# San Juan Generating Station:
# State Implementation Plan for Regional Haze

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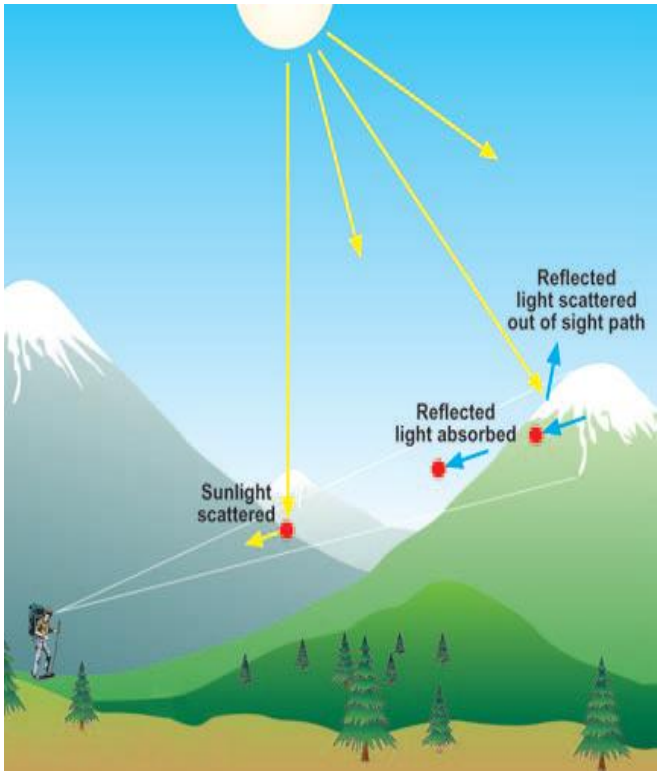
# What is Haze?

- Haze is caused by the scattering and absorption of light by pollution particles in the air that make the background appear hazy.
- Air pollution that causes haze comes from a variety of sources:
  - industrial sources,
  - vehicles, and
  - natural sources (i.e. windblown dust and wildfire soot)
- The EPA uses the deciview (dv) haze index as the indicator for visibility.
  - Like the decibel scale, the dv provides a useful means of expressing changes in visibility.
  - The dv index has a value near zero for a pristine atmosphere. Each dv corresponds to a small but perceptible scenic change.
  - In general, a one dv change is perceptible to the human eye.




From "How Pollution Affects the View," EPA, April 2006

# Regional Haze and San Juan Generating Station

**Regional Haze Rule**

The Clean Air Act sets the goal of returning Class I Areas (national parks and wilderness areas) to natural visibility levels by 2064.

**State Implementation Plan**

States develop plans to limit emissions from major contributors and other sources that contribute to regional haze.

**San Juan Generating Station**

In 2006,the NM Environment Department identified San Juan as a regional haze source based upon emissions, age of plant and proximity to 16 Class I areas.


There are 156 national parks and wilderness areas protected by the Regional Haze Rule. (EPA, http://www.epa.gov/visibility/program.html, 2012

# San Juan Plan to Comply with Regional Haze

In February of 2013, EPA, NMED and PNM reached settlement now formalized in a revised state implementation plan.

EPA approved the state plan on October 9, 2014.

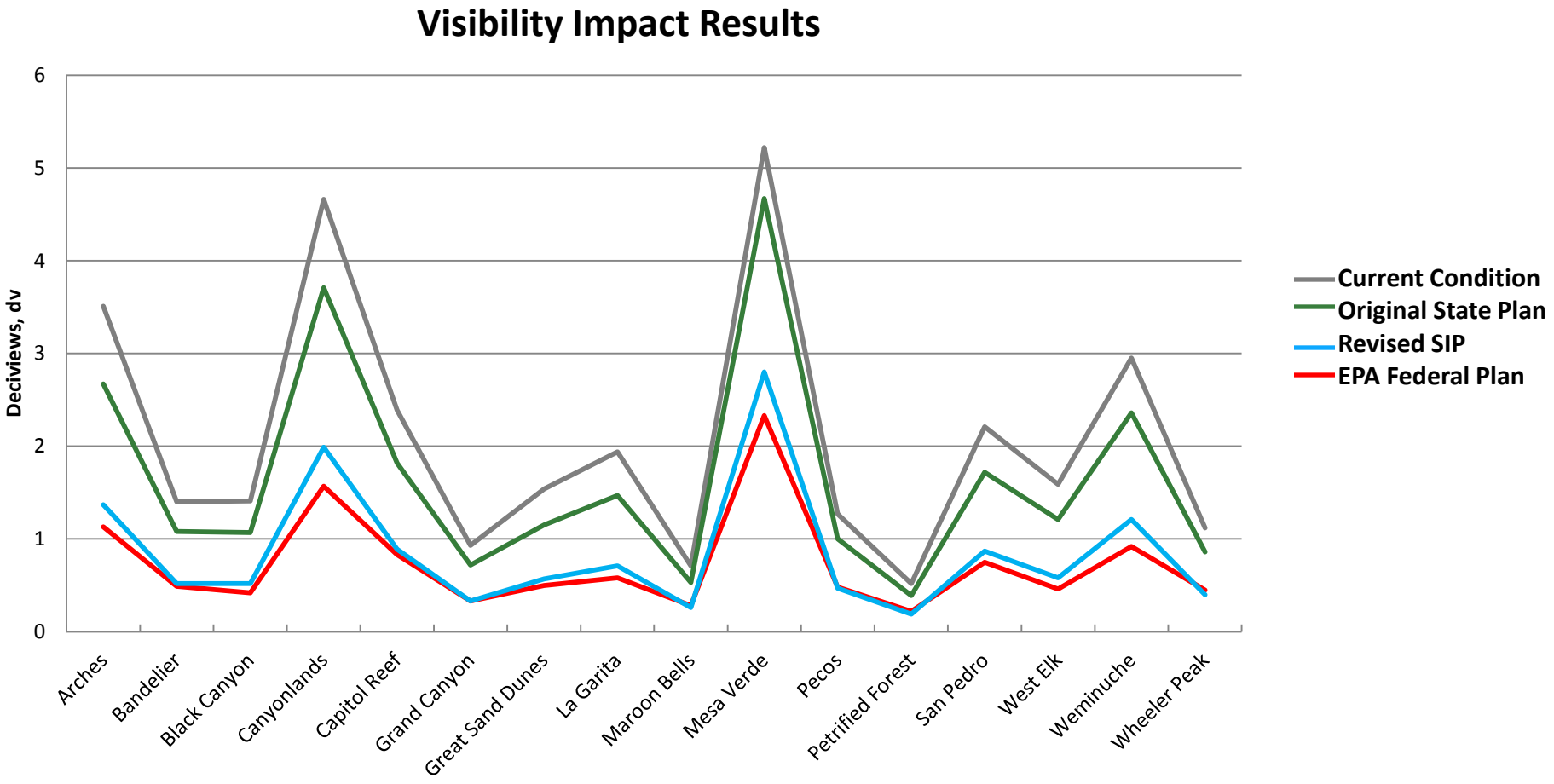
- The agreement includes:
  - Installation of Selective Non-Catalytic Reduction technology for nitrogen oxides (NOx) reduction on Units 1 and 4 by January 2016.
  - Closure of San Juan Units 2 and 3 (836 MW) by December 2017.
- Replacement of the retired capacity includes a mix of resources--additional capacity at San Juan Unit 4 and Palo Verde Unit 3, 40 MW of solar photovoltaic ("PV") generation and a new natural gas-fired peaking plant.
- PNM's plan represents a 30% reduction in coal generation capacity.

