Presentation Overview

• Air Quality (Ozone), California Clean Air Act
• Regulatory background – Rule 74.15.1
• Emission source background
• Ultra-low NOx burners
• Proposed rule requirements
• Emission reductions and costs
• Summary
California Clean Air Act

• HSC Section 40914
  – Requires 5% or more emission reductions per year or alternative strategy which includes all feasible measures.

• This potential control measure identified as feasible measure based:
  – Implementation in SCAQMD and SJUAPCD
  – Availability of ultra-low NOx burners.

• As a serious nonattainment area, HSC Section 40919 requires the adoption of Best Available Retrofit Control Technology (BARCT)
Regulatory Background

- Adopted 1993: Retrofit Units to 30 ppm NOx at 3%O$_2$
- Revised 1995: New tune-up procedure - natural draft units.
- Revised 2012: NOx limit of 20 ppm for new units between 1 and less than or equal to 2 MMBtu/hr.
- ARB Comments (2012): Retrofit existing units to 12 or 9 ppm NOx (atmospheric or forced draft units, respectively).
- 2012 APCD Cost Analysis for Retrofits ranged from $12 to $1,887 per pound of NOx reduced.
- Committed to revisit rule after 2014.
Boilers, Steam Generators & Process Heaters (1 to 5 MMBtu/hr)

- Types of facilities:
  - Commercial, Fruit Packing, Government, Hospitals, Hotels, Naval Facilities, Oil and Gas Production, Schools, and Factories.
- Permitted NOx emission Inventory about 20 tons/year
- APCD requires permits for all units in this size range including portable LPG-fired oil heaters and asphalt batch plants.
- Portable engines subject to California Portable Equipment Registration Program regulations, but new portable process heaters subject to BACT and APCD permits.
Ultra-low NOx Burners

1) M-PAKT® Ultra Low NOx Burner
2) Pipe train constructed for required codes and authorities
3) MAXON Shut-off Valves
4) Combustion air blower
5) System control panel

A typical air heater incorporating M-PAKT burners
Ultra-low NOx Burners
Proposed Rule Requirements

- **New NOx limits for new or replaced units (natural gas)**
  - $>2$ MMBtu/hr and $<5$ MMBtu/hr:
    - 12 ppm for atmospheric units (fan allowed for premixing fuel)
    - 9 ppm for forced draft fully enclosed units
- **No change to existing 20 ppm NOx limit for new units from 1 to 2 MMBtu/hr.**
- **Clarify deadline for annual screening (1 to 2 MMBtu/hr):**
  - No later than the yearly anniversary of the last source test.
- **Clarify recordkeeping (reports already required):**
  Annual log for screening results, and action taken.
Proposed Rule Requirements (continued)


- Clarify definition of process heater (New list of processes excluded from rule applicability):
  - Dehydrators, Dryers, Crematory, Incinerators, Calciners, Roaster, Furnaces.
  - Afterburners, vapor incinerators, thermal or catalytic oxidizers used as an emission control device.
  - Glass metal furnace and tenter frame, fabric or carpet dryer.

- NOx limits in permit conditions still apply to this excluded equipment.
EPA Comments on Exemptions

- EPA Comments on proposed exemptions in Section C.2 and C.3 based on other district rules
- Section C.2 exemption for new/replaced units fired on landfill gas, biogas, or LPG.
- SCAQMD Rule 1146.1 has NOx limits on existing units:
  - Landfill gas – 25 ppm, Biogas – 15 ppm
- Propose to replace exemption with these limits plus 30 ppm limit for LPG (new/replaced units only).
- Proposed limit for LPG units at 30 ppm based on existing permit conditions.
- Section C.3 exempt portable LPG units from existing 30 ppm limits. Only source (Manhole Adjusters) not meeting this limit is exempt under usage (< 1.8 Billion BTU/year).
NOx Emission Reductions and Cost-Effectiveness

- Ventura County NOx potential emission reductions estimated at 9.3 tons per year from unit replacements.
- Cost-effectiveness is based on the incremental cost of ultra-low NOx burners (assumed $10,000) for new boilers, steam generators and process heaters: $2.30 per lb of NOx reduced.
- SCAQMD NOx sources eligible for RECLAIM, where current credits cost about $2.50 per pound.
Summary

• Significant NOx reductions at 9.4 tons/year
• Required All Feasible Measure by state law for non-attainment areas
• Feasible, reasonable, and cost-effective NOx control measure
• Based on SJUAPCD Rule 4307.
• Clarified deadline for boiler screenings and new recordkeeping requirement.
• Clarified applicability of other gaseous fuels besides natural gas, and definition of process heater.