



Sundt Unit 4 BART Tucson Electric Power Co.

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Sundt Unit 4 History

H. Wilson Sundt Generating Station (formerly Irvington Generation Station)

- Four steam boilers – 422 MW
 - Units 1-3 fire natural gas/fuel oil
 - Unit 4 fires coal/natural gas/landfill gas
 - Two gas turbines - 46 MW
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- Units 1-3 commence operation between 1957 and 1962
 - Unit 4 commences operation in 1967 firing fuel oil and natural gas
 - Power Plant and Industrial Fuel Use Act of 1978 requires Unit 4 to convert to coal; Conversion completed in 1988
 - In 1999 Unit 4 begins firing landfill gas from Los Reales Landfill
 - Sundt Station is critical for reliability
 - Import capability
 - Black start



Regional Haze Rule

- **1999 - EPA publishes Regional Haze Rule**
 - Goal of reducing visibility impairment in Class I areas to “natural conditions” by 2064
 - Primary visibility impairing pollutants – SO₂, NO_x, PM
- **2005 – EPA publishes BART Guidelines**
 - Specific requirements for stationary sources built between 1962 and 1977
- **2007 – First Regional Haze SIPs due**
 - Essentially all states miss deadline

Regional Haze and BART in Arizona

- **February 2011 - ADEQ issues Regional Haze SIP for Arizona**
 - Sundt Units 1-3 are not BART eligible due to construction date
 - Sundt Unit 4 not BART eligible because it was “reconstructed” outside of the BART eligibility timeframes
- **August 2013 - EPA issues final rule “disapproving” portions of the Arizona SIP**
 - Sundt Unit 4 is BART eligible
 - TEP commented on proposed disapproval that Sundt Unit 4 should not be BART - eligible
- **November 2013 – TEP submits letter to EPA describing an “alternative to BART”**
 - Alternative requires elimination of coal by 2018
 - Reduce NOx emission rate to 0.25 lbs/MMBtu
- **February 2014 – EPA issues proposed FIP (Phase II) for Arizona**
 - Includes BART determination for Sundt Unit 4 and Alternative to BART
 - EPA cannot require a fuel change as BART

BART for Sundt Unit 4

- **Selective Non-Catalytic Reduction (SNCR) for NO_x emissions**
- **Dry Sorbent Injection (DSI) for SO₂ emissions**
- **Existing Baghouses for PM emissions**
- **Implementation within three years**

Total Annual Cost (\$ x 1000)

	EPA	TEP
SNCR	\$ 1,266	\$ 1,492
DSI	\$ 2,789	\$ 4,668
SCR ¹	\$ 6,017	\$ 9,579

Control Cost Effectiveness (\$/ton)

	EPA	TEP
SNCR	\$ 3,222	\$ 3,637
DSI	\$ 1,857	\$ 3,088
SCR ¹	\$ 5,176	\$ 7,874

1. Selective Catalytic Reduction – Not selected as BART

“better than BART” Alternative

Emission Limits (lbs/MMBtu)