# Estimated SJGS Emissions – Percent Reductions Current to Revised SIP

| Scenario | $NO_x$ (tpy) | $SO_2$ (tpy) | PM (tpy) | CO (tpy) | VOC (tpy) | $CO_2$[1] (tpy) | Hg[2] (tpy) |
|---|---|---|---|---|---|---|---|
| Current | 21,000 | 10,500 | 2,380 | 33,507 | 210 | 14,699,968 | 0.0842 |
| State Revised SIP | 8,011 | 3,483 | 1,184 | 18,615 | 104 | 7,314,801 | 0.042 |
| ***State Alt % Reduction from Current*** | ***62%*** | ***67%*** | ***50%*** | ***44%*** | ***50%*** | ***50%*** | ***50%*** |

Note:
[1]$CO_2$ numbers from the 2011 EPA Clean Air Markets Division database based upon 2011 operating data.
[2]Hg numbers based on 1.2 lb/MBtu Mercury and Air Toxics Standard (MATS) Limit.

# Visibility Results Curves




Curves illustrate the visibility impacts at each Class I area for each BART technology scenario.

# Other Environmental Benefits of Regional Haze Plan

- Other Environmental Benefits:
  - Water consumption reduced by about 53%
  - Coal ash generation reduced by about 48%
  - Significant reduction in truck traffic (hauling coal ash back to the mine) and raw material deliveries
  - Visible plumes (four stacks to two stacks)
- Creates a strong pollution control platform to help position San Juan to meet future environmental regulations.

# EPA's Proposed Clean Power Plan

- Goal: Estimated 30% reduction in $CO_2$ emissions from the U.S. electric power sector in 2030, relative to 2005 levels.
- Issued under the authority of section 111(d) of the Clean Air Act (CAA)
- Requires each state to develop and implement a state plan to reduce its $CO_2$ emissions rate to meet state-specific standards based on **2012** average emissions rates for all affected fossil-fueled units in the state.
- Two-phased program:
  - Interim emission rate goal- 2020-2029
  - Final emissions rate goal- 2030 and beyond.

# EPA's Proposed Clean Power Plan

## New Mexico's required reduction from 2012 emissions

- 2020-2029 (interim): 1107 lb $CO_2$/MWh
- 2030 (final): 1048 lb $CO_2$ lbs/MWh

## Standard setting assumptions

- Heat rate improvements at coal and oil generating stations.
- Re-dispatch from coal to natural gas.
- Western states assigned an average RPS of 21%.
- Energy efficiency increases by 1.5% each year between 2020 and 2030.

## Ten facilities in NM affected

- Two coal plants – San Juan and Escalante
- Four natural gas combined cycle plants
- Four oil and gas steam plants

The shutdown of two units at San Juan reduces $CO_2$ emissions from the plant by about 8 M tons/year. This provides a huge step for New Mexico towards compliance with the Clean Power Plan.

# Summary

- With the implementation of the Regional Haze Plan, San Juan will continue to serve as an important resource for PNM and ensure continued diversification of PNM's energy supply.
- The Regional Haze Plan significantly reduces visibility impacts from San Juan and also cuts emissions, water consumption and coal ash generation.
- San Juan's greenhouse gas emissions will be reduced by 50% and provides a significant step for NM towards meeting EPA's proposed Clean Power Plan.