

**Public Workshop for  
Rule 4702 (Internal Combustion Engines)  
Rules 4306 and 4320 (Boilers,  
Steam Generators, and Process Heaters  
Greater than 5.0 MMBtu/hr)  
and  
Rule 4311 (Flares)**

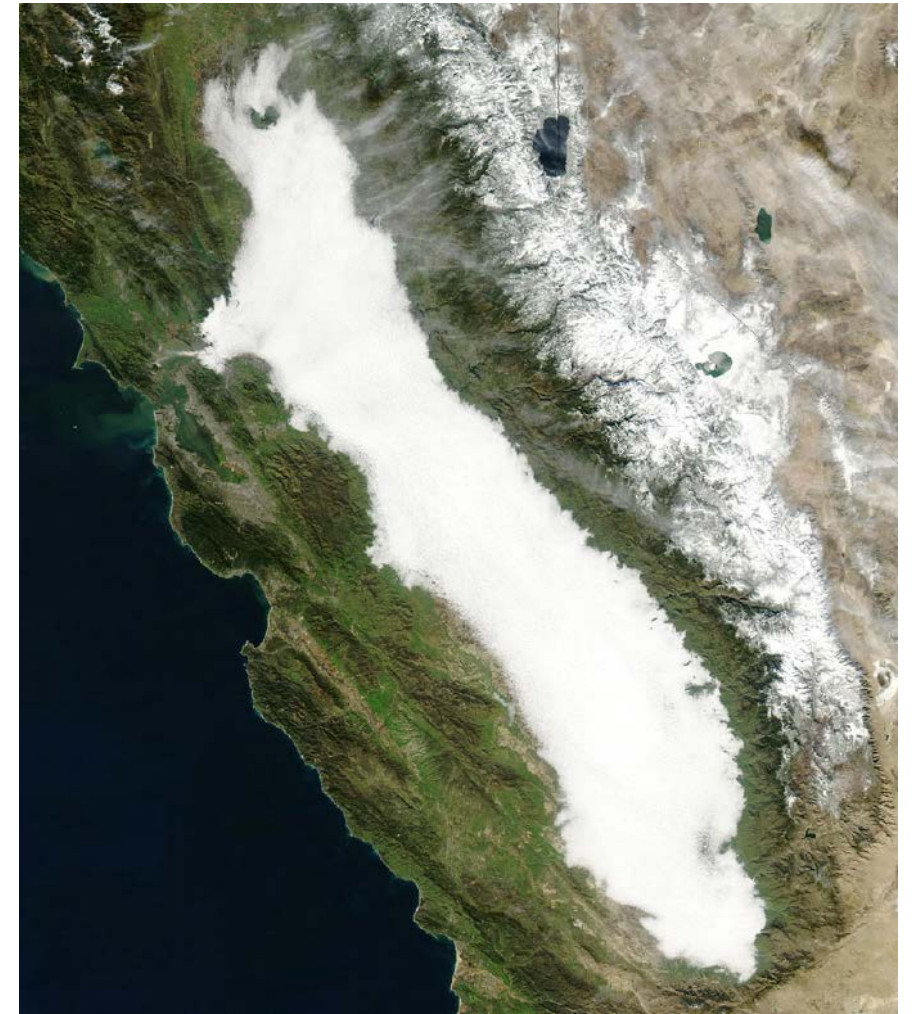
September 24, 2020

[webcast@valleyair.org](mailto:webcast@valleyair.org)

# Rule 4702 (Internal Combustion Engines)

# Valley's Air Quality Challenges

- Valley's challenges in meeting federal air quality standards unmatched due to unique geography, meteorology, and topography
- Valley designated as “Extreme” non-attainment of the 8-hour Ozone NAAQS; “Serious” non-attainment of federal standards for fine particulate matter (PM<sub>2.5</sub>)
  - Substantial emission reductions needed to achieve federal standards – need to go beyond already strict control limits
- Combustion is a significant source of NO<sub>x</sub> emissions, primary precursor to ozone and PM<sub>2.5</sub> formation
  - *2018 PM<sub>2.5</sub> Plan* includes commitment to evaluate opportunities to further reduce emissions from internal combustion engines



# Rule 4702 Overview

- District Rule 4702 applies to internal combustion (IC) engines rated at 25 bhp or greater
  - Spark-ignited (SI) engines: two-stroke, four-stroke, rich-burn and lean-burn, may use many fuels (i.e. natural gas, propane, ethanol, gasoline)
  - Compression-ignited (generally diesel) engines: two-stroke or four-stroke
- Most IC engines in the Valley are used to power pumps, compressors, or electrical generators at public and private facilities
  - Many permitted compression-ignited engines in District used as emergency engines to provide backup power

## Internal Combustion Engine

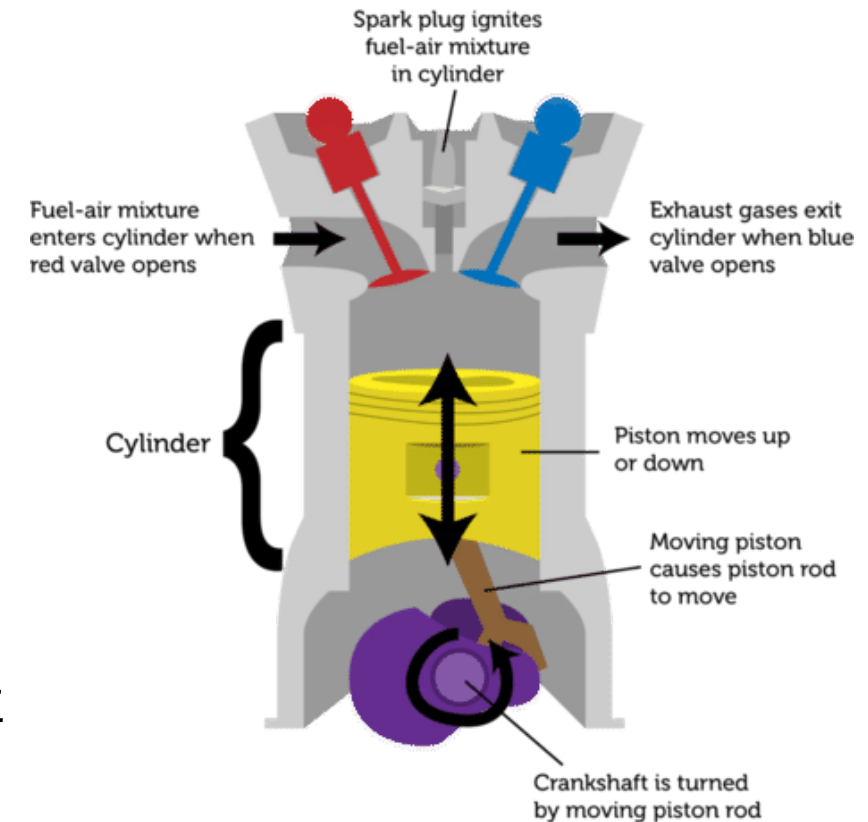


Image credit: C.Auyeung, 2019

# Where do Internal Combustion Engines Operate?

- IC engines are used at the following facility types in the Valley:
  - Oil and gas production facilities
  - Agricultural operations
  - Petroleum refineries
  - Landfills and waste wastewater treatment plants
  - Water districts
  - Schools, universities
  - Electrical power generation facilities
  - Food processing operations



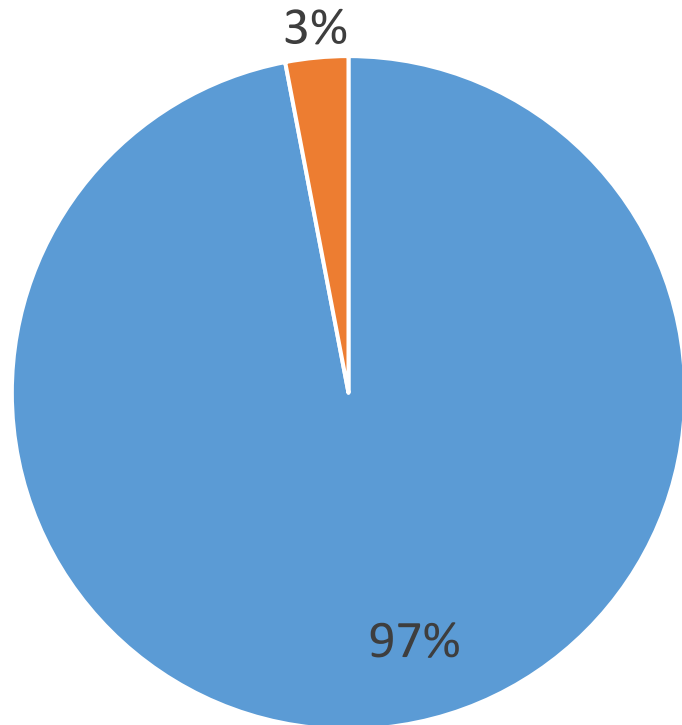
Image credit: EPA, 2013

# Current Rule 4702 Requirements

- District Rule 4702 adopted August 2003, sixth generation rule
  - Rule limits emissions of NO<sub>x</sub>, CO, VOCs, and SO<sub>x</sub>
  - Past amendments established lower NO<sub>x</sub> limits for non-agricultural engines between 25-50 ppmv (rich-burn) and 65-75 ppmv (lean-burn)
  - 2011 amendment further strengthened rule by requiring NO<sub>x</sub> limits as low as 11 ppmv for non-agricultural spark-ignited engines
  - Rule achieved significant reductions in NO<sub>x</sub> and PM emissions from agricultural engines, with significant investment by agricultural operators – past amendments have established limits between 90 – 150 ppmv for ag engines
- Through Rule 4702, NO<sub>x</sub> emissions from IC engines already reduced significantly
  - Achieved 90-96% NO<sub>x</sub> emissions control for non-agricultural rich burn engines, 85-90% emissions control for non-agricultural lean burn engines
  - NO<sub>x</sub> emissions from agricultural engines reduced by 84%

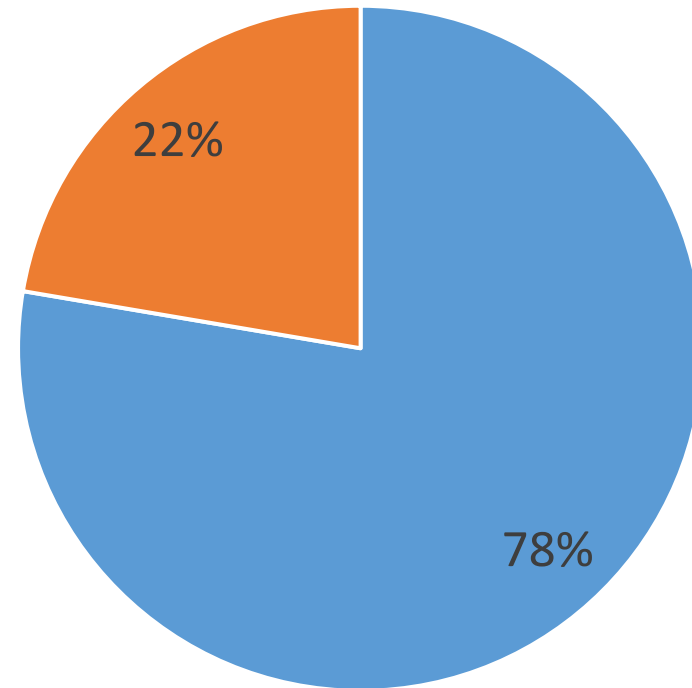
# NOx Emissions from Internal Combustion Engines in the Valley

## All NOx Emissions in the Valley (Mobile, Stationary, & Area Sources)



■ Other NOx Sources ■ IC Engines

## NOx Emissions from Stationary Sources



■ Other Stationary Sources ■ IC Engines

# Emission Reductions Needed from IC Engines

- Valley's challenges in meeting federal air quality standards unmatched due to unique geography, meteorology, and topography
- Substantial reductions needed to achieve PM<sub>2.5</sub> standards – need to go beyond already strict limits
- Commitment in *2018 PM<sub>2.5</sub> Plan* to further evaluate emissions reduction opportunities from IC engines
- District staff are conducting comprehensive review of requirements in other air districts, lowest emission limits being achieved in installations statewide, and costs and feasibility of most effective emission control technologies available



# 2018 PM2.5 Plan Commitment

## Non-Agricultural IC Engines

- Further reduce NOx emissions to extent that such controls are technologically achievable and economically feasible (from 11 ppmv to as low as 7 ppmv)

## Agricultural IC Engines

- Replacement of spark-ignited agricultural engines with electric motors where access to electricity is available, or Tier 4-equivalent engine technologies through incentive-based approach, coupled with regulatory backstop to encourage participation
- Replacement of Tier 3 compression-ignited agricultural engines with electric motors where access to electricity is available, or Tier 4-equivalent engine technologies through incentive-based approach to achieve additional emissions reductions where cost-effective

# Public Process to Amend Rule 4702

- *2018 Plan for the 1997, 2006, and 2012 PM2.5 Standards*
  - Adopted: November 15, 2018
- Public scoping meeting held December 5, 2019
- Regular updates provided at Citizens Advisory Committee (CAC), Environmental Justice Advisory Group (EJAG), and District Governing Board meetings
- Ongoing opportunities for public input throughout rule development process

# Available Ag Pump Replacement Incentive Program

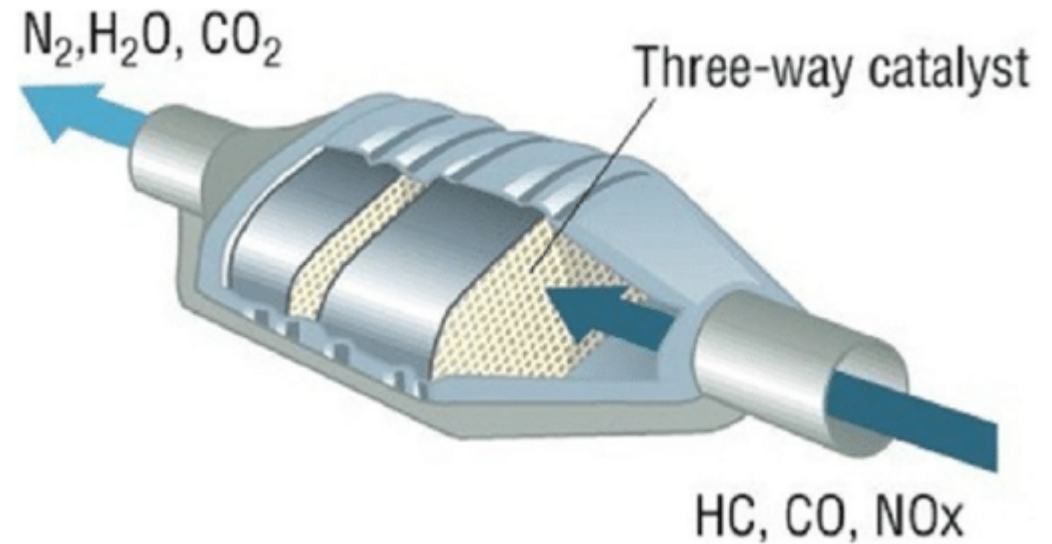
- District operates robust incentive program to provide funding for replacement of older ag engines with Tier 4 engines or electric motors
- Total program funding of over \$120,000,000
- Funding amounts based on dollar per horsepower from \$90/hp - \$150/hp (additional funding for line extension)
- Incentives have replaced over 7,100 engines, with over 3,000 replaced with electric motors
- More info: <http://www.valleyair.org/grants/agpump.htm>



# Engine Add-On Control Technologies

- **3-Way Catalyst (NSCR)**

Applicable for Rich-Burn Engines: oxidizes hydrocarbons and carbon monoxide, and reduces nitrogen oxides into water, nitrogen and carbon dioxide



- **SCR System**

Applicable for Lean-Burn Engines: injects reagent through a catalyst to convert NO<sub>x</sub> in exhaust to nitrogen & water

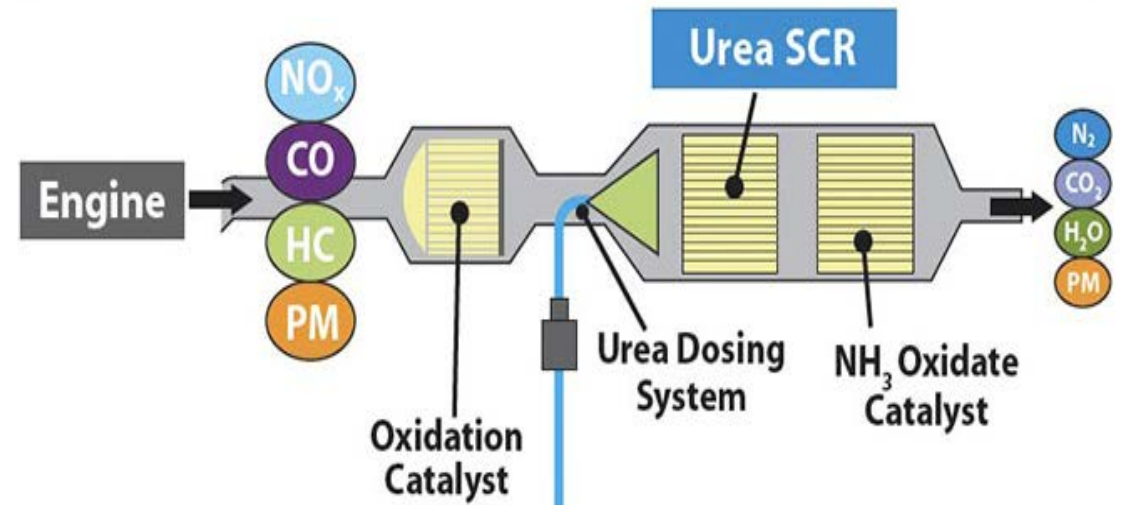


Figure Credits (from top): Laurenzi, 2018; Tomorrow's Technician, 2015

# Available Control Options for IC Engines

- Natural gas engines (spark-ignited)
  - Replace with electric motor where electricity is available
  - Rich burn can retrofit with 3-way catalyst
  - Rich burn can replace with new well-controlled engine
  - Lean burn can retrofit with SCR system
  - Lean burn can replace with new well-controlled rich burn engine
  - Cost-effectiveness varies greatly based on feasibility of retrofit vs. engine replacement
- Diesel engines (compression-ignited)
  - Replace Tier 3 engine with Tier 4 engine
  - Replace Tier 3 engine with electric motor where electricity is available

# Rule 4702 Limits Under Consideration for Non Agricultural Operations

- Rich Burn Waste Gas
  - Lower NOx limit from 50 ppm to as low as 11 ppm
- Rich Burn Cyclic Loaded, Field Gas Fueled
  - Lower NOx limit from 50 ppm to as low as 11 ppm
- Rich Burn Limited Use
  - Lower NOx limit from 25 ppm to as low as 11 ppm
- Rich Burn Not Listed Above
  - Lower NOx limit from 11 ppm to as low as 7 ppm
- Lean Burn Two-Stroke, Gaseous Fueled >50 bhp & <100 bhp
  - Lower NOx limit from 75 ppm to as low as 11 ppm

# Rule 4702 Limits Under Consideration for Non Agricultural Operations (cont'd)

- Lean Burn Limited Use
  - Lower NOx limit from 65 ppm to as low as 11 ppm
- Lean Burn Gas Compression
  - Lower NOx limit from 65 ppm to as low as 11 ppm
- Lean Burn Waste Gas
  - Lower NOx limit from 65 ppm to as low as 11 ppm
- Lean Burn Not Listed Above
  - Lower NOx limit from 11 ppm to as low as 5 ppm
- VOC limits being evaluated to as low as 90 ppm for all categories

# Rule 4702 Limits Under Consideration for Agricultural Engines

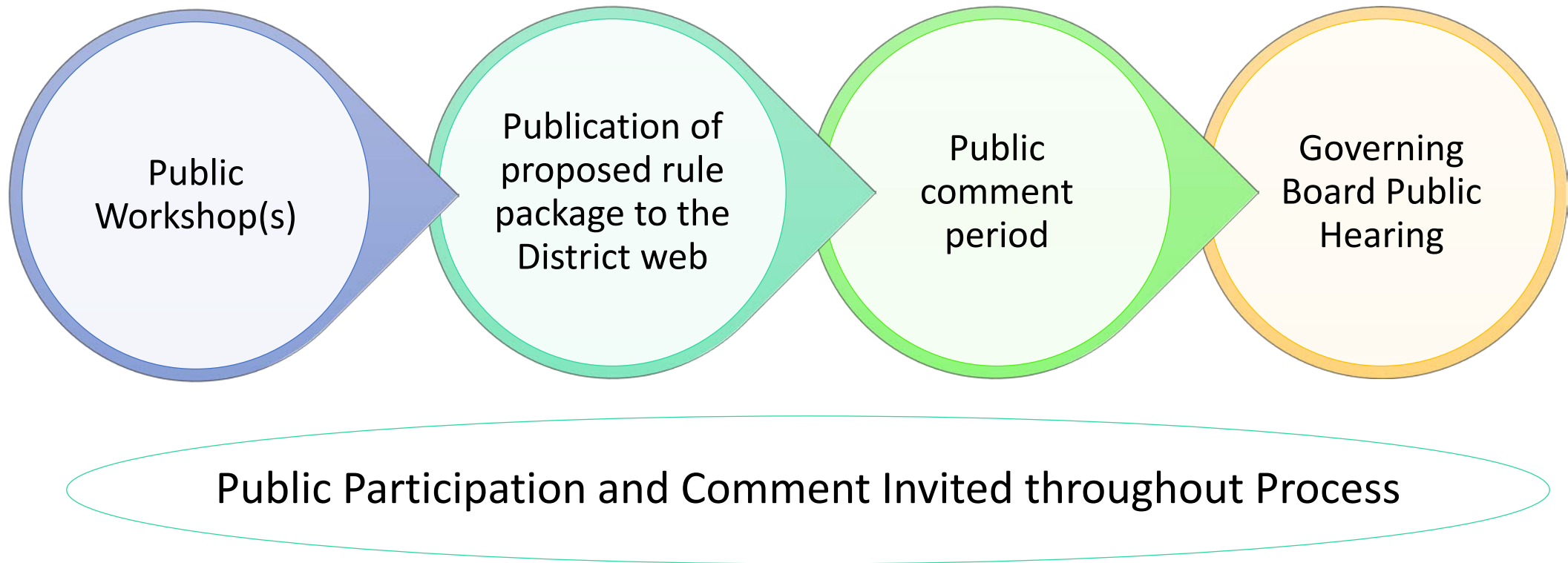
- Natural gas engines:
  - Replacement with electric motors where access to electricity is available, or
  - Replacement with Tier 4-equivalent (~21 ppm NO<sub>x</sub>) engine technologies
  - Incentive-based approach, with regulatory backstop to encourage participation
  - Implementation timeframe in *2018 PM<sub>2.5</sub> Plan* commitment: 2024
- Diesel engines:
  - Replacement of Tier 3 engines with electric motors where electricity is available
  - Replacement with Tier 4-equivalent engine technologies
  - Incentive-based approach where cost-effective
  - Implementation timeframe in Plan commitment: Ongoing



# Next Steps

- District staff analyzing costs and technological feasibility issues associated with meeting the proposed NOx limits
- Socioeconomic Impact Analysis will be conducted to support feasibility analysis
  - Characterize the Valley's economic climate
  - Evaluate economic impacts
  - Prepare Socioeconomic Impact Analysis report
  - Present to Governing Board
- Results of analysis will be included with proposed rule packages

# Next Steps: Public Engagement Process for Rule 4702 Amendment



# Contact

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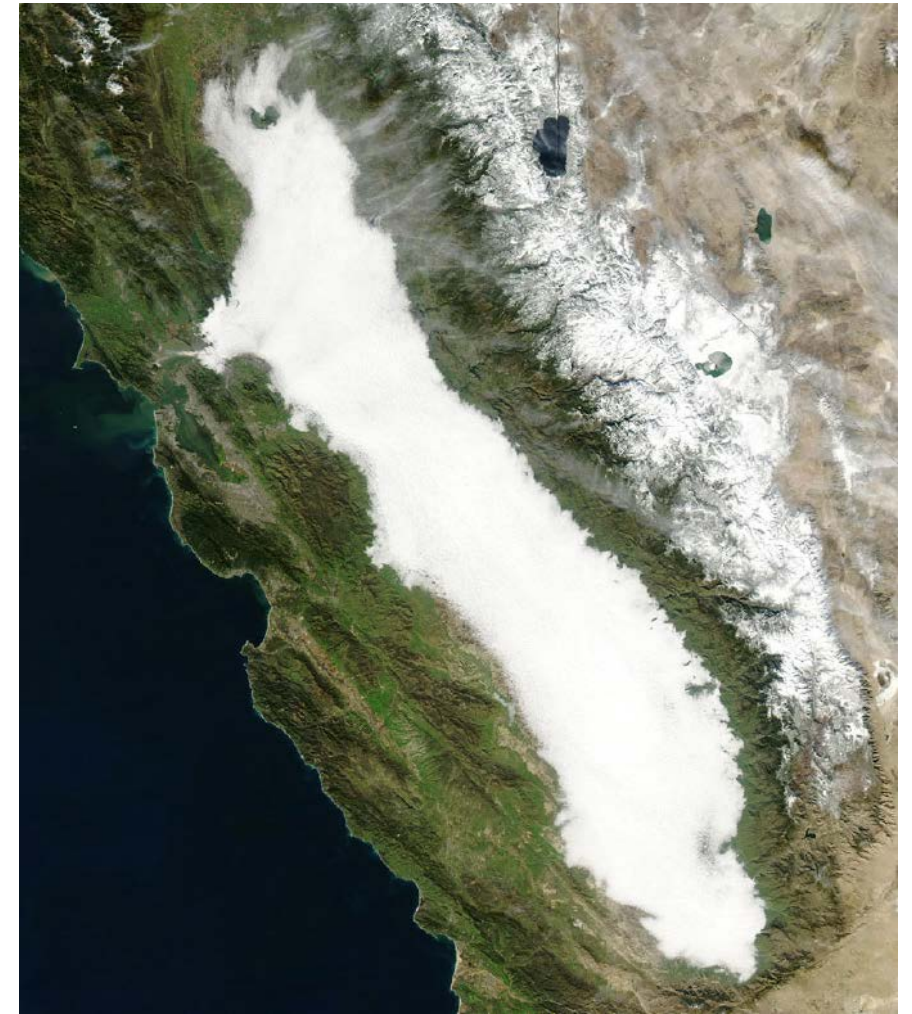
# Open Discussion

[webcast@valleyair.org](mailto:webcast@valleyair.org)

**Rule 4306 (Boilers, Steam Generators,  
and Process Heaters – Phase 3)  
and  
Rule 4320 (Advanced Emission  
Reduction Options for Boilers, Steam  
Generators, and Process Heaters  
Greater than 5.0 MMBtu/hr)**

# Valley's Air Quality Challenges

- Valley's challenges in meeting federal air quality standards unmatched due to unique geography, meteorology, and topography
- Valley designated as “Extreme” non-attainment of the 8-hour Ozone NAAQS; “Serious” non-attainment of federal standards for fine particulate matter (PM<sub>2.5</sub>)
  - Substantial emission reductions needed to achieve federal standards – need to go beyond already strict control limits
- Combustion is a significant source of NO<sub>x</sub> emissions, primary precursor to ozone and PM<sub>2.5</sub> formation
  - *2018 PM<sub>2.5</sub> Plan* includes commitment to evaluate opportunities to further reduce emissions from boilers, steam generators, & process heaters



# Rule 4306 and Rule 4320 Overview

- Rules 4306 and 4320 apply to any gaseous fuel- or liquid fuel- fired boiler, steam generator, or process heater with a total rated heat input greater than 5 MMBtu per hour
- Boilers are external combustion equipment used to produce hot water or steam
- Steam generators are external combustion equipment that convert water to steam; most commonly used in thermally enhanced crude oil production
- Process heaters are combustion equipment that transfer heat from combustion gases to liquid or gas process streams



*Image credit: US EPA, 2013*

# Where do Boilers, Steam Generators, and Process Heaters Operate?

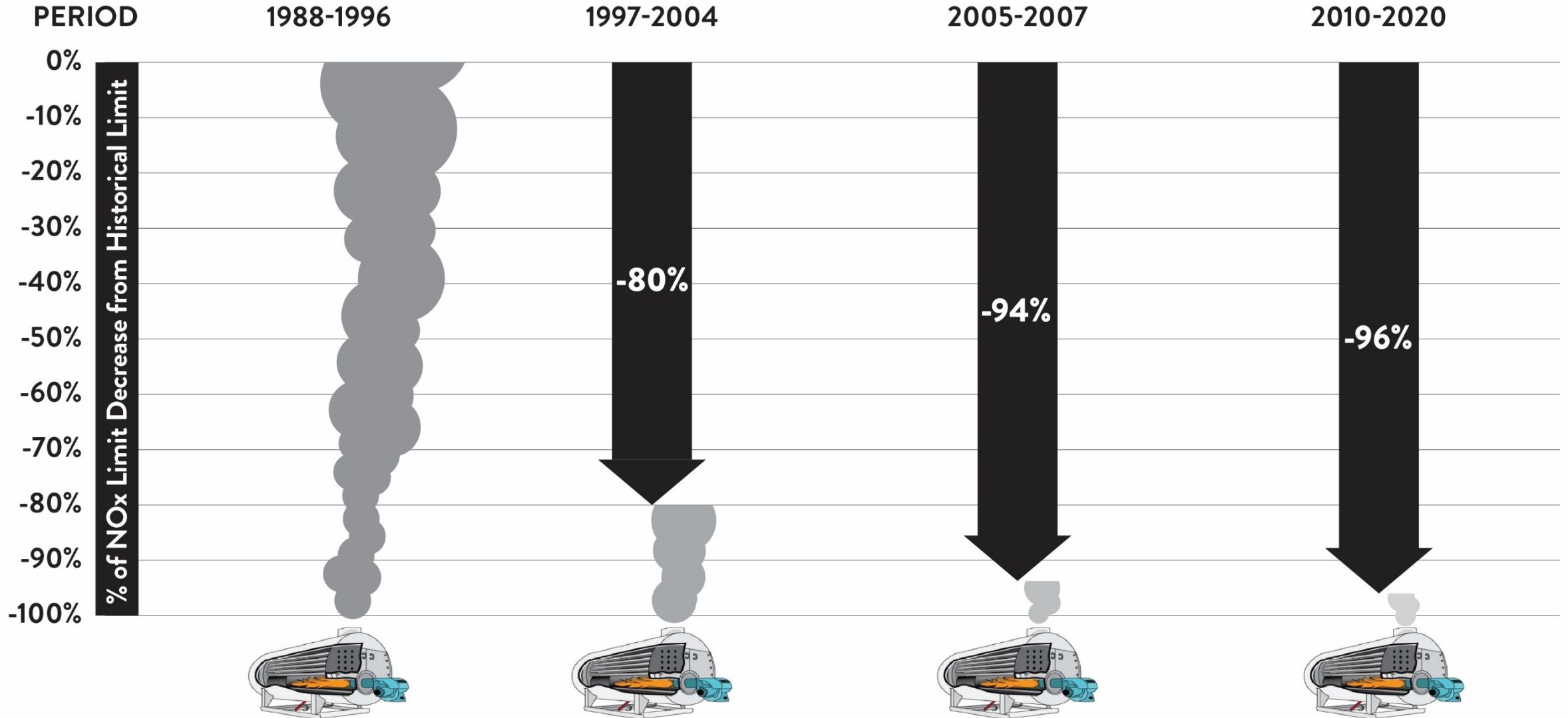
- These units are used at a wide range of facility types in Valley including:
  - Oil and gas production facilities
  - Petroleum refineries
  - Food and agricultural product processing operations
  - Schools, Universities
  - Ethanol Production
  - Hospitals
  - Livestock husbandry operations (dairies, cattle feedlots, etc.)
  - Manufacture and industrial facilities



# Current Rule 4306 and Rule 4320 Requirements

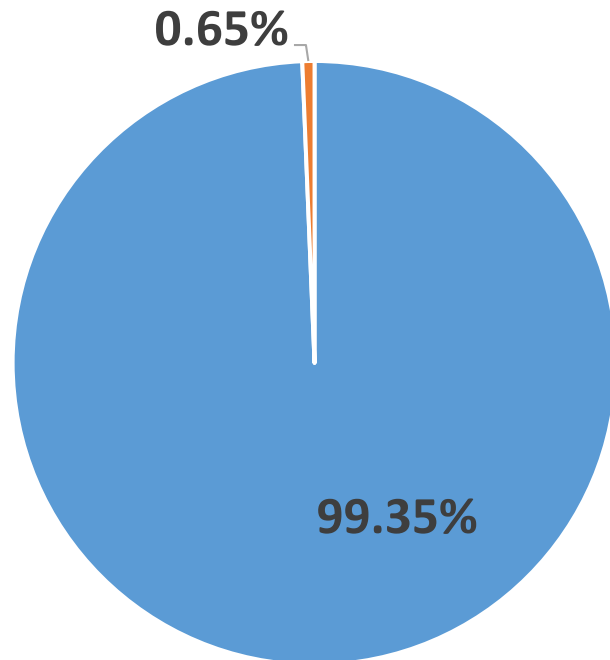
- Rule 4306 establishes specific NO<sub>x</sub> limits for many categories of boiler/steam generator/process heater units
  - NO<sub>x</sub> limits must be met in order to legally operate in District
  - Facilities generally control emissions from sources through combustion modification or exhaust gas treatment
- Rule 4320 establishes more strict NO<sub>x</sub> limits for units in this source category, which are generally technology advancing/forcing. Operators are given three options to comply:
  - Meet specified emission limits, or
  - Pay emissions fee annually to the District, or
  - Comply with low-use provision (fuel limit of  $\leq 1.8$  billion Btu/yr)
- Through these rules, NO<sub>x</sub> emissions from these sources already reduced by 96%

# Decrease in NOx Emission Limits from Boilers, Steam Generators, and Process Heaters with Heat Input Greater than 5 MMBtu/hr



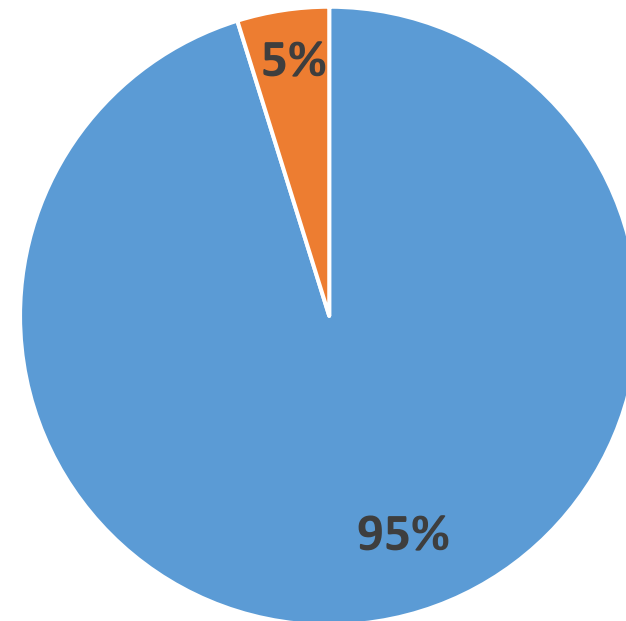
# NOx Emissions from Boilers, Steam Generators, and Process Heaters in the Valley

## All NOx Emissions in the Valley (Mobile, Stationary, & Area Sources)



- Other NOx Sources
- Boilers, Process Heaters, and Steam Generators

## NOx Emissions from Stationary Sources



- Other Stationary Sources
- Boilers, Process Heaters, and Steam Generators

# Units in the San Joaquin Valley

Rule 4320 Category	# Units
Group A. Units 5-20 MMBtu/hr except for Categories C-G Units	302
Group B. Units >20 MMBtu/hr except for Categories C-G Units	228
Group C.1 Oilfield Steam Generators 5-20 MMBtu/hr	8
Group C.2 Oilfield Steam Generators >20 MMBtu/hr	410
Group C.3 Oilfield Steam Generators firing on less than 50% PUC quality gas	142
Group D.1 Refinery Boiler 5-40 MMBtu/hr	2
Group D.2 Refinery Boilers $\geq 40$ MMBtu/hr to $\geq 110$ MMBtu/hr	3
Group D.3 Refinery Boilers >110 MMBtu/hr	1
Group D.4 Refinery Process Heaters 5-40 MMBtu/hr	15
Group D.5 Refinery Process Heaters $\geq 40$ MMBtu/hr	6
Group D.6 Refinery Process Heaters >110 MMBtu/hr	0
Group E. Units with an annual heat input 1.8-30 billion Btu/yr	65
<b>Total</b>	<b>1,182</b>

# Additional Emission Reductions Needed

- Substantial emission reductions needed to achieve PM2.5 standards – need to go beyond already strict limits
- Commitment in *2018 PM2.5 Plan* to evaluate further emissions reduction opportunities from sources including boilers, steam generators, and process heaters
  - Reduce NOx emissions by lowering the NOx emission limits and lowering the more stringent Advanced Emission Reduction Option (AERO) limit for specific classes and categories of units
- District staff have conducted comprehensive review of requirements in other air districts, lowest emission limits being achieved in installations statewide, and costs and feasibility of most effective emission control technologies available

# Public Process to Amend Rules 4306 and 4320

- *2018 Plan for the 1997, 2006, and 2012 PM2.5 Standards*
  - Adopted: November 15, 2018
- Public scoping meeting held December 5, 2019
- Public workshop held July 30, 2020
- Regular updates provided at Citizens Advisory Committee (CAC), Environmental Justice Advisory Group (EJAG), and District Governing Board meetings
- Ongoing opportunities for public input throughout rule development process

# Potential NOx Control Technologies Being Evaluated

- Ultra-low NOx burners (ULNBs)
  - ULNBs control fuel and air mixing to improve flame structure resulting in less NOx formation
  - Can be installed on most units
- Additional oxygen flow controls, flue gas recirculation, and tuning
- Selective Catalytic Reduction
  - Converts NOx to N<sub>2</sub> and water with catalyst by adding a reactant such as ammonia or urea to exhaust gas
- Solar-powered and electric units

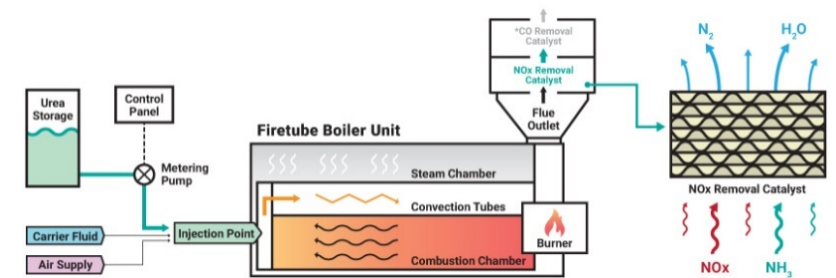
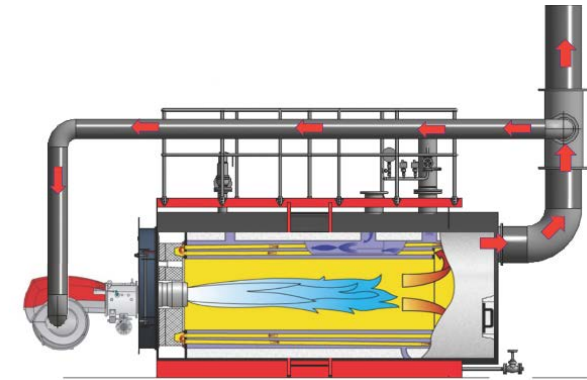


Image credits (from top): Webster Combustion Technology, LLC; Robert Bosch, LLC; RF MacDonald Co.

# Proposed Rule 4306/4320 NOx Limits

Category A 5-20 MMBtu/hr	Number of Units	Current Rule 4306 NOx Limit	Proposed Rule 4306 NOx Limit	Proposed Rule 4320 NOx Limit	Compliance Date
Fire Tube Boilers	178	15 ppm	7 ppm <sup>1</sup>	5 ppm	12/31/23
Units at Schools and Colleges	9	15 ppm	9 ppm	--	12/31/23
Digester Gas Fired Units	2	15 ppm	9 ppm	--	12/31/23
Thermal Fluid Heaters	3	15 ppm	9 ppm	--	12/31/23
Any Other Units	110	15 ppm	9 ppm <sup>2</sup>	5 ppm	12/31/23
Category B ≥ 20 MMBtu/hr	Number of Units	Current Rule 4306 NOx Limit	Proposed Rule 4306 NOx Limit	Proposed Rule 4320 NOx Limit	Compliance Date
Fire Tube Boilers >20 to ≤75	83	9 ppm	7 ppm <sup>1</sup>	5 ppm	12/31/23
Any Other Units >20 to ≤75	59	9 ppm	7 ppm <sup>1</sup>	2.5 ppm	12/31/23
Units >75	86	9 ppm	5 ppm <sup>3</sup>	2.5 ppm	12/31/23

<sup>1</sup> Units permitted at 9 ppm or less have until December 31, 2029 to meet 7 ppm

<sup>2</sup> Units permitted at 12 ppm or less have until December 31, 2029 to meet 9 ppm

<sup>3</sup> Units permitted at 7 ppm or less have until December 31, 2029 to meet 5 ppm



# Proposed Rule 4306/4320 NOx Limits (cont'd)

Category C – Oilfield Steam Generators	Number of Units	Current Rule 4306 NOx Limit	Proposed Rule 4306 NOx Limit	Proposed Rule 4320 NOx Limit	Compliance Date
>5 and $\leq$ 20 MMBtu/hr	8	15 ppm	9 ppm	6 ppm	12/31/23
>20 and $\leq$ 75 MMBtu/hr	276	15 ppm	9 ppm	5 ppm	12/31/23
>75 MMBtu/hr	134	15 ppm	7 ppm	5 ppm	12/31/23
Units fired on less than 50% PUC Quality Gas	142	15 ppm	15 ppm	5 ppm	12/31/23

# Proposed Rule 4306/4320 NOx Limits (cont'd)

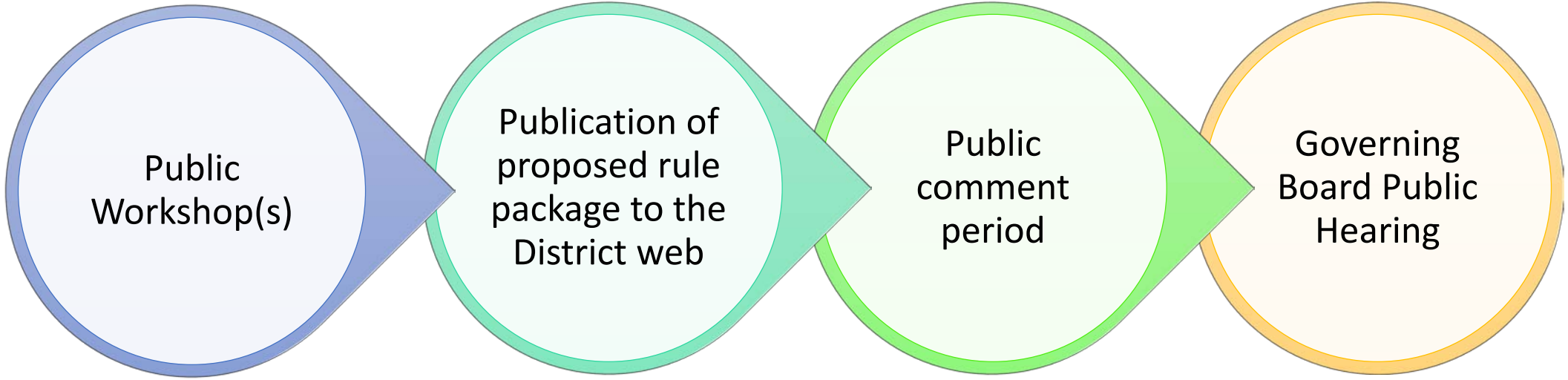
Category D – Refinery Units	Number of Units	Current Rule 4306 NOx Limit	Proposed Rule 4306 NOx Limit	Proposed Rule 4320 NOx Limit	Compliance Date
Boilers >5 and ≤40 MMBtu/hr	2	30 ppm	30 ppm or 5 ppm*	5 ppm	12/31/23
Boilers >40 MMBtu/hr to ≤110 MMBtu/hr	4	30 ppm	9 ppm	2 ppm	12/31/23
Boilers >110 MMBtu/hr	1	5 ppm	5 ppm	2 ppm	12/31/23
Process Heaters >5 and ≤40 MMBtu/hr	15	30 ppm	30 ppm or 9 ppm*	5 ppm	12/31/23
Process Heaters >40 MMBtu/hr to ≤110 MMBtu/hr	6	30 ppm	15 ppm	2 ppm	12/31/23
Process heaters >110 MMBtu/hr	1	5 ppm	5 ppm	2 ppm	12/31/23

\*Upon replacement

# Next Steps

- District staff analyzing costs and technological feasibility issues associated with meeting the proposed NOx limits
  - Specific considerations for different industries/types of applications and types/sizes of units
- Socioeconomic Impact Analysis will be conducted to support feasibility analysis
  - Characterize the Valley's economic climate
  - Evaluate economic impacts
  - Prepare Socioeconomic Impact Analysis report
  - Present to Governing Board
- Results of analysis will be included with proposed rule packages

# Next Steps: Public Engagement Process for Rule 4306 & 4320 Rule Amendment Development



Public Participation and Comment Invited throughout Process

# Rule 4306 and 4320 Contact

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boilers\\_and\\_heaters](http://lists.valleyair.org/mailman/listinfo/boilers_and_heaters)

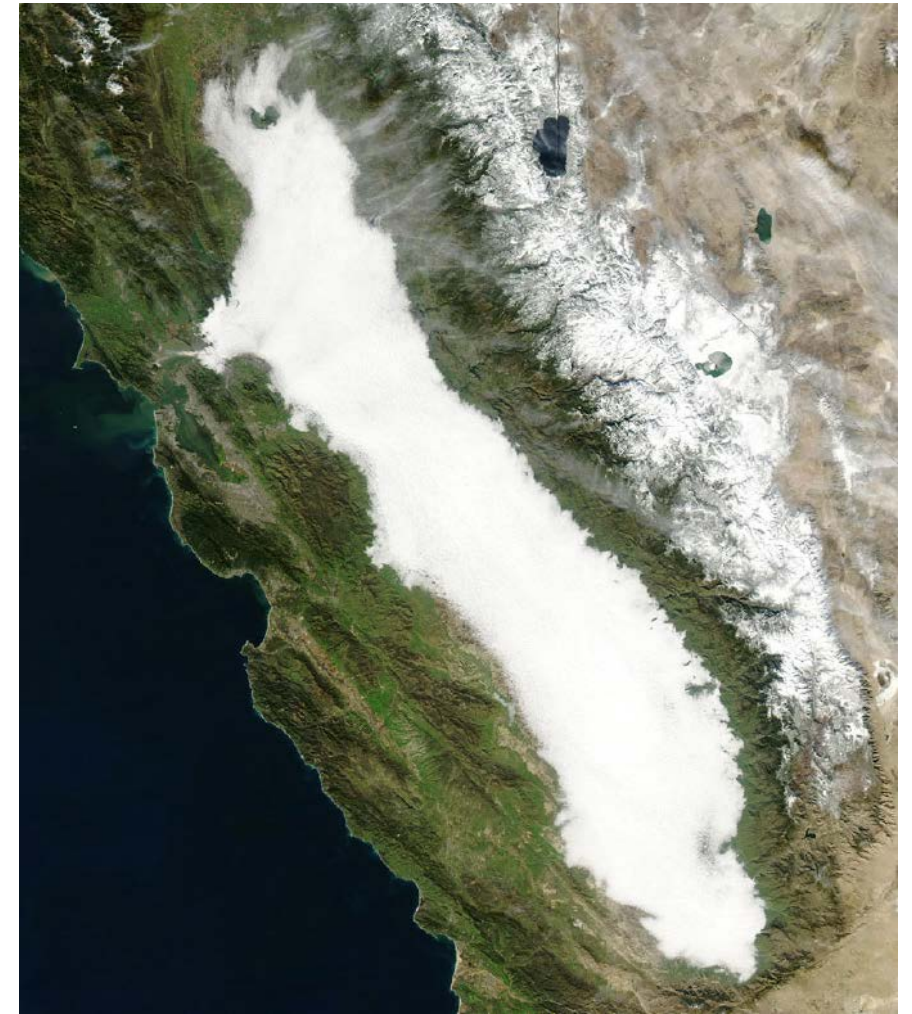
# Open Discussion

[webcast@valleyair.org](mailto:webcast@valleyair.org)

# Rule 4311 (Flares)

# Valley's Air Quality Challenges

- Valley's challenges in meeting federal air quality standards unmatched due to unique geography, meteorology, and topography
- Valley designated as “Extreme” non-attainment of the 8-hour Ozone NAAQS; “Serious” non-attainment of federal standards for fine particulate matter (PM<sub>2.5</sub>)
  - Substantial emission reductions needed to achieve federal standards – need to go beyond already strict control limits
- Combustion is a significant source of NO<sub>x</sub> emissions, primary precursor to ozone and PM<sub>2.5</sub> formation
  - *2018 PM<sub>2.5</sub> Plan* includes commitment to evaluate opportunities to further reduce emissions from flares





# What is Flaring?

- Flaring is a high temperature oxidation process used to burn primarily hydrocarbons of waste gases from industrial operations
  - Flares typically have a destruction efficiency of 98% or higher
- Flares act as a safety device during unforeseeable and unpreventable situations, and as an emission control device for air toxics and VOCs
- Two general types of flares: elevated and ground flares
- Operators avoid flaring due to high costs, and implement alternatives where feasible



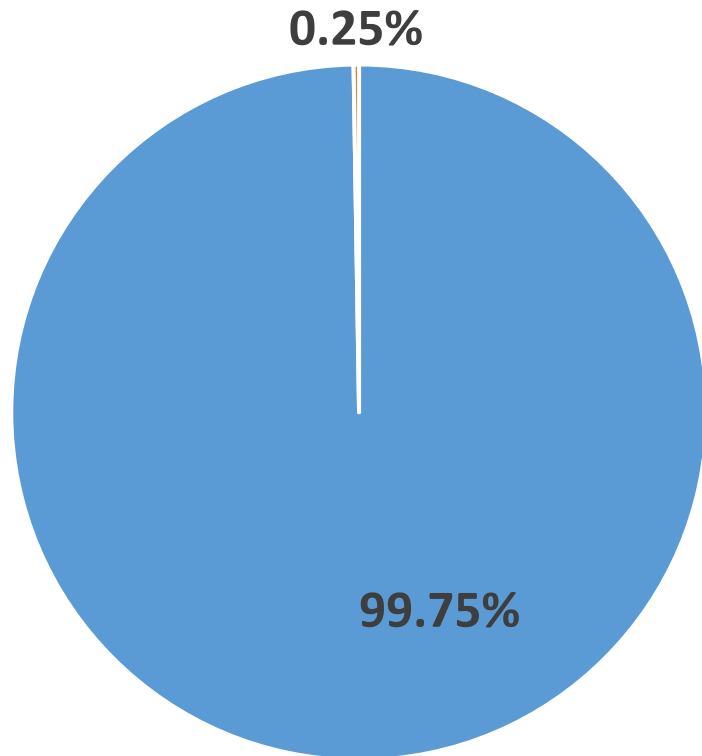
*Image credit: Getty Images, 2018*

# Current District Flare Requirements

- District Rule 4311 (Flares) adopted June 2002, amended in 2006, again in 2009 to add new requirements, including annual reporting and flare minimization practices
  - Rule limits emissions of NO<sub>x</sub>, VOCs, and SO<sub>x</sub> from the operation of flares
- Current requirements for operations with flares include:
  - NO<sub>x</sub> limits as low as 0.068 lbs-NO<sub>x</sub>/MMBtu (53 ppmv NO<sub>x</sub>)
  - Proper operation requirements (i.e., ignition system, heat sensors, etc.)
  - Flare minimization plans
  - Reporting of unplanned flaring event within 24 hours, annual reporting, and reporting of when monitoring system is not operating
  - Vent gas composition monitoring
  - Video monitoring

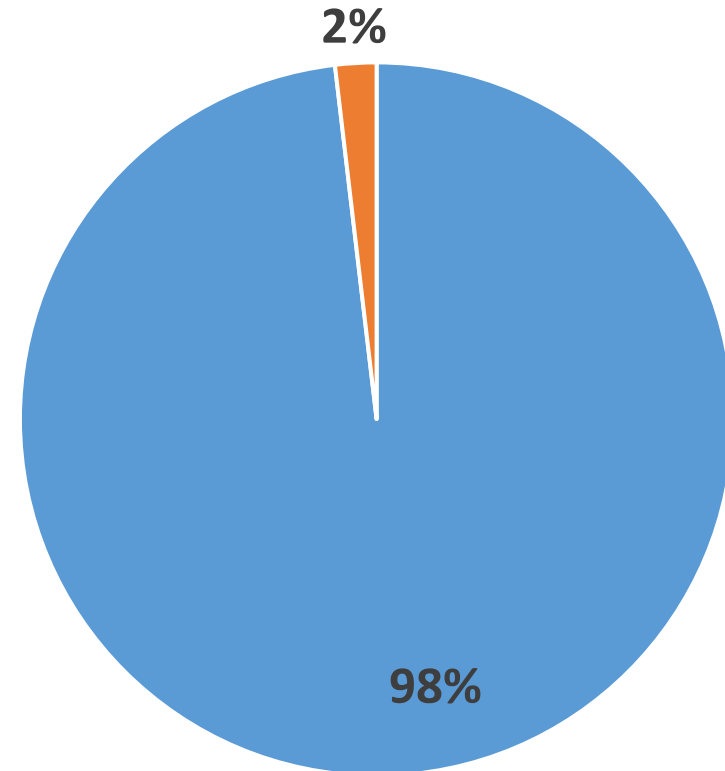
# NOx Emissions from Flares in the Valley

All NOx Emissions in the Valley  
(Mobile, Stationary, & Area Sources)



■ Other NOx Sources ■ Flares

NOx Emissions from Stationary Sources



■ Other Stationary Sources ■ Flares

# San Joaquin Valley Flare Inventory

Category	# Flares
Chemical Production and/or Distribution	6
Gas Plants	11
Landfills (Open)	17
Landfills (Closed)	11
Oil and Gas Production	161
Other	6
Propane Backup System	6
Refinery	7
Wastewater Treatment	22
Agriculture Related Digester	16
Organic Liquid Handling	4
<b>Total</b>	<b>267</b>

# Attainment Plan Commitments to Minimize Flaring

- *2018 PM2.5 Plan* commitments
  - Additional low NO<sub>x</sub> flare emission limitations for existing and new flaring activities at Valley facilities to the extent that such controls are technologically achievable and economically feasible
  - Additional flare minimization requirements to the extent that such controls are technologically achievable and economically feasible
  - Expand applicability of the rule by removing the exemption for non-major sources
  - Plan evaluation estimated 0.05 tpd NO<sub>x</sub> emission reduction through implementation of low NO<sub>x</sub> flare installation requirements
- District staff have conducted comprehensive review of requirements in other air districts, lowest emission limits being achieved in installations statewide, and costs and feasibility of most effective emission control technologies available

# Public Process to Amend Rule 4311

- Scoping Meeting held August 17, 2017
- *2018 Plan for the 1997, 2006, and 2012 PM2.5 Standards*
  - Adopted: November 15, 2018
  - Included updated commitments
- Flare Operator Workgroup Meetings
  - October 2017, April 2019, and July 2019
- Public workshops held November 13, 2019 and July 30, 2020
- Regular updates provided at Citizens Advisory Committee (CAC), Environmental Justice Advisory Group (EJAG), and District Governing Board meetings
- Ongoing opportunities for public input throughout rule development process

