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BEFORE THE ARIZONA CORPORATION COMMISSION

TOM FORESE
Chairman
BOB BURNS
Commissioner
DOUG LITTLE
Commissioner
ANDY TOBIN
Commissioner
BOYD DUNN
Commissioner

Arizona Corporation Commission

DOCKETED

JUN 26 2018

DOCKETED BY

IN THE MATTER OF SALT RIVER
PROJECT AGRICULTURAL
IMPROVEMENT AND POWER DISTRICT
- CERTIFICATE OF ENVIRONMENTAL
COMPATIBILITY AUTHORIZING THE
EXPANSION OF ITS SANTAN
GENERATING STATION

DOCKET NO. L-00000B-00-0105-00000

DECISION NO. 76764

ORDER

**COMPLIANCE FILING REGARDING
CONDITIONS 20 & 38 OF THE
CERTIFICATE OF
ENVIRONMENTAL COMPATIBILITY
- SALT RIVER PROJECT
AGRICULTURAL IMPROVEMENT AND
POWER DISTRICT CERTIFICATE OF
ENVIRONMENTAL COMPATIBILITY
AUTHORIZING THE EXPANSION OF
ITS SANTAN GENERATING STATION**

Open Meeting
June 12 & 13, 2018
Phoenix, Arizona

BY THE COMMISSION:

FINDINGS OF FACT

1. Salt River Project Agricultural Improvement and Power District ("SRP") is an agricultural improvement district duly organized and existing under Title 48, Chapter 17, Arizona Revised Statutes, and is a political subdivision of the State of Arizona pursuant to Article 13, Section 7 of the Arizona Constitution.

2. In 2000, SRP applied for a Certificate of Environmental Compatibility ("CEC") authorizing the expansion of its Santan Generating Station. The Santan Plant is located at 1005 South Val Vista Drive, Gilbert, Arizona which is near the intersection of Val Vista Drive and Warner Road in Gilbert, Arizona.

1 3. On May 1, 2001, the Arizona Corporation Commission (“ACC”) granted the CEC for
2 the Santan Plant expansion, subject to 41 conditions, in Decision No. 63611.

3 4. Condition 7 requires SRP to make an annual payment of \$50,000 for a period of 20
4 years, beginning in 2004, to surrounding neighborhoods to maintain landscaping improvements as part
5 of mitigation activities for the plant.

6 5. Condition 20 requires SRP to review and deploy available technologies to reduce the
7 size of the steam plumes from the unit cooling towers.

8 6. Condition 20 also requires that this evaluation be conducted on a continuous basis.

9 7. Condition 38, modified in the Commission’s first 5-year review in Decision No. 72636
10 (October 14, 2011), requires SRP to perform an air emissions assessment of the Santan Plant and to file,
11 every five years, a report listing all improvements which would reduce plant emission and the costs
12 associated with each potential improvement.

13 8. Condition 38 directs Commission Staff to review the report and issue its findings on the
14 report, including an economic feasibility study, to the Commission within 90 days of receipt. The
15 Applicant is further directed to install the improvements within 48 months after an order issued by the
16 Commission identifying the specific air emission controls and directing their installation.

17 9. Condition 39 requires SRP to make an annual payment of \$20,000 to the Arizona
18 Corporation Commission Pipeline Safety Fund.

19 10. The expansion of the Santan Project was completed in 2006. This is SRP’s second filing
20 in compliance with the conditions of the CEC.

21 11. On April 3, 2017, SRP filed its plume abatement review report in compliance with
22 Condition 20, and an air emissions assessment report in compliance with Condition 38 of the Santan
23 Expansion Project CEC.

24 12. SRP is requesting a Commission order stating that no additional plume abatement or air
25 emission controls are required at the Santan Generating Station at this time.

26 13. SRP is also requesting that the Commission revise Condition 39 to clarify whether the
27 annual payment to the pipeline and safety fund will continue indefinitely or would expire with the annual
28 payment made in compliance with Condition 7.

1 14. Santan was originally constructed in the 1970's as a plant with four combustion turbines,
2 totaling approximately 368 MW. Decision No. 63611 approved the Santan Expansion Project with two
3 new units capable of generating 825 MW.

4 15. SRP hired Sargent and Lundy, LLC ("S&L") to conduct the emissions assessment for
5 the Santan Generating Station in order to meet Conditions 20 and 38.

6 16. In compliance with Condition 20, S&L conducted an assessment of current available
7 plume abatement technologies. The assessment compared three abatement options: (1) construction of
8 a new non-plume abated cooling tower; (2) construction of a plume-abated cooling tower; and (3)
9 retrofitting existing cooling towers with plume abatement technology. S&L conducted an economic
10 evaluation of each of the abatement options, assessing associated costs on the basis of the frequency of
11 plume visibility. This analysis is included in Table 3 on page 9 of the S&L Condition 20 Assessment
12 Report. A summary of this evaluation is given in Table 1.

13 **Table 1. Summary of Cooling Tower Abatements Costs**

Plume Abatement Measure	Estimated Costs
New Non-Plume Abated Cooling Tower	\$4.5M
New Plume Abated Cooling Tower	\$9M - \$13.5M
Retrofit Existing Cooling Tower for Plume Abatement	\$10.8M - \$16.2M

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22 17. For the climate in which SGS is located, the Company indicated that the conditions for
23 plume visibility are temperatures below 40 degrees Fahrenheit and relative humidity above 80 percent.
24 S&L claims that the frequency and duration of plumes in the vicinity of the SGS plant is relatively short:
25 for instance in 2015, plume visibility was 15 non-consecutive hours.

26 18. Further, according to S&L's analysis, there are no new advancements in plume-
27 abatement technologies. S&L explained that the formation of plumes is infrequent due to the climate
28 in the vicinity of the plant, and that the costs for plume abