

# San Juan Generating Station

Emission Controls  
Current and Future

- Four Unit coal fired plant built in 1976 through 1982
- Produces approximately 1800 megawatts of power
- Provides power to meet about 60% of PNM customer needs in New Mexico
- Nine different owners
- Provides power to Arizona, Utah, California and New Mexico

- Coal from BHP Billiton San Juan Mine
- Burns approximately 6.6 million tons of coal annually
- Converted from a surface mine to an underground mine in 1999

# Emissions Controls

## Particulate Matter

- Designed with Electrostatic Precipitators or ESP.
- Removes approximately 99.7 percent of the particulate matter
- Performance exceeds Federal and State Emissions requirements ( 0.1 lbs/mmbtu and 0.05 lbs/mmbtu)

# Emissions Controls

## NO<sub>x</sub>

- Units 1, 3 & 4 designed with Low-NO<sub>x</sub> burners and over-fired air ports.
- Unit 2 designed with over-fired air and combustion controls.
- Meets or exceeds State and Federal emissions requirements. ( 0.70 lbs/mmbtu and 0.45 lbs/mmbtu)

# Emission Controls

## SO<sub>2</sub>

- Originally designed with a Wellman-Lord SO<sub>2</sub> Removal system.
- A regenerative system that removed SO<sub>2</sub> from flue gas and produced either sulfur or sulfuric acid
- A very difficult and expensive process to operate.

# Emission Controls

## SO<sub>2</sub> (continued)

- In 1999 we converted to a limestone based SO<sub>2</sub> removal system.
- Better performance and less expensive to operate.
- Meets or exceeds Federal and State emissions requirements (1.2 lbs/mmBtu and 0.65 lbs)

# Future Emissions Controls

- In 2002 the Grand Canyon Trust and Sierra filed a citizens lawsuit against SJGS for opacity violations. NMED joined the lawsuit.
- Lawsuit was settled in 2004 through a Consent Decree.
- PNM agreed to a number of environmental improvements.

# Future Emissions Controls (continued)

- Improvements will include:
  - New particulate requirements (0.015 lbs/mmbtu)
  - Increased SO<sub>2</sub> removal (90 % removal)
  - Low-NO<sub>x</sub> burners with advanced over-fired air. (0.30 lbs/mmbtu)
  - Mercury removal

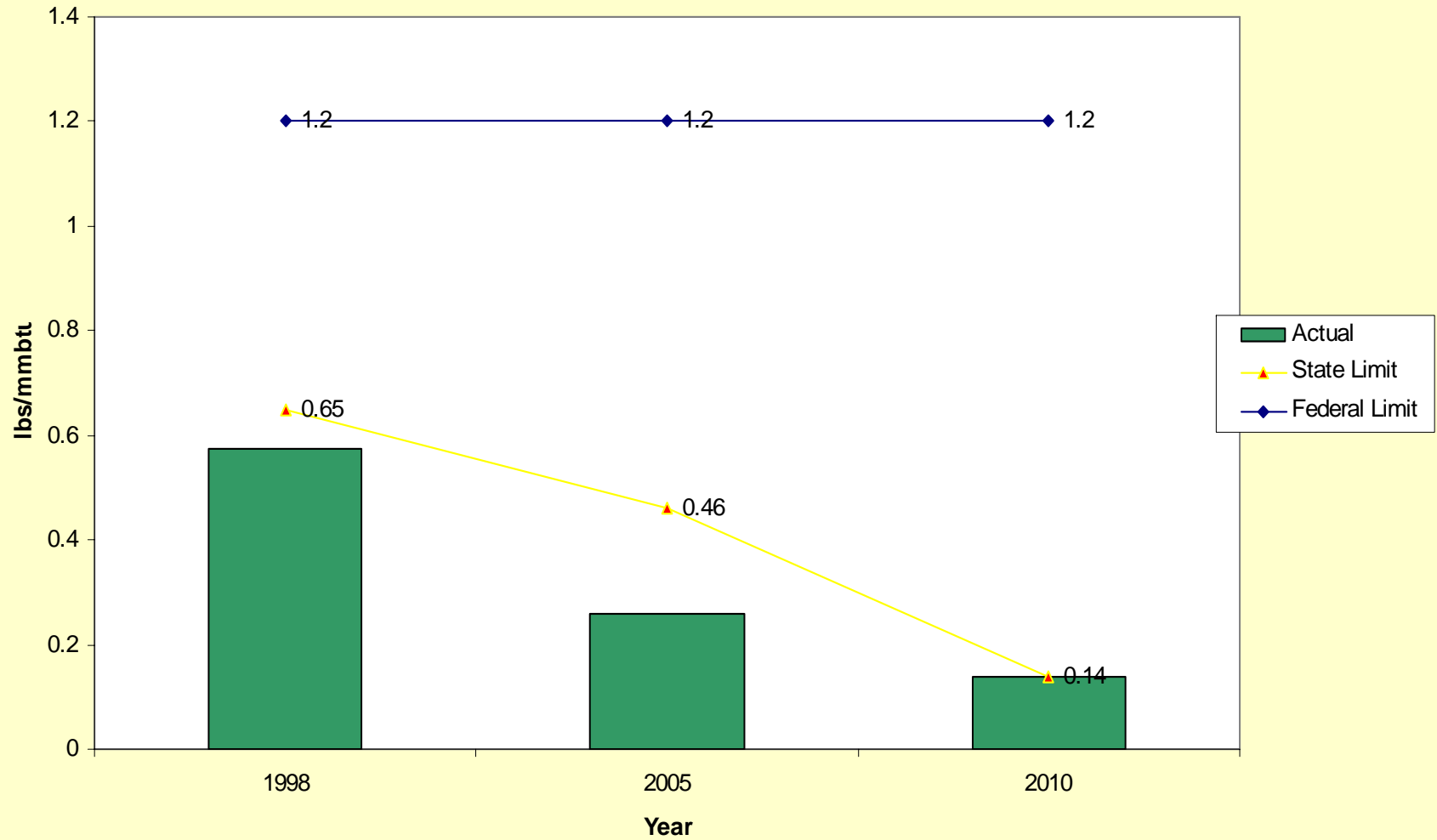
# Schedule for Improvements

- Construction will be completed during major Maintenance Outages
  - Unit #4 – Fall of 2007
  - Unit #3 – Spring of 2008
  - Unit #1 – Fall of 2008
  - Unit #2 – Spring of 2009

