Update on Development of the 2018 PM2.5 Plan

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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 μg/m³)
- District submitted Clean Data Finding to EPA with request for finding of attainment

1997 Annual PM2.5 Standard (15 μg/m³)
- 5% Plan

2006 24-hour PM2.5 Standard (35 μg/m³)
- Attainment Deadline 2024 (includes 5 year extension)

2012 Annual PM2.5 Standard (12 μg/m³)
- 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 PM2.5 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
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 µg/m³ and for all units at 35 µg/m³)
  – 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
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
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
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).
Grid Modeling for the Valley
Grid Modeling for the Valley
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
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
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
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
Public Comments

webcast@valleyair.org