# Ultra-low NOx Flare Technology

- District has been conducting extensive evaluation of ultra-low NOx flare technologies for potential use in further reducing emissions under Rule 4311
  - High destruction efficiency of non-methane hydrocarbons (manufacturers guarantee 99%+)
  - Minimizes emissions of NOx (0.024 lb-NOx/MMBtu)
  - Emissions controlled through burner system and precise air/gas mixture in enclosed flare
- Costs, infrastructure requirements, and technological considerations of technology under evaluation
  - Operation with low Btu oilfield gas not proven
  - Increased operation and maintenance requirements
  - Emission control technology not as effective for emergency or short duration releases

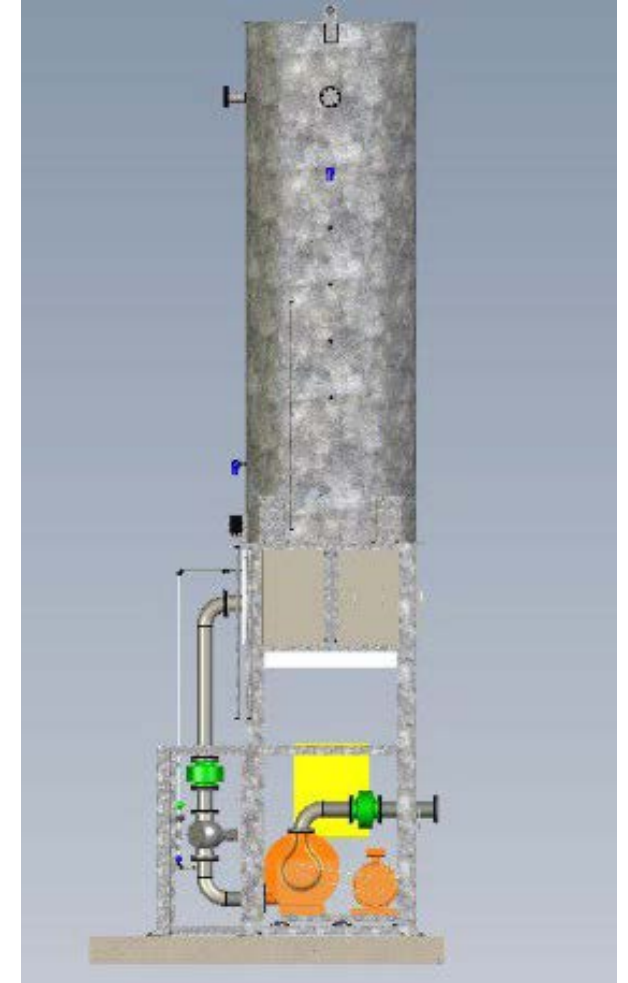


Image Credit: Lfgtech, 2019

# Proposed Rule Concepts

- Remove non-major source exemption
- Remove landfill exemption
- Add performance standard to require ultra-low NO<sub>x</sub> technology for new and existing flares (consistent w/ SCAQMD Rule 1118.1)
  - Oil and Gas Related Flares: 20,000 MMBtu/yr threshold
    - Controls 65% of gas flared
  - Landfill Flares: 90,000 MMBtu/yr threshold
    - Controls 93% of gas flared
  - Digester/Wastewater Treatment Flares: 100,000 MMBtu/yr threshold
    - Controls 77% of the gas flared
- Specific limits proposed depending on applicability of ultra-low NO<sub>x</sub> technology to different flaring processes (industry-specific considerations)
- Ultra-Low NO<sub>x</sub> controls required for flares that exceed the above thresholds



# Proposed Rule Concepts (cont'd)

- Proposed NO<sub>x</sub> limits (consistent with South Coast Rule 1118.1)
  - 0.018 lb-NO<sub>x</sub>/MMBtu limit for flares at oil and gas operations
  - 0.025 lb-NO<sub>x</sub>/MMBtu limit for flares fired on digester gas at major source facilities, and landfill gas
  - 0.06 lb-NO<sub>x</sub>/MMBtu limit for digester gas at non-major source facilities
  - 0.068 lb-NO<sub>x</sub>/MMBtu limit for all other flares
  - 0.25 lb-NO<sub>x</sub>/MMBtu limit for organic liquid storage operations
  - 0.034 lb-NO<sub>x</sub>/1,000 gallons at organic liquid loading operations

# Proposed Rule Concepts (cont'd)

- Operators have until December 31, 2023 to either reduce flaring below specified levels, or to install an ultra-low NOx flare
  - All flare operators required to submit one-time report to District in March, 2021
  - Throughput monitoring for compliance to begin in 2021
  - Operators that exceed throughput thresholds must submit plan to District of how to reduce flaring below specified levels, or submit an Authority to Construct for an ultra-low NOx flare by 2022 deadline

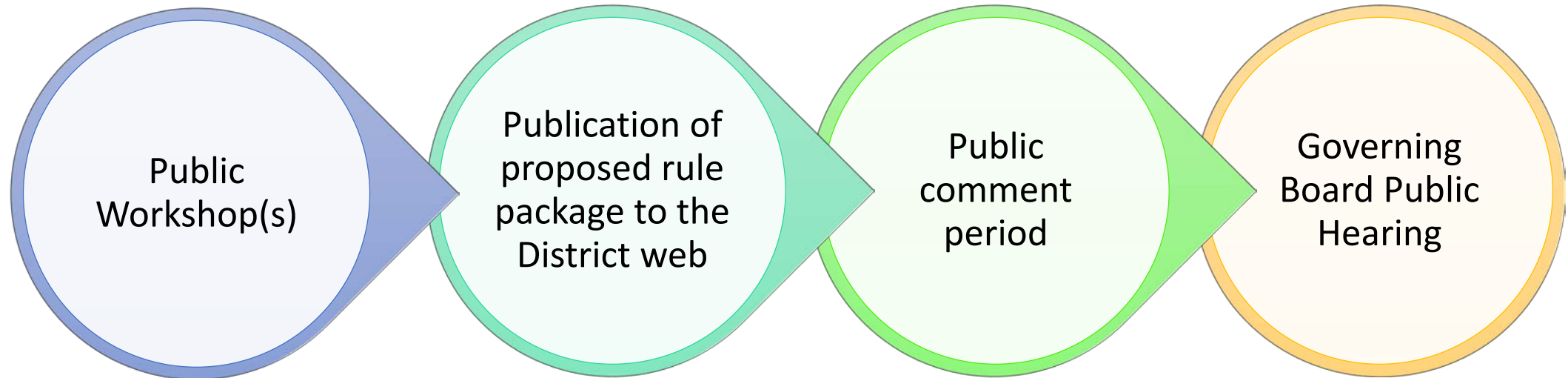
# Proposed Rule Concepts (cont'd)

- Installation of ultra-low NO<sub>x</sub> flare technology would be required for flares that combust majority of gas in Valley
  - Proposed concept would require installation of ultra-low NO<sub>x</sub> flares associated with 65% of total gas flared from all categories
- New ultra-low NO<sub>x</sub> requirements would be in addition to current requirements, including flare minimization plans
- Ultra-low NO<sub>x</sub> requirement exemptions for
  - Units used less than 200 hr/yr @ capacity
  - Various Location Permits
  - Units that burn propane only
  - Landfills that combust less than 2 MMSCF/year and have ceased accepting waste

# Next Steps

- District staff analyzing costs and technological feasibility issues associated with meeting the proposed NOx limits
  - Specific considerations for different industries/types of applications and types/sizes of units
- Socioeconomic Impact Analysis will be conducted to support feasibility analysis
  - Characterize the Valley's economic climate
  - Evaluate economic impacts
  - Prepare Socioeconomic Impact Analysis report
  - Present to Governing Board
- Results of analysis will be included with proposed rule packages

# Next Steps: Public Engagement Process for Flare Rule Amendment Development



Public Participation and Comment Invited throughout Process

# Rule 4311 Contact

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# Open Discussion

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