NO _x	SO ₂	PM
0.025	0.00064	0.030

- **40 CFR 51.308(e)(2)**

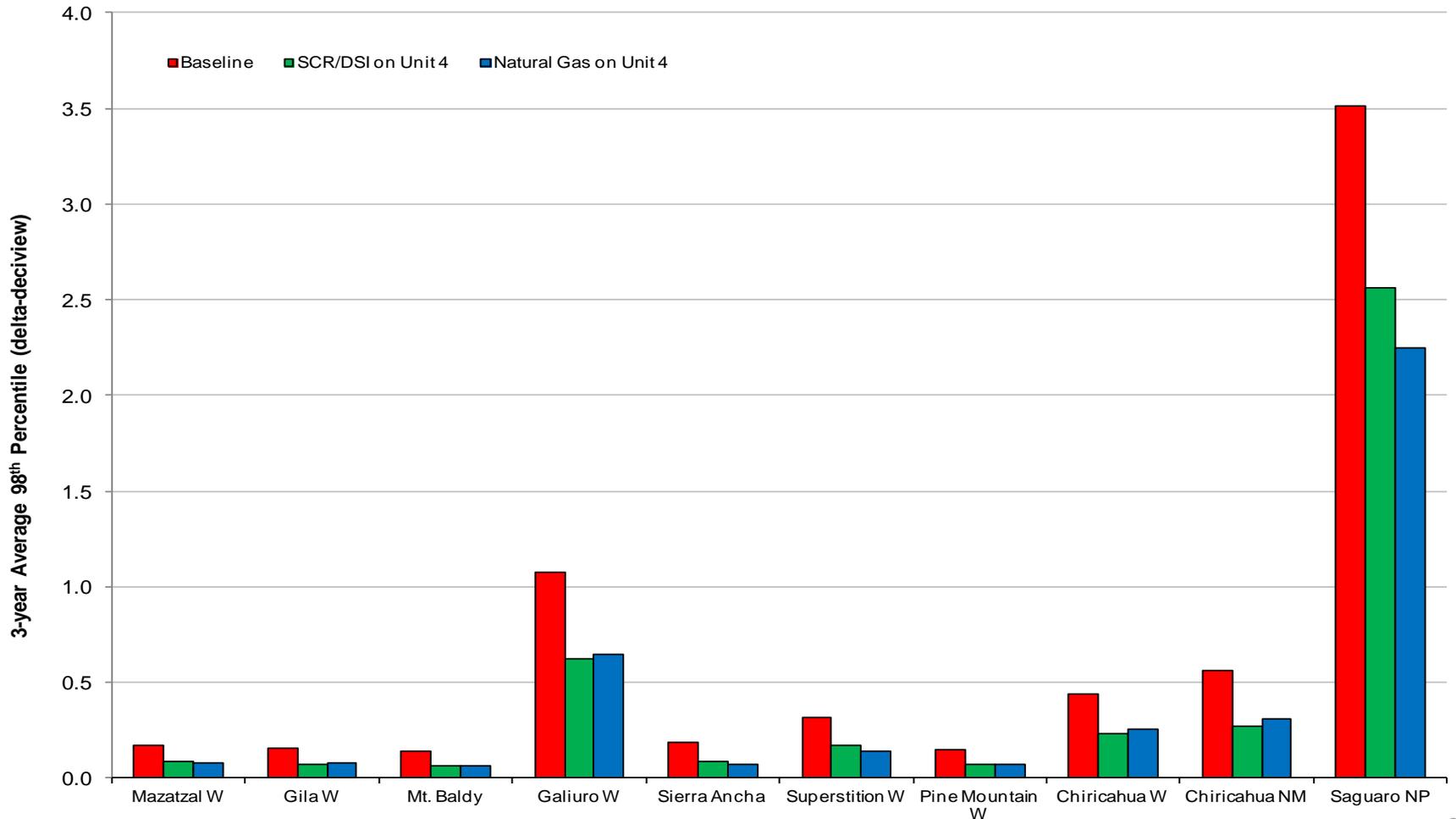
“if the distribution of emissions is not substantially different than under BART, and the alternative measure results in greater emissions reductions, than the alternative measures may be deemed to achieve greater reasonable progress”

Comparison of Annual Emissions (tons per year)

Parameter	BART	Alternative	Delta
NO _x	917	652	265
SO ₂	644	1.9	642
PM	88	30	59

Visibility Benefit

a) CALPUFF Version 5.8 with 1.0 ppb Ammonia Ambient Background



Benefits of BART Alternative

- **No anticipated rate impact on customers**
- **CO₂ from natural gas nearly half of that from coal combustion**
- **Eliminate SO₂ and Mercury**
- **Reduced NOx**
 - addressing ozone attainment for Pima County allowing for future economic growth
- **Continued diversification of generation portfolio**
- **Transition Considerations**
 - Need time to implement operational and mechanical modifications to realize maximum emissions reductions
 - Need time ensure gas supply reliability

Sundt Unit 4 BART Timeline

- **Comments on EPA's proposed FIP due March 31, 2014**
 - **Final EPA FIP due June 27, 2014**
 - **TEP must select BART option July 31, 2015**
 - BART installed by August 2017
- Or
- Elimination of coal by January 2018