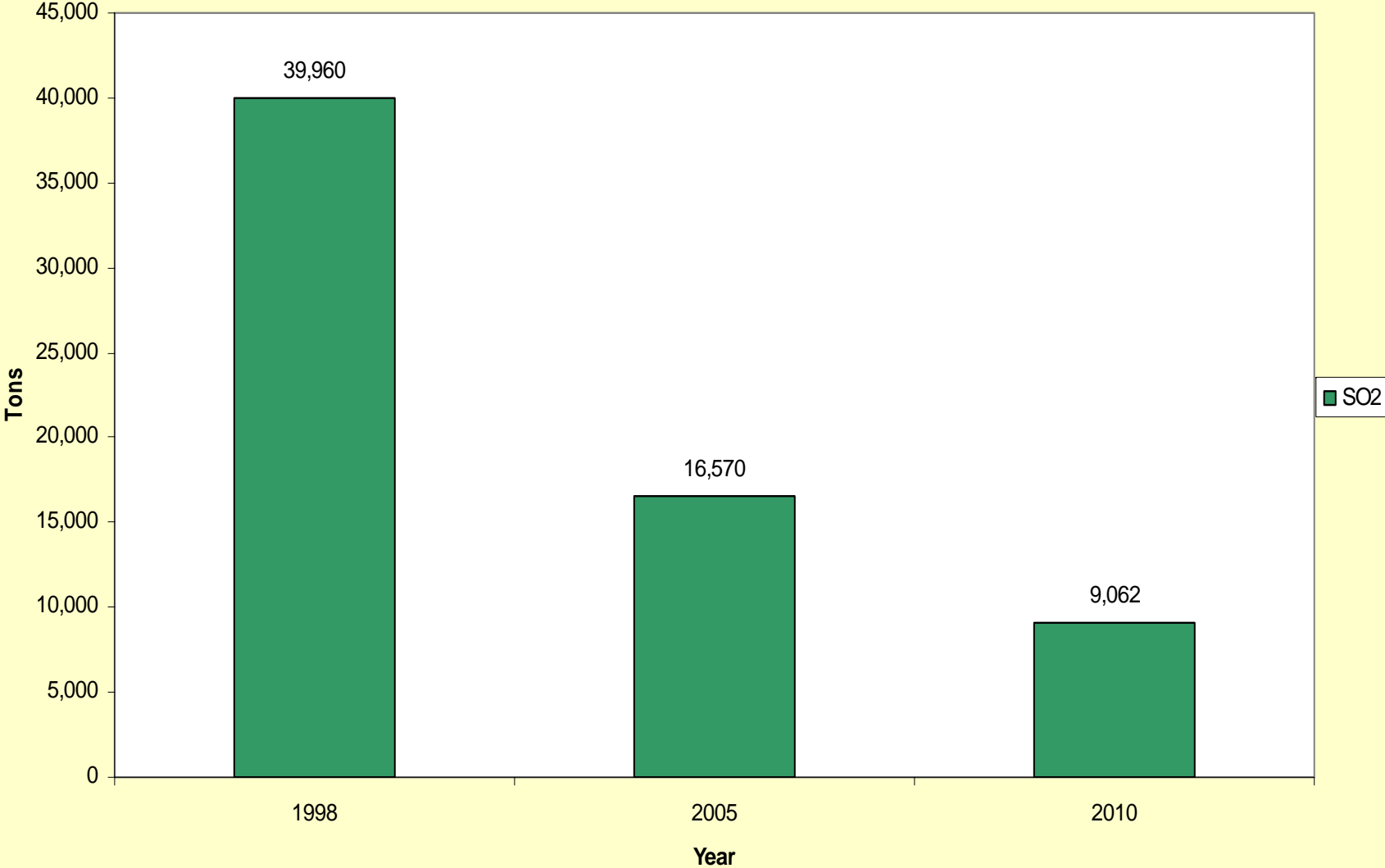
# SO<sub>2</sub> Improvements

- Increase SO<sub>2</sub> removal from current 80 to 84% removal to 90% removal.
- Accomplish by increased scrubbing of flue gas.
- Addition of Dibasic Acid – increases the efficiency of the limestone.

### San Juan Generating Station SO2 Emissions - lbs/mmbtu



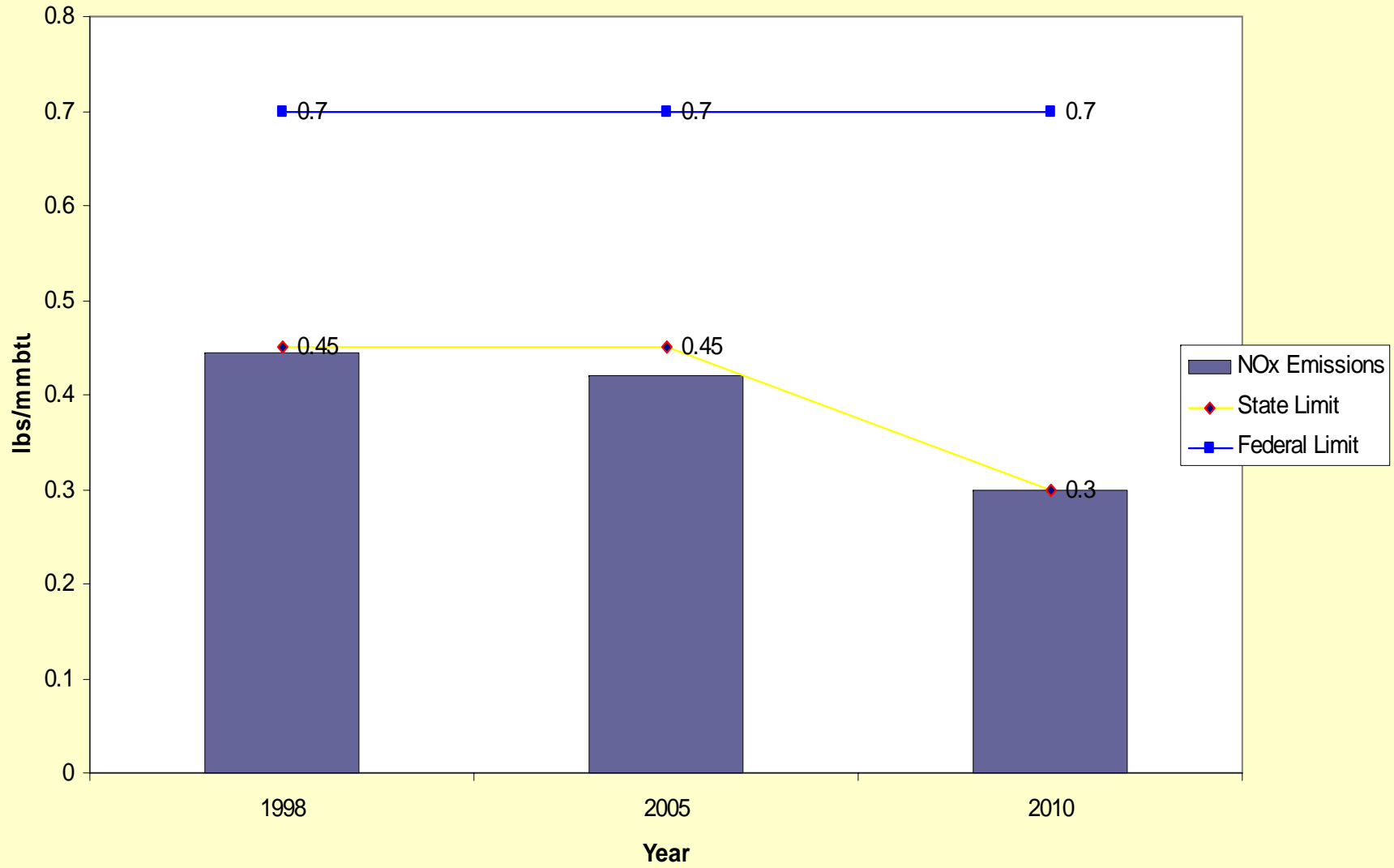
**San Juan Generating Station  
SO2 Emissions - Tons**



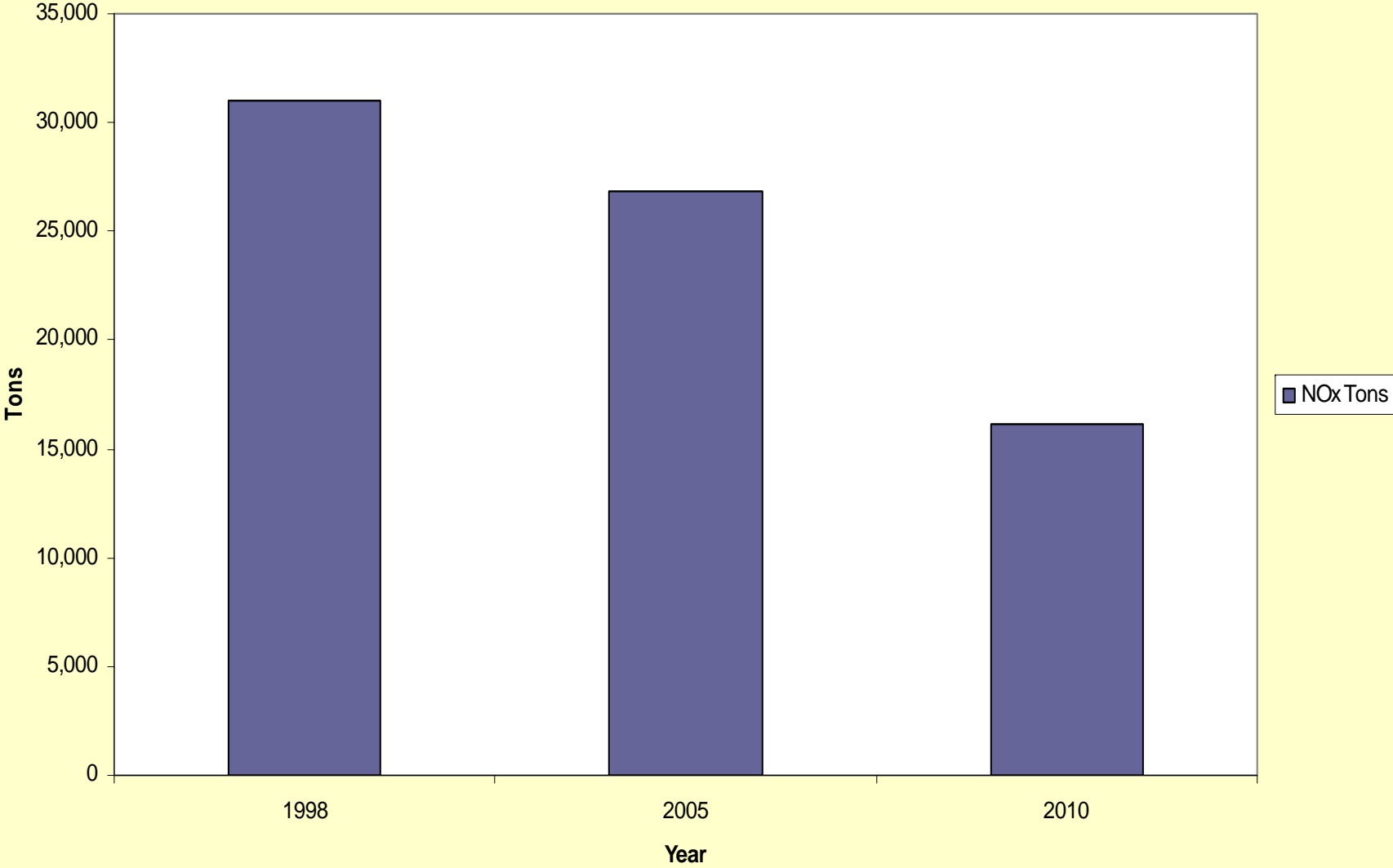
# NOx Improvements

- State of the art Low NOx Burners.
- Advanced over-fired air
- Combustion controls
- Neural net
- New limit will be 0.30 lbs/mmbtu or lower.

### San Juan Generating Station NOx Emissions - lbs/mmbtu



**San Juan Generating Station  
NOx Emissions - Tons**



# Particulate & Mercury Control

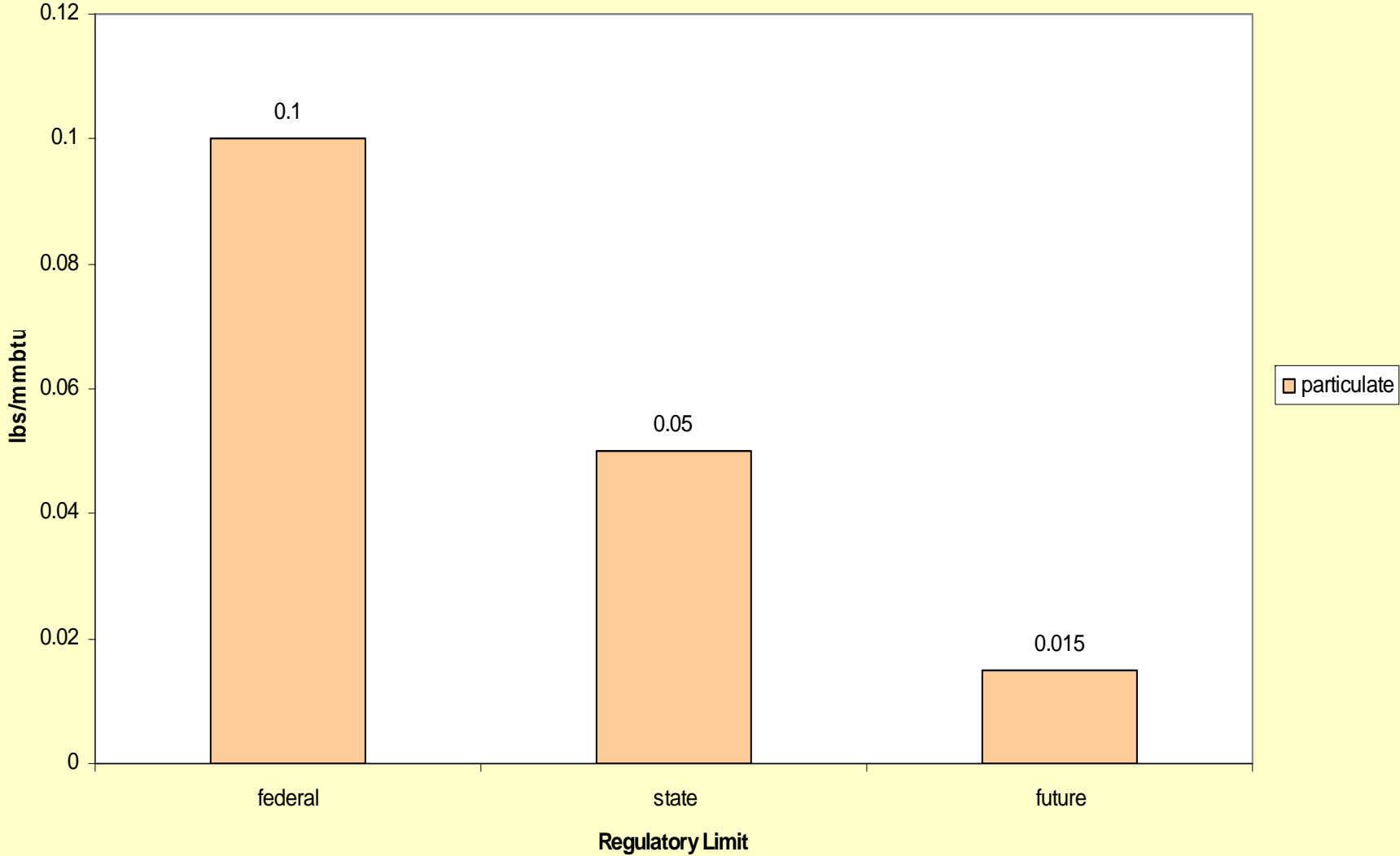
- Installation of full-sized baghouse for Particulate Control.
  - Emissions limit of 0.015 lbs/mmbtu
- Installation of Activated Carbon (AC) Injection system for Mercury Control.
  - Will test different types of AC to maximize removal rate on Units 3 & 4.
  - Test period will be 1 ½ years.

# Particulate & Mercury Control

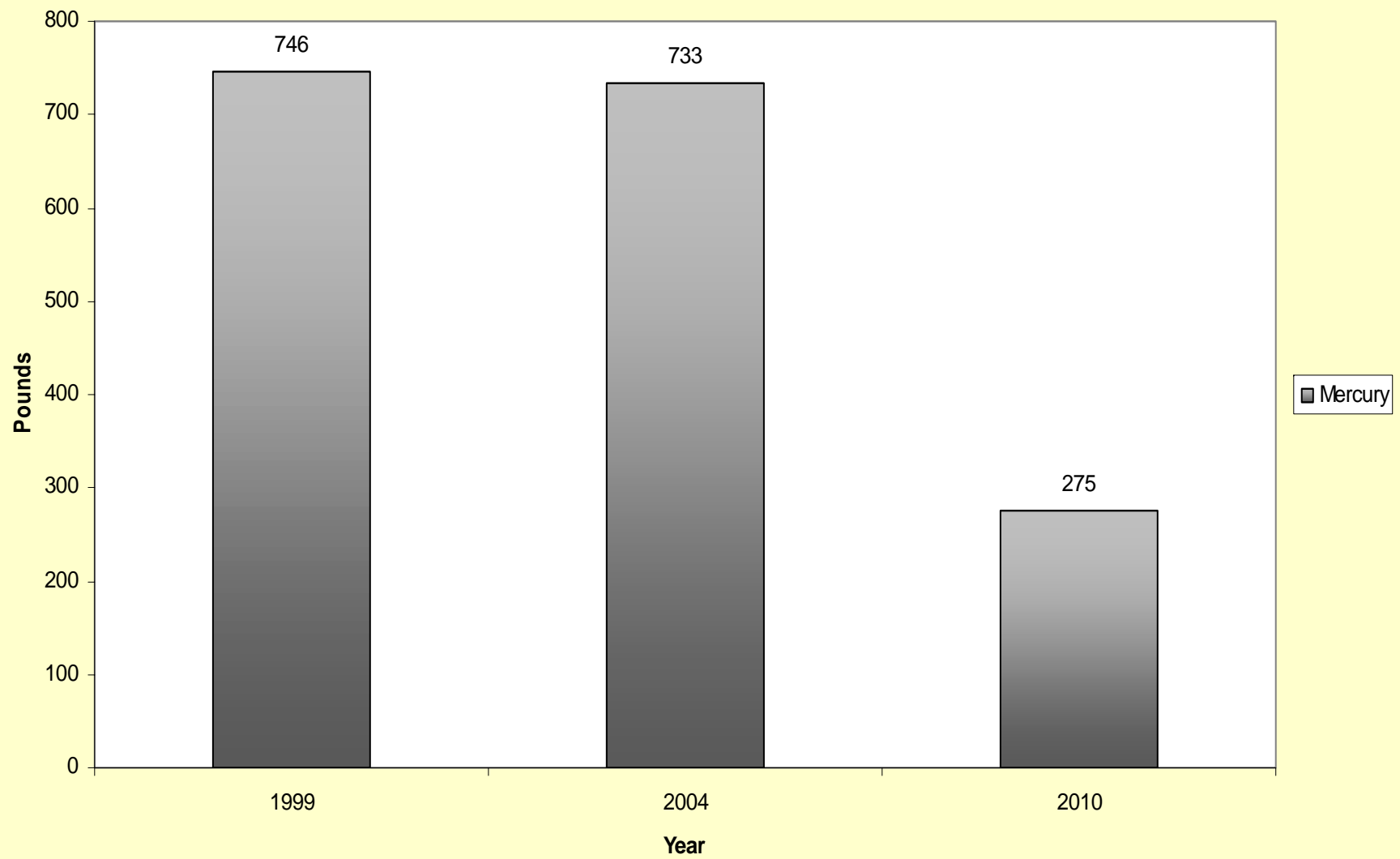
## (continued)

- Includes the installation of Mercury Emissions Monitors.
- Removal technology will be installed and operated on Unit 1 & 2.

# San Juan Generating Station Particulate Emissions



**San Juan Generating Station  
Mercury Emissions - Pounds**



Questions?

Thank-you