

Update on Development of the 2018 PM2.5 Plan

March 8, 2018
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PM2.5 NAAQS Overview

District preparing attainment strategy to address multiple PM2.5 standards under the federal Clean Air Act

1997 24-hour PM2.5 Standard (65 $\mu\text{g}/\text{m}^3$)

- District submitted Clean Data Finding to EPA with request for finding of attainment

1997 Annual PM2.5 Standard (15 $\mu\text{g}/\text{m}^3$)

- 5% Plan

2006 24-hour PM2.5 Standard (35 $\mu\text{g}/\text{m}^3$)

- Attainment Deadline 2024 (includes 5 year extension)

2012 Annual PM2.5 Standard (12 $\mu\text{g}/\text{m}^3$)

- Attainment Deadline 2025

District's Strategy has Significantly Improved Air Quality in the Valley

- District/ARB have adopted numerous attainment plans
 - Toughest stationary/mobile air regulations in the nation
 - Adopted over 600 stringent rules and regulations (over 80% reduction in stationary source emissions)
 - Groundbreaking rules serve as model for others
- \$40 billion spent by businesses on clean air
- Strong incentive programs (\$1.9 billion in public and private investment reducing 136,000 tons of emissions)
- Public education and participation
 - Build public support for tough measures adopted
 - Urge air friendly behavior by public
- Through these combined efforts, Valley's air quality better than any other time on record

Attainment Plan Strategy Overview

- District and ARB agree that integrated ozone/PM2.5 strategy must be pursued to address latest federal standards
 - NOx emission reductions contribute to attainment of both PM2.5 and Ozone
 - Ensure that resources invested to attain PM2.5 standards also advance attainment of new 2015 Ozone Standard
 - Strategy should focus on NOx emission reductions while also leaving no stone unturned for direct PM2.5 emission reductions
- Federal Clean Air Act does not provide for a “black box” for PM2.5 like it does for ozone
- Attainment of federal standards requires significant increase in funding for incentive-based measures

Proposed Attainment Strategy

- Will contain new measures that apply valleywide
- Will contain new measures focused on reducing emissions in “hot-spot” regions with most difficult attainment challenge
 - Targeted use of incentive grants
 - Targeted regulations
 - Reduced future regulatory burden for specific regions
 - Reduced overall cost to all regions by achieving attainment of federal standards more expeditiously
 - For regions that may face more stringent future measures, added regulatory cost will be mitigated by added incentives
- Supplemented with proposed Community-Level Targeted Strategy that will focus on reducing public exposure to pollution sources of local concern

Need for Hot-Spot Strategy

- Under federal Clean Air Act, entire Valley is designated as not meeting standard if only handful of high concentrations occur at a monitor at the worst location, at the worst time
- Traditional Approach:
 - Quantify reductions needed at worst locations
 - Identify measures needed to bring worst locations into attainment
 - Impose same controls throughout entire Valley
- Hot-Spot Strategy:
 - Focus strategies on hot-spot regions
 - Facilitate greater cost-effectiveness (reduce overall costs)
 - May be the only path available to reach attainment

Hot-Spot Strategy Considerations

- Hot-spot-based strategy will not include any rollback or relaxation of existing regulatory requirements
- Shifting incentive dollars to “hot-spot” areas may reduce grant opportunities in other areas
 - Can be offset by reducing future regulatory burden
- District ARB and EPA believe the hot-spot strategy is permissible under existing law
- Supplemented with proposed Community-Level Targeted Strategy that will focus on reducing public exposure to pollution sources of local concern
 - Modeling demonstrates that reductions from some measures, even at great cost, do not measurably reduce PM_{2.5} concentrations at Valley’s design value sites
 - Anecdotal evidence demonstrates that emissions from some sources cause periodic short-term localized nuisance

Community-Level Targeted Strategy

- Modeling demonstrates reductions from some measures do not measurably reduce PM2.5 concentrations at Valley's design value sites
 - Anecdotal evidence demonstrates that emissions from some sources cause periodic short-term localized nuisance
- Strategy will identify communities and sources of pollution through air monitoring data, public complaints regarding localized sources of air pollution, and health risk assessments
- Strategy will give Valley head start in addressing mandates under recently enacted Assembly Bill 617 which requires community monitoring and BARCT for facilities subject to Cap and Trade program
- Once targeted communities and sources are identified, District will develop technologically and economically feasible measures to control emissions
- Pending availability of funding, incentive-based strategies partnering with affected sources will be preferred strategy

Public Engagement Process

Public Workshops

- December 1, 2016 - ARB Workshop
- December 7, 2016 - District Scoping Public Workshop
- March 9, 2017 - District Public Workshop
- September 26, 2017 - District Public Workshop
- May 8, 2017 - District Public Workshop
- May 18, 2017 - District Public Workshop
- September 26, 2017 - District and ARB co-hosted Public Workshop
- **March 8, 2018 – District Public Workshop**

Public Advisory Workgroup

- January 11, 2017 - Air Quality Modeling
- January 25, 2017 - ARB Mobile Source Measures
- February 9, 2017 - District Measures
- April 12, 2017 - Update on Air Quality Modeling and Measures
- November 14, 2017 - Update on PM2.5 Attainment Strategy

Monthly Public Meetings

- District Governing Board
- Citizens Advisory Committee
- Environmental Justice Advisory Group

Stationary Source Control Measures

- Building off existing stringent requirements, new potential stationary source measures
 - Lower NOx requirements for boilers, steam generators and process heaters
 - Lower NOx requirements for glass manufacturing facilities
 - Lower NOx requirements for non-agricultural engines
 - Electrify agricultural pump engines in areas impacting peak PM2.5 sites where access to electricity is available (incentive-based)
 - Require ultra low-NOx flares for flaring activities and enhance flare minimization practices (District undergoing rule making process)
 - Additional reductions of fugitive dust (directly emitted PM) from cropland tilling and fallow lands through new enhanced conservation management practices
- Each measure will undergo technological and economic feasibility analysis



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Potential Measures in Hot-spot Areas

- New measures focused on reducing emissions in “hot-spot” regions (Kern County, Fresno County, City of Visalia, City of Madera, and City of Corcoran) with most difficult attainment challenge
 - Enhanced levels of incentives to replace wood burning devices with natural gas or propane units
 - More stringent wood burning curtailment (prohibitions for non-registered units at $12 \mu\text{g}/\text{m}^3$ and for all units at $35 \mu\text{g}/\text{m}^3$)
 - Provide incentives for installation of controls and related modifications for existing underfired charbroilers
 - Adopt rule requiring installation of PM controls on large new charbroilers
- Exact funding levels and incentive program details to be finalized

Permitting Action for Underfired Charbroilers

- As first step to enable District to implement measure in cost-effective and expeditious manner, District must initiate permitting of affected operations
 - Similar to other businesses subject to District's air pollution control measures
- District strives to maintain efficient, expedited permitting program at low cost
- Permits provide effective and streamlined method to:
 - Identify and inventory significant sources of air pollution
 - Provide existing businesses with ongoing advice and direction on continued compliance with applicable requirements
 - Provide new businesses with advanced knowledge necessary to plan and design equipment and facilities in compliance with applicable requirements
 - Provide District with effective means to enforce applicable requirements
 - Urge eligible businesses to take advantage of District incentive grants
- District to conduct workshop to amend charbroiler rule (Rule 4692) in April 2018



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Central Valley Summit on Alternatives to Open Burning of Ag Waste

- The San Joaquin Valley has the toughest restrictions on ag burning in the state (SB705 – 2003 Florez)
- District operates a comprehensive Smoke Management System
 - Until 2014, restrictions reduced ag burning by 80%
 - Exceptional drought and biomass industry demise threaten progress
- Without cost-effective and feasible alternatives, the Valley may have to roll back the successful measures that have reduced emissions from open burning of agricultural waste
- Board directed staff to convene Central Valley Summit on Alternatives to Open Burning of Agricultural Waste as part of efforts to identify and advance cleaner alternatives
 - 2-day Summit on November 7-8, 2017, broad participation

Central Valley Summit on Alternatives to Open Burning of Ag Waste (cont'd)

- Lessons Learned
 - Funding cost effective alternatives to open burning of ag waste is mandated by law if current prohibitions are to be retained
 - Air quality impacts from ag burning are well managed through the District's comprehensive Smoke Management System (SMS)
 - Traditional biomass power plants, by themselves, will not be the long-term solution to addressing ag waste issues
 - California as a whole, has a biomass waste disposal issue, not just an ag waste disposal issue; includes ag waste, urban waste, tree mortality waste, high hazard zones



Central Valley Summit on Alternatives to Open Burning of Ag Waste (cont'd)

- **Lessons Learned (cont'd)**
 - Soil incorporation of ag material from orchards themselves as an alternative to open burning shows promise but questions remain
 - Composting of ag material as an alternative to open burning likely not a large scale solution to the ag waste issue
 - Next generation bioenergy solutions appear to be on the verge of broader deployment
 - Air curtain burn boxes may serve as a feasible alternative to reducing emissions from open burning of ag
 - Biochar production as an alternative to open burning of ag waste shows promise but questions remain



Central Valley Summit on Alternatives to Open Burning of Ag Waste (cont'd)

- **Governing Board direction**
 - Withhold rolling back current ag burning prohibitions until further work on exploring and advancing alternatives to open burning is completed
 - Continue to implement the District SMS safeguards to ensure no adverse air quality impact from authorized ag open burning
 - Explore feasibility of utilizing air curtain burn boxes subject to the District's SMS safeguards as an extension of ag operations
 - Continue to support state and federal financial assistance to biomass power industry for the disposal of ag waste
 - Support technology advancement for emerging cleaner alternatives, with priority given to on-the-farm deployable (minimum or no transportation related emissions) and scalable technologies
 - In assessing the feasibility of alternatives to open burning, consider the full life-cycle emissions and impact on air quality



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ARB Mobile Source Actions

- Current Program reduces over 150 tpd of NOx per day
- Reductions from new ARB measures in Mobile Source Strategy
 - More stringent engine standards
 - Requirements for zero emission technologies
 - Low emission diesel fuel standard
- Incentivize turnover to cleanest technologies
 - Heavy duty trucks and buses
 - Ag tractors
 - Off-road equipment
- Further reduce heavy-duty truck emissions through I&M program
- Commitment to reduce an additional 30+ tpd of NOx
 - ARB is working to provide details of these commitments

New Funding for the Valley

- Incentives play a critical role to attaining federal PM2.5 standards
- Board-guided advocacy efforts highly successful in securing significant new incentive funding for the Valley
- \$80 million: Carl Moyer projects and clean trucks that meet Prop 1B guidelines
- \$108 million: Funding Agricultural Replacement Measures for Emission Reductions
- \$6 million: Statewide funding for Ag renewable energy projects (majority to Valley)
- Statewide funding (majority to Valley)
- \$99 million: Statewide funding for Dairy digesters (majority to Valley)
- \$100 million: EFMP/Plus-Up, School buses, and low income CVRP (40% to Valley)
- \$180 million: HVIP (25% to Valley)
- \$8.4 million: AB 617 mandates



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Air Quality Modeling

- Modeling based on foundation of emissions inventories
 - Best available estimates of the amount of pollutants and precursors being emitted from each source type
 - Future-year inventories account for both growth and control
 - Inventories continuously improved
- Plan's inventory is a snapshot reflecting best information at the time for use in modeling & control measures evaluation
- District coordinates closely with ARB to ensure accuracy

Air Quality Modeling (cont'd)

- Modeling necessary to project future air quality under current control strategy, and under proposed control strategy for attainment of air quality standards
- Modeling informs the attainment planning process on what emissions reductions are needed to attain an air quality standard
 - Provides a target for needed emissions reductions
 - Places a focus on which emissions sources could be targeted for further emissions reductions

Air Quality Modeling (cont'd)

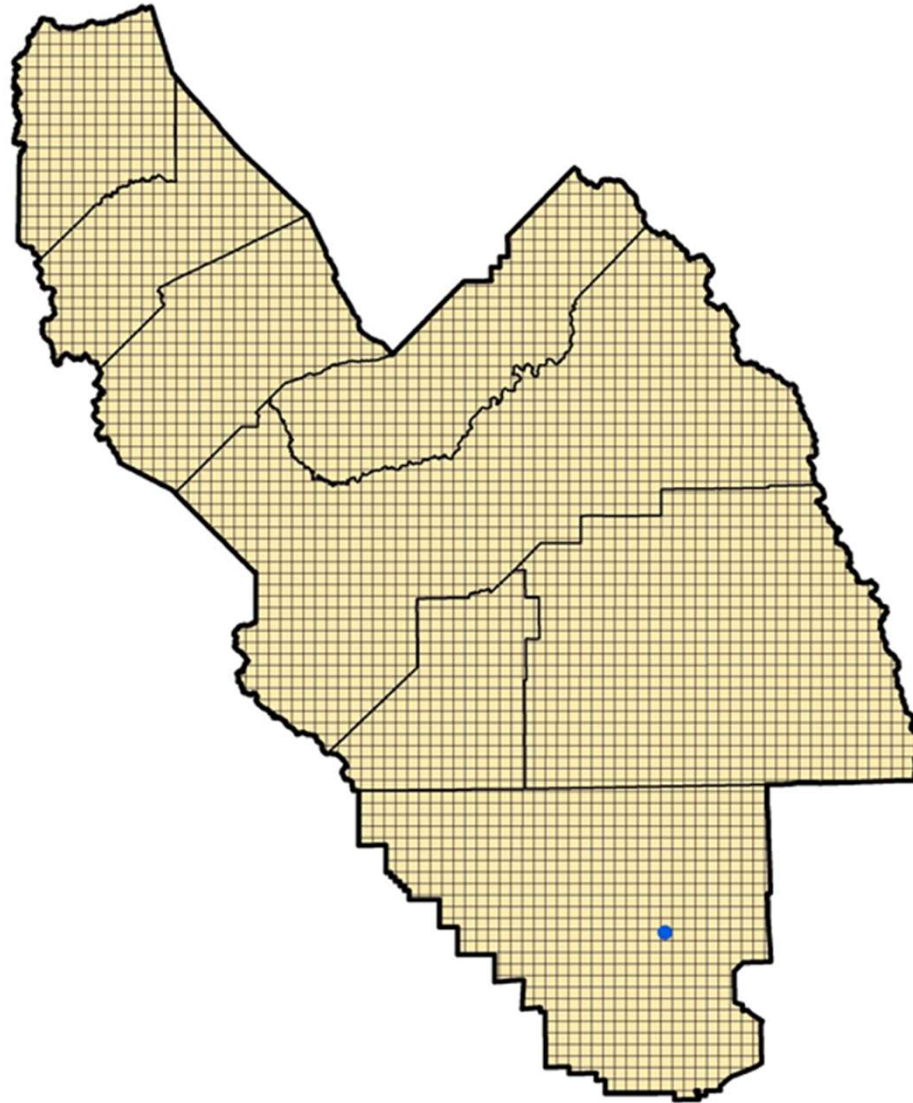
- Air quality modeling uses highly complex computer programs, sophisticated computer hardware, and large databases to predict ambient pollution concentrations given future emission inventory and meteorological scenarios
- These models simulate air quality concentrations in the Valley in a “computerized laboratory” that brings together:
 - Science of emissions generation through spatial/temporal gridding
 - Dynamics of meteorological transport
 - Atmospheric photochemistry
- Air quality modeling fundamental to understanding the Valley’s complex air quality problems
- Many inputs and algorithms in SJV modeling derived from San Joaquin Valleywide Air Pollution Study Agency research (CRPAQS, CCOS)



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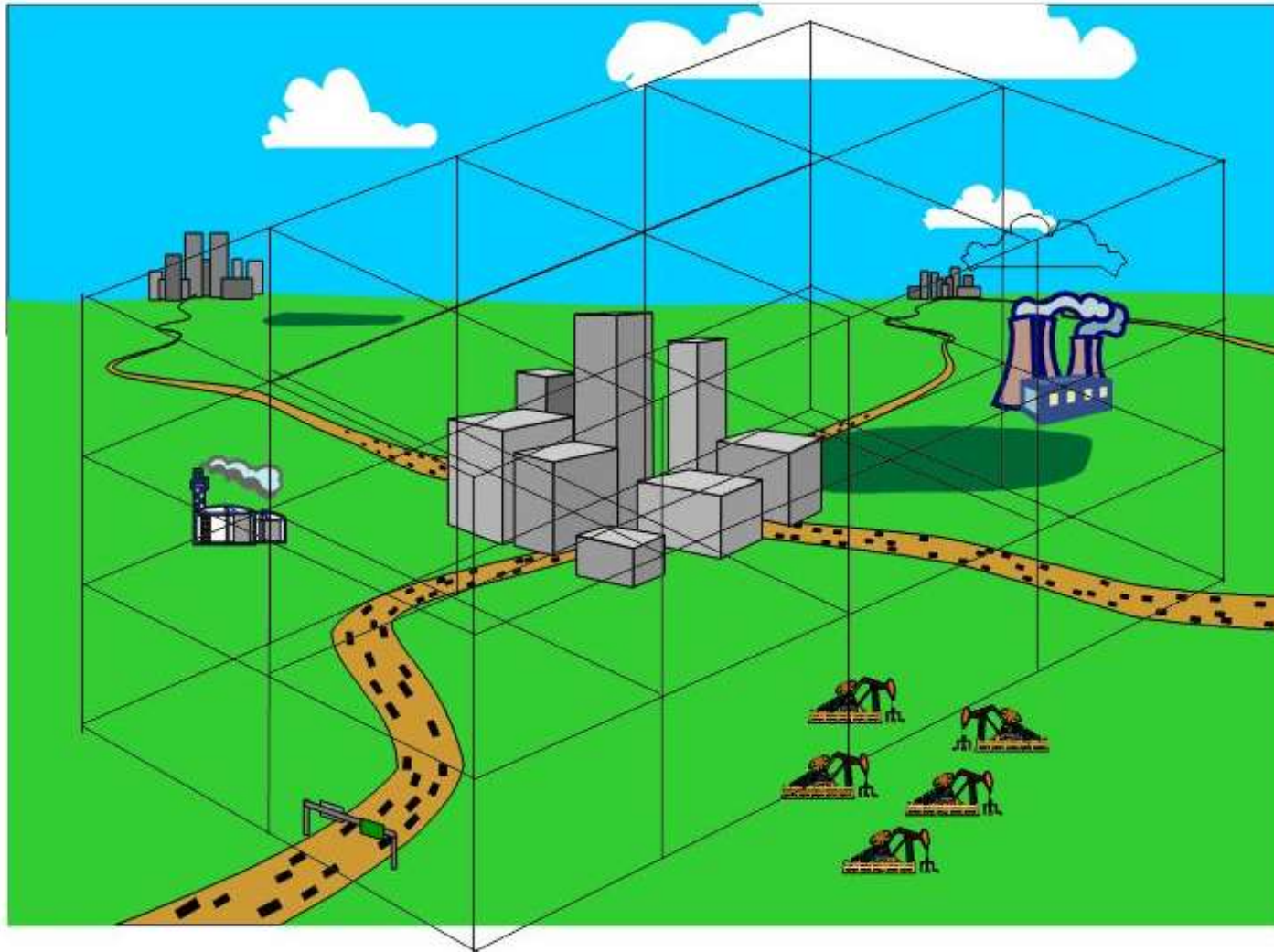
Grid Modeling for the Valley



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Grid Modeling for the Valley



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Modeling Analysis

- Grid modeling depends upon underlying spatial and temporal allocation of emissions for all source categories
 - Each grid cell is evaluated in modeling analysis to appropriately apportion emissions for each inventory category
 - Analysis includes consideration city/county boundaries, roadway networks, point source locations, survey data, and other statewide data sets
 - Grid modeling requires extensive GIS analysis to build representative spatial distributions of emissions, based on best available data
 - Temporal profiles developed to determine when emissions are occurring during the year, month, and day
 - Day specific inventories developed for emissions categories that fall under prohibitory rules, e.g. agricultural burning and residential wood-burning
 - Gridded inventory includes multiple vertical layers to account for emissions being emitted at higher elevations, e.g. aircraft emissions

Modeling Analysis (cont'd)

- Modeling analysis conducted in development of PM2.5 attainment strategy has been extensive and thorough – multiple years of work
- Analysis has included:
 - Review of base year and future year emissions inventories, including various methodologies for key emissions categories
 - Collecting and analyzing new datasets to build more representative spatial distributions of emissions
 - Conducting and supporting research to better understand emissions levels and public behavior for key areas
 - Close and methodical evaluation of control measures being proposed in joint District/ARB strategy to inform which measures are most effective in bringing Valley into attainment

Modeling Analysis (cont'd)

- District and ARB have been working closely together over past several months to ensure accurate modeling and emissions reductions for a number of key areas, including:
 - Spatial distribution of heavy duty trucks
 - Evaluation and modeling of District's Hot-Spot Strategy to ensure emission reductions from measures appropriately applied to correct grid cells within hot-spot boundaries
 - Spatial distribution of underfired charbroilers
 - Accurate accounting of District's agricultural burn program
 - Accurate accounting of additional emission reductions from District's Burn Cleaner program

Modeling Analysis (cont'd)

- Residential Wood Combustion Survey completed in November 2017
 - 3rd party bilingual scientific survey to assess residential wood burning behaviors in Valley (Gomez Research)
 - 1,500 surveys
- District and ARB utilized survey and other information to improve the temporal and spatial distribution of residential wood burning emissions
- District and ARB working closely to ensure accurate reflection of existing and proposed Hot-Spot residential wood burning strategy
- ARB will be incorporating latest assessments into their next modeling run which should be completed in the following weeks



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Next Steps

- Work with ARB to finalize modeling and attainment strategies
- Address any potential emission reductions shortfalls
- Address other Clean Air Act requirements
 - Reasonable Further Progress, Contingency, Quantitative Milestones
- Integrate updated mobile source strategy into the plan
- Assess technological and economic feasibility of proposed stationary source measures
- Finalize proposed plan with specific regulatory and incentive-based measures for public review
 - Host additional public workshop(s)
 - 30-day comment period before presenting final draft to Board
- Present an EPA-approvable plan to Board as soon as possible after robust public process
 - Schedule for adoption depends on completion of modeling and preparation of related necessary planning documents for public review



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Additional Information

- Up-to-date information available at <http://www.valleyair.org/pmplans/>
- Receive email updates on the development of this plan and future air quality attainment plans at <http://www.valleyair.org/lists/list.htm>
- Email comments to airqualityplans@valleyair.org



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Public Comments

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