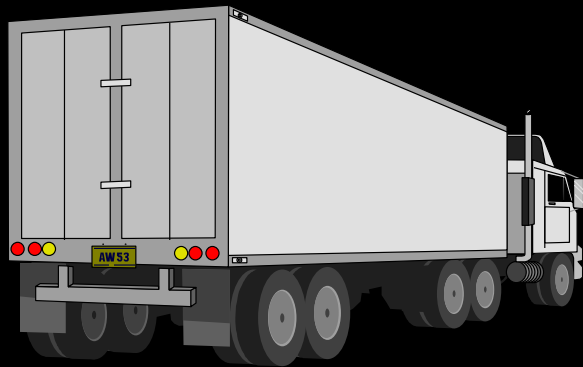
Aggregated
Point



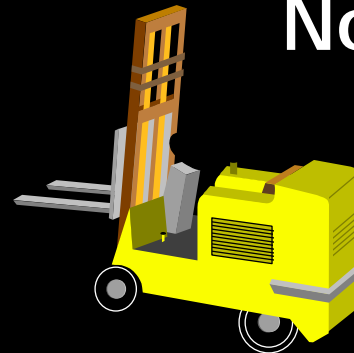
Area-Wide



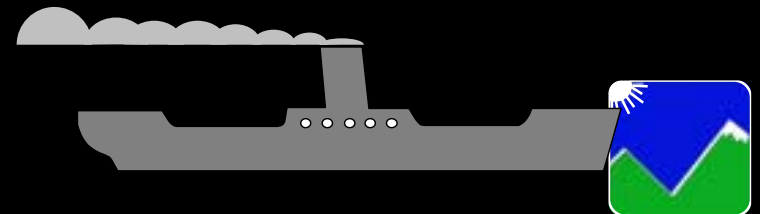
Mobile



Non-Road



On-Road



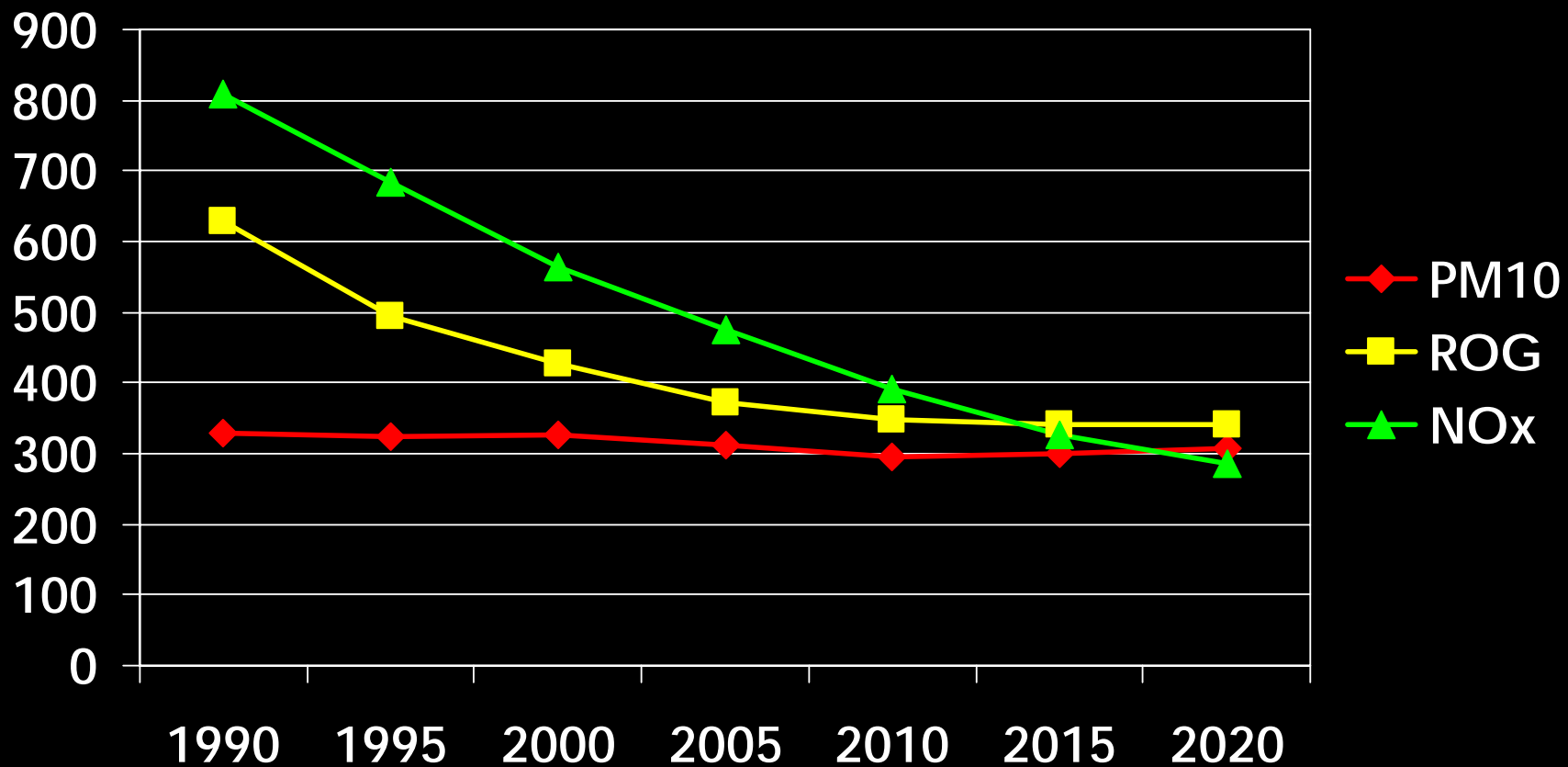
Types of Inventories

- Annual Average
- Planning
 - Summer Planning
 - Winter Planning
- Forecasted
 - Grown and Controlled
- Gridded / Modeling



SJV Emission Levels, 1990-2020

(tons per day)



Emissions Inventory

- More information on emissions inventory is available in the 2006 PM10 Plan and at:

<http://www.arb.ca.gov/ei/ei.htm>

http://www.arb.ca.gov/app/emsinv/ccos/fcemssumcat_cc213.php



Air Quality



PM10 Air Quality Standards

- Daily Standard is $150 \mu\text{g}/\text{m}^3$
 - No more than 1.0 exceedances average over three years
 - Number of exceedances includes an estimate for non-monitored days

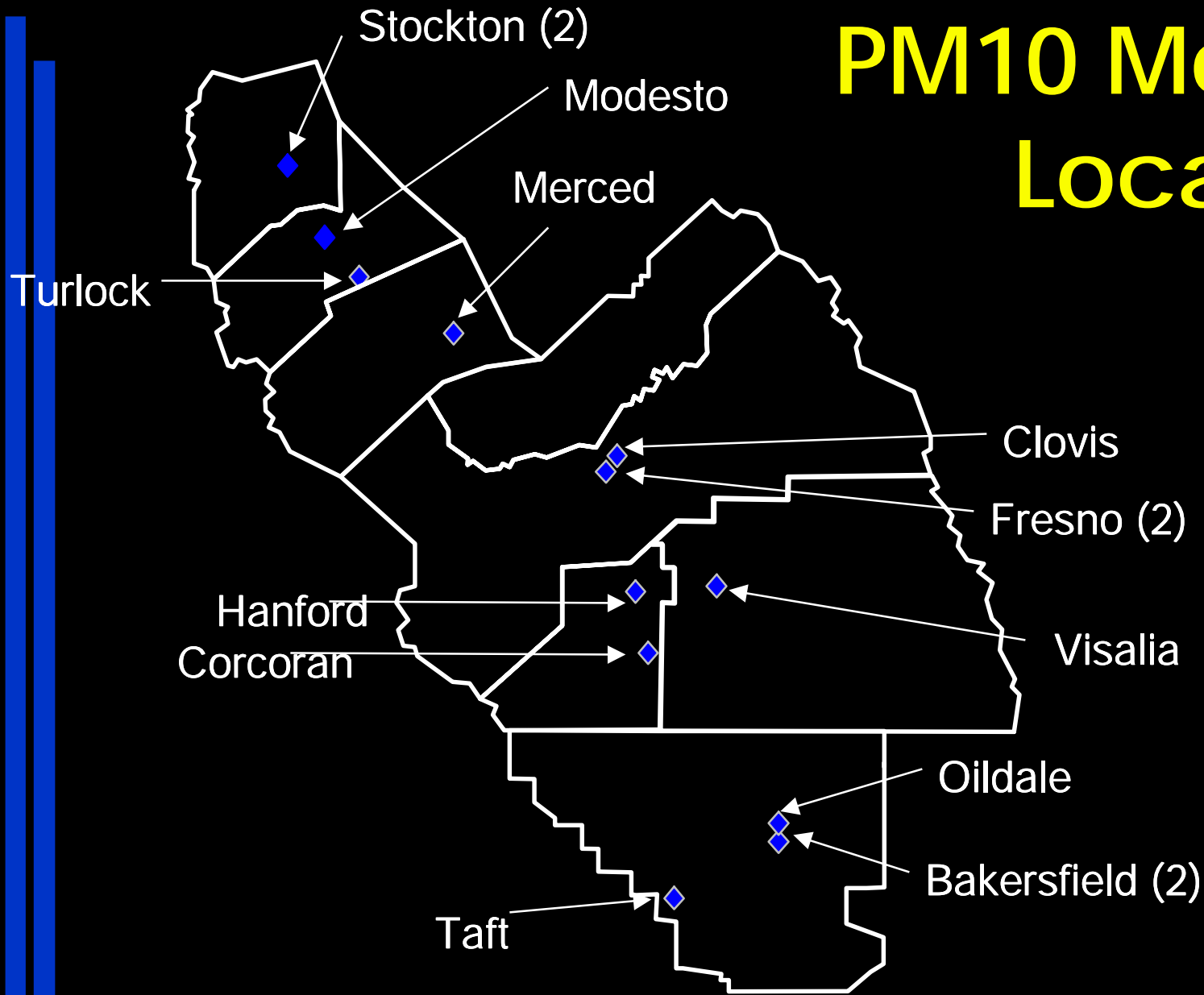


PM10 Air Quality Standards

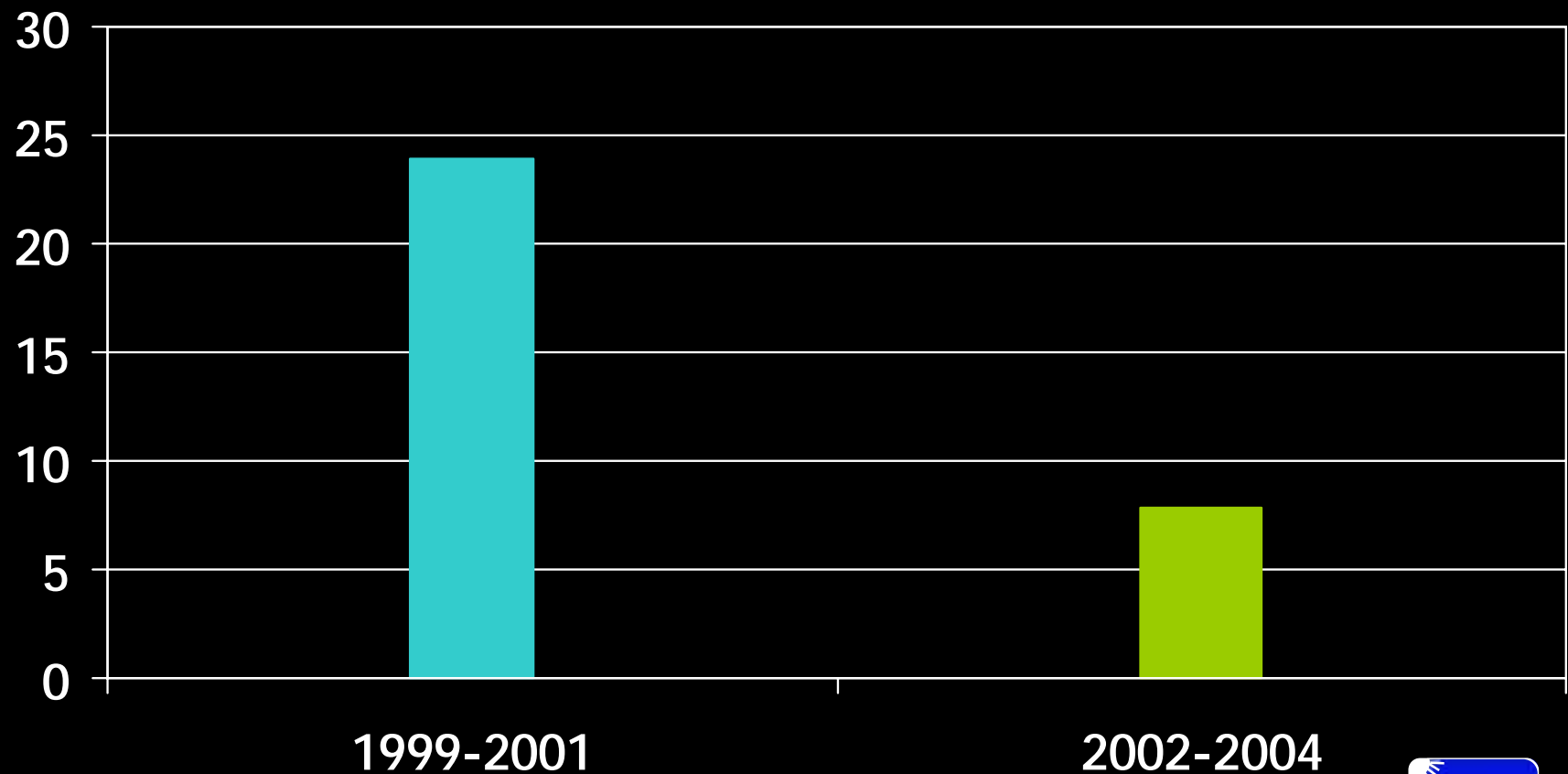
- Annual Standard is $50 \mu\text{g}/\text{m}^3$
 - Average covers three years
 - Use EPA's detailed procedure to calculate the Annual Standard



PM10 Monitor Locations

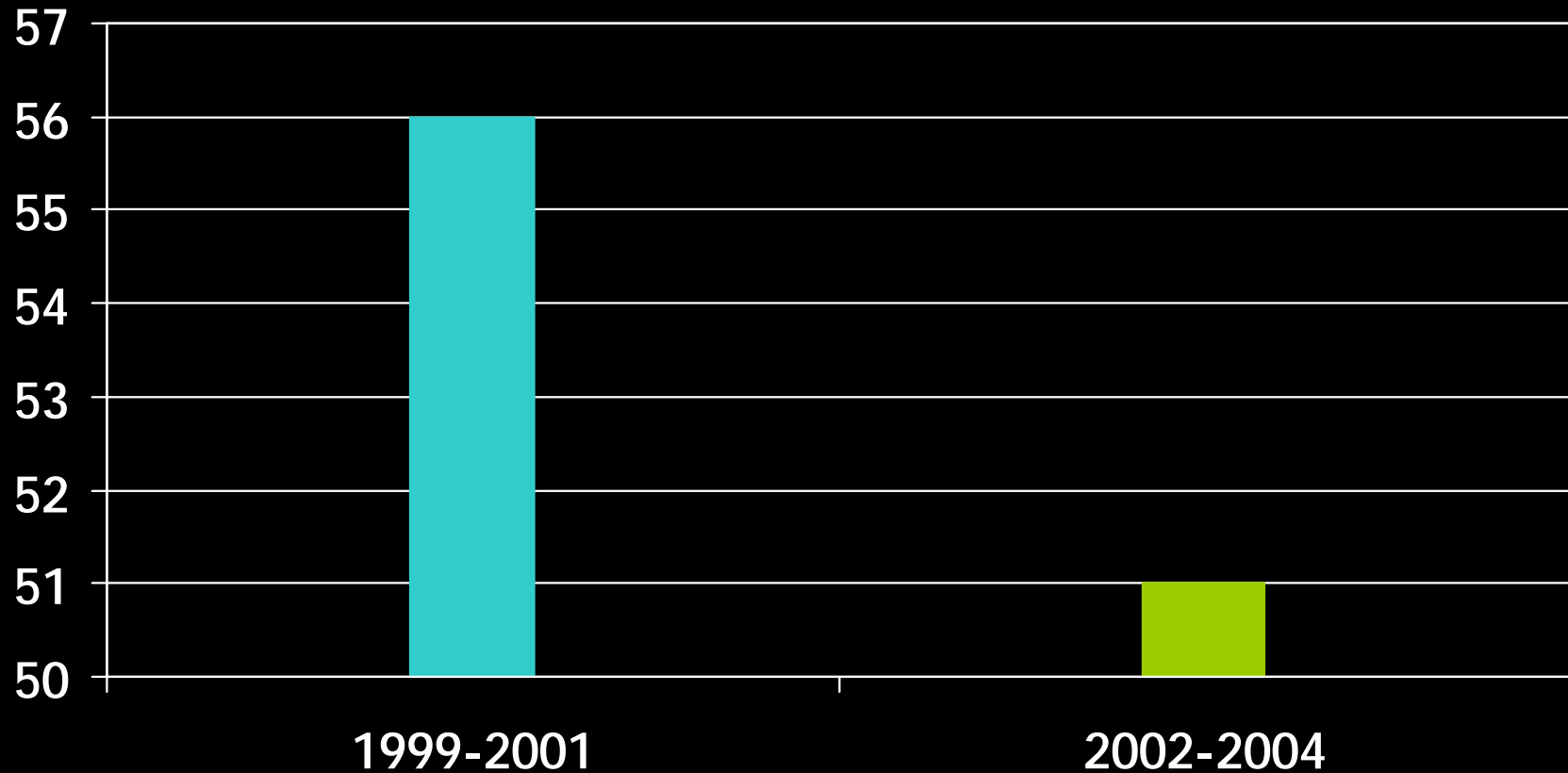


Valley-Wide Estimated Number of Exceedances



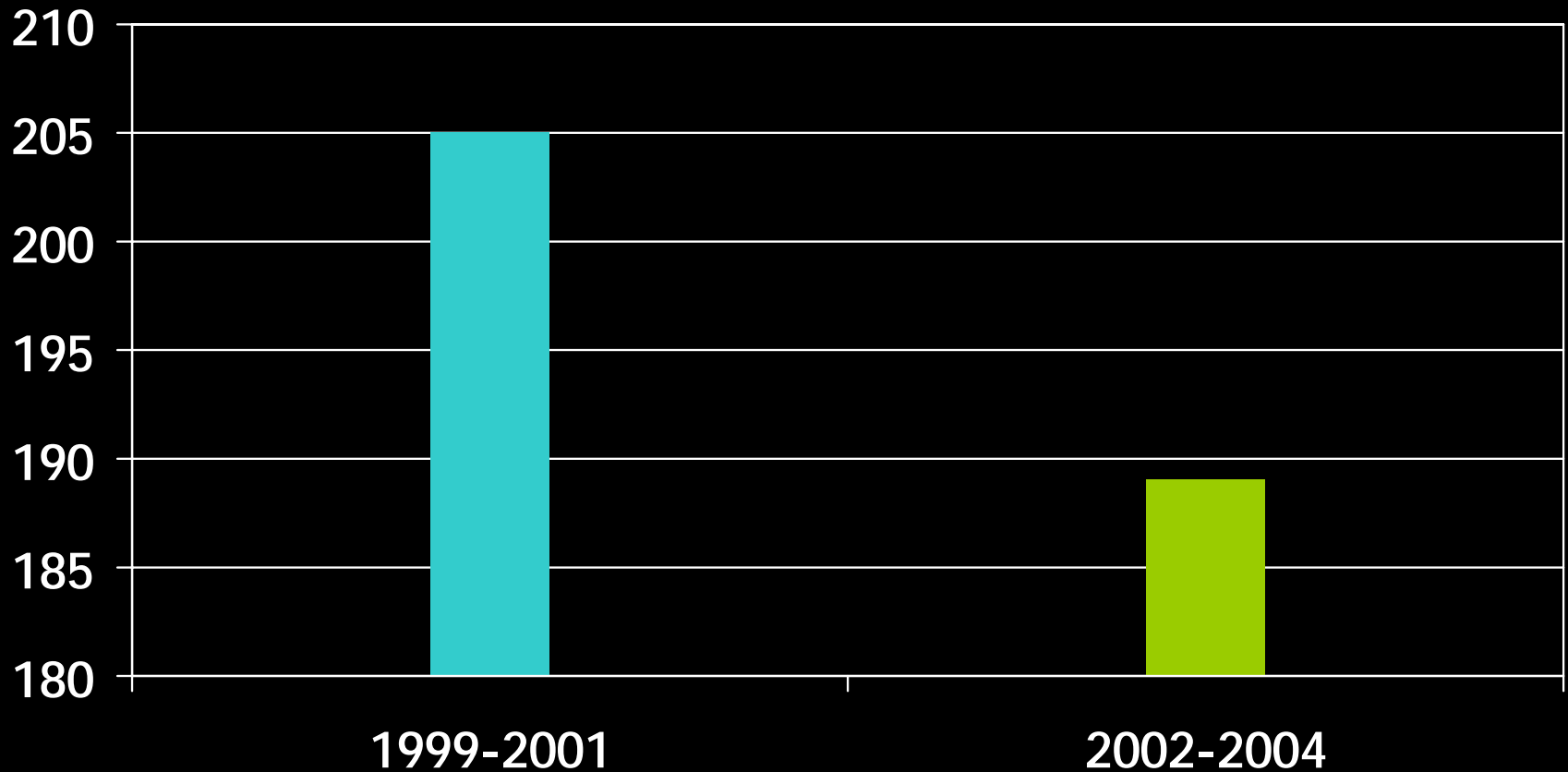
Valley-Wide Annual Average

$\mu\text{g}/\text{m}^3$, based on observed concentrations



Valley-Wide Peak Value

$\mu\text{g}/\text{m}^3$, based on observed concentrations



Trend Analysis

- In any given 3-year period we see meteorological conditions that are both favorable and unfavorable for producing high PM10 levels
- During the winter of 2004-5, effects of new controls in addition to frequent storms led to low PM10 levels
- Fall and winter of 2002 and 2003 had weather conditions that favor elevated PM10, but PM10 did not become elevated
- January 2001 had extreme meteorological conditions for producing high levels of PM10



Air Quality

- More information on air quality is available in the 2006 PM10 Plan and at:

<http://www.arb.ca.gov/aqd/aqdpag.htm>



Modeling Update



Purpose of New Modeling Analysis

- Review whether the program adopted in 2003 is on target to achieve attainment
- Evaluate and consider changes since 2003 plan was adopted
- Update air quality design values at all sites to determine current status
- Utilize advanced information including CRPAQS data analysis, ARB CRPAQS nitrate modeling of winter 2000-2001
- Revise projection of future air quality and review prediction of attainment



SIP Modeling Process

1. Determine sites to evaluate for air pollution episodes and the annual standard
2. Analyze to determine the sources involved in the observed event (receptor modeling CMB)
3. Forecast the effect of anticipated emission trends from implementation of the proposed control strategy (enhanced rollback modeling)
4. Review sufficiency to ensure attainment
5. Compare to observed air quality trends
6. Evaluate control strategy effectiveness



Determine Sites to Evaluate: Episodes

Table 5-1 Federal 24-Hour PM10 Design Values

Site Name	Design Value for the <i>2003 PM 10 Plan</i>	Current Design Value for the <i>2006 PM 10 Plan</i>
Bakersfield - California Ave.	190	110
Bakersfield - Golden #2	205	189
Clovis	155	92
Corcoran - Patterson Ave.	174	168
Fresno - Drummond	186	106
Fresno - First	193	96
Hanford - Irwin St	185	161
Modesto - 14th Street	158	83
Oildale - 3311 Manor St	158	106
Turlock - 900 Minaret Street	157	93

Bold indicates value exceeds standard



Determine Sites to Evaluate: Annual Average

Table 5-2 Federal Annual Average PM10 Design Values

Site Name	Design Value for the <i>2003 PM10 Plan</i>	Current Design Value for the <i>2006 PM10 Plan</i>
Bakersfield - Golden #2	57	51
Fresno - Drummond	50	35
Hanford - Irwin St	53	48
Visalia - Church Street	54	45

Bold indicates value exceeds standard



Analyze to Determine the Sources Involved

- Approach: receptor modeling
- Locations and episodes:
 - Hanford November 4, 2002 transition event
 - Corcoran October 29, 2002 geologic event
 - Bakersfield May 20, 2002 geologic event
 - Bakersfield annual 2002, 2003, 2004 average
- Speciation analysis not available for 2002 episodes; used best fit from prior analysis for episodes evaluated using CMB receptor model



Forecast the Effect of Changes

- Forecast the effect of anticipated emission changes from implementation of the proposed control strategy
- Enhanced rollback modeling methods
 - speciated rollback,
 - considers spatial distribution of emissions,
 - enhanced analysis for nonlinear nitrate particulate chemistry



Forecast the Effect of Changes

Table 5-4 Simulated Future Year 24-hour PM10 Value

Site Name	Revised Design Value	2010 Projection for 2006 PM10 Plan without additional reductions	2010 Projection for 2006 PM10 Plan with additional reductions
Bakersfield-Golden #2	189	168	154
Corcoran, Patterson Ave.	168	144	
Hanford, Irwin St	161	136	

The Bakersfield episode is an exceptional event that will be addressed by a natural and exceptional events policy.

The Corcoran estimated frequency of events of one per year complies with requirements.

All other sites have design values that comply with the federal standard



Forecast the Effect of Changes

Table 5-6 Simulated Future Year Annual PM10 Values

Site Name	Revised Design Value	2010 Projection for 2006 PM10 Plan without additional reductions	2010 Projection for 2006 PM10 Plan with additional reductions
Bakersfield-Golden #2	51	49	

All other sites have design values that comply with the federal standard

Modeling uses the original 57 design value and projects improvement to 49 by 2010.



Observed Air Quality Trend

Year	Bakersfield		Maximum Monthly Observation			
	Site		March	April	May	June
1995	Bakersfield, Golden		53	43	47	85
1996	Bakersfield, Golden		61	72	59	87
1997	Bakersfield, California Ave		83	47	87	46
	Bakersfield, Golden		83	50	57	45
1998	Bakersfield, California Ave		52	66	28	51
	Bakersfield, Golden		49	28	31	29
1999	Bakersfield, Golden		56	45	52	57
2000	Bakersfield, Golden		57	53	46	69
2001	Bakersfield, Golden		46	57	77	61
2002	Bakersfield, Golden		56	64	189	72
2003	Bakersfield, Golden		45	34	76	69
2004	Bakersfield, California Ave		60	83	79	41
	Bakersfield, Golden		54	58	57	49



Observed Air Quality Trend

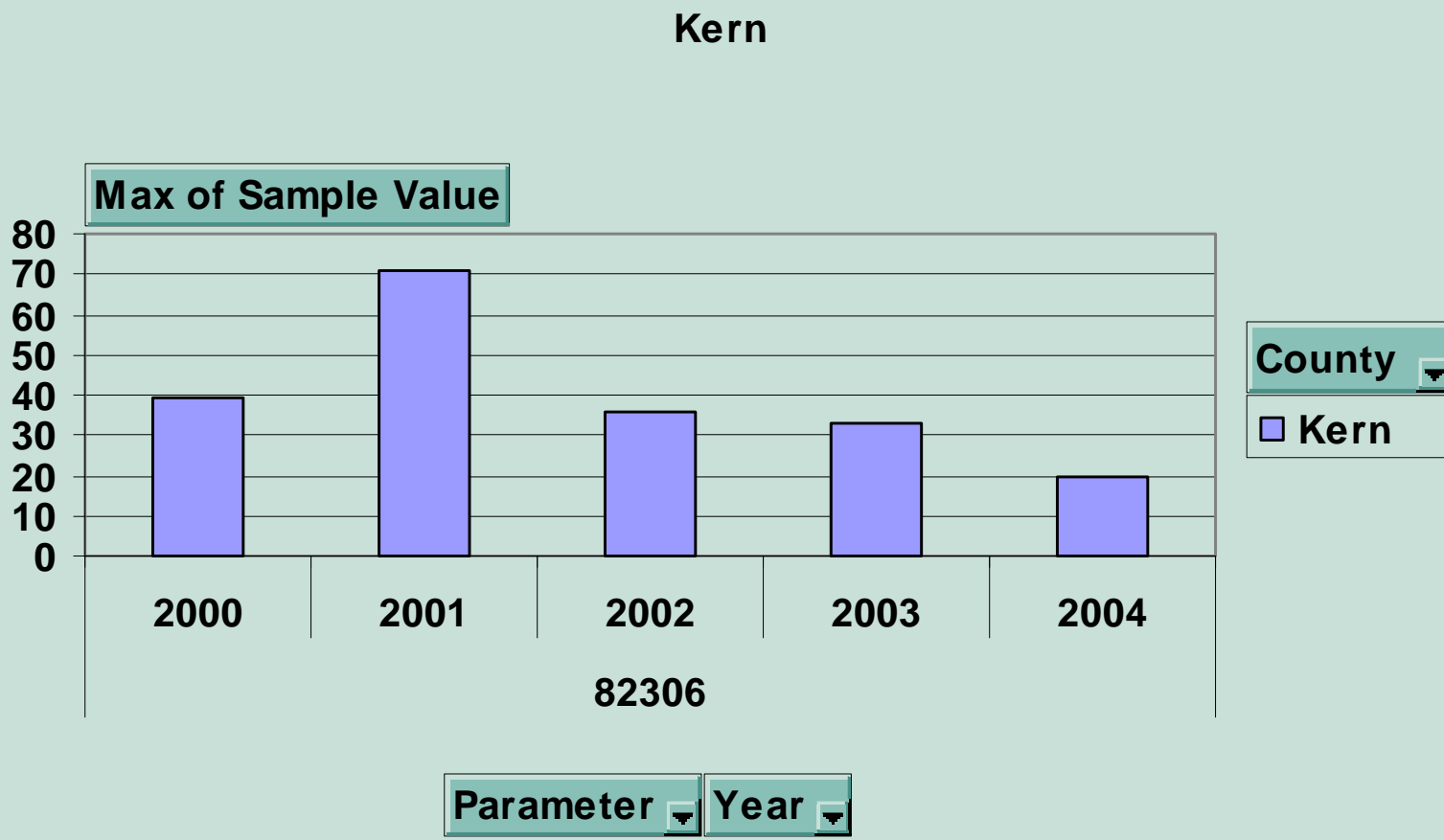
Bakersfield Golden Maximum Monthly Observation

Year	January	February	October	November	December
1995	43	116	132	126	125
1996	53	74	105	153	44
1997	96	80	69	124	39
1998			112	77	159
1999	109	89	135	183	120
2000	143	33	87	145	121
2001	205	101	116	111	36
2002	80	87	95	116	70
2003	71	42	107	67	105
2004	59	43	85	44	57



Observed Air Quality Trend

Maximum PM10 Nitrate in Kern



Observed Air Quality Trend

Hanford Maximum Monthly Observation

Year	January	September	October	November	December
1995	26	80	123	185	83
1996	37	81	120	104	40
1997	73	48	111	143	86
1998	21	86	146	47	109
1999	47	111	143	138	134
2000	31	73	98	119	116
2001	185	77	149	155	46
2002	74	100	124	161	82
2003	48	96	140	91	61
2004	36	102	123	49	47



Observed Air Quality Trend

Corcoran

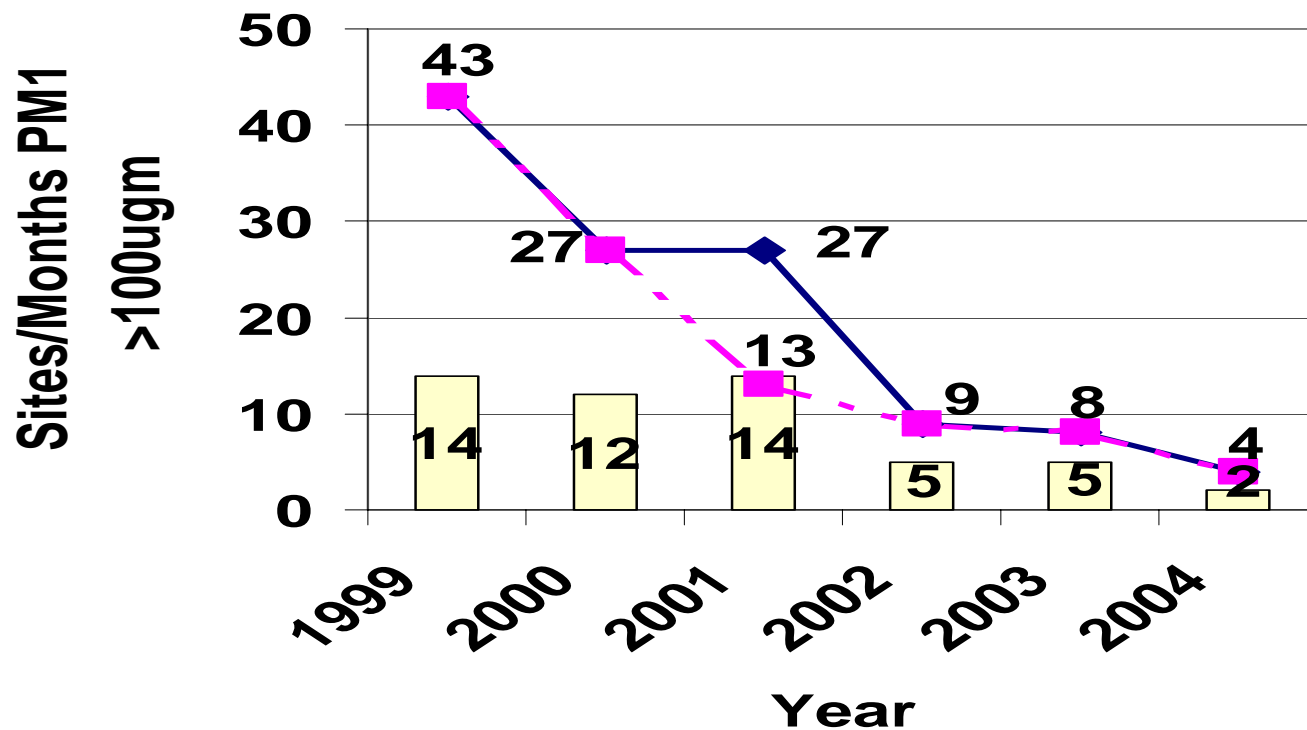
Maximum Monthly Observation

Year	Site	January	September	October	November	December
1995	Corcoran #1	31	77	279	169	96
1996	Corcoran #1	47	72	143	99	42
	Corcoran			141	96	36
1997	Corcoran #1	61	43	124	154	104
	Corcoran	58	44	120	199	103
1998	Corcoran	37	64	128	108	116
1999	Corcoran	106	108	174	146	174
2000	Corcoran	128	65	106	122	87
2001	Corcoran	165	74	148		
2002	Corcoran	71	97	168	134	97
2003	Corcoran	42	92	150	89	65
2004	Corcoran	43	139	139	53	67



Observed Air Quality Trend

SJV PM10 Site-Months over 100 $\mu\text{g}/\text{m}^3$



Control Strategy Effectiveness

- Evaluation of the potential effectiveness of reductions as a control option, supported by CMAQ nitrate particulate evaluation**

Summary of findings	Primary	Secondary	Effective control option
Geologic and Construction	PM10		Yes
Mobile exhaust, tire and brake wear	PM10	ROG	Yes
Vegetative burning	PM10	ROG	Yes
Organic Carbon (stationary and area)	PM10	ROG	No
Ammonium Nitrate		NOx	Yes
		Ammonia	No
Ammonium Sulfate		SOx	No
		Ammonia	No
Geologic , mobile and vegetative burning reduction progress tracked through PM10 ROP, supplemental mobile ROG benefits to secondary PM10 reduction quantified in rollback analysis			

Based on test case evaluation of 50% reduction



Attainment Review

- Updated air quality data shows that most sites already comply with the standards
- Updated modeling analysis confirms projection of attainment by or before 2010
- Air quality trends support projection of attainment before 2010
- Modeling indicates that the control program adopted in the plan is effective and sufficient to achieve attainment
- 2006 mid-course review indicates PM10 Plan is on track for success



Past Progress

- Section 189(c) of the CAA requires quantitative milestones to be achieved every three years until an area reaches attainment

Year	NOx tpd	% red.	5% met?	PM10 tpd	% red.	5% met?
2002	526.6		NA	329.4		NA
2003	512.2	2.73		332.4	-9.11	
2004	498.1	5.41	Yes	331.1	-5.16	
2005	464.6	11.77	Yes	307.9	6.53	Yes



Future Progress

Year	NOx tpd	% red.	5% met?	PM10 tpd	% red.	5% met?
2002	526.6		NA	329.4		NA
2006	446.4	15.23	Yes	302.4	8.20	
2007	436.9	17.03		296.3	10.04	Yes
2008	410.3	22.09	Yes	288.7	12.35	
2009	380.1	27.82	Yes	296.4	10.02	
2010	349.2	33.69	Yes	288.7	12.36	



Control Strategy

- With the current control strategy, the District is meeting attainment projections and 5% RFP commitments
- The District is not proposing changes to the control strategy adopted in the *2003 PM10 Plan* as amended
- The *2006 PM10 Plan* includes contingency measures that can be implemented if future milestones are not met



Related Topics - NEAP

- District is developing a *Natural Events Action Plan (NEAP)* to address and protect public health during high PM10 levels caused by natural events
- Will include a high wind/PM forecasting system and public outreach
- The *NEAP* is due to EPA March 3, 2006
- Draft *NEAP* will post on October 27, 2005
- *NEAP* workshop will be on November 10, 2005



Related Topics – PM Standards Revision

- EPA must sign the proposed rule for new standard by December 20, 2005
- Final rule for new standard must be signed by EPA by September 27, 2006
- Considering replacing the PM10 standard with a PM10-2.5 standard that may use different averaging times and exclude rural PM in favor of urban PM
- PM2.5 standard may also be revised



What's Next

- The comment period for this workshop ends on November 14, 2005
- Proposed *2006 PM10 Plan* posting December 16, 2005
- The *2006 PM10 Plan* to the Governing Board on January 19, 2006



Questions and Comments



Thank you for attending

Send comments to:

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Comments due November 14, 2005 at 5:30 pm

More information - including listservs

available at

www.valleyair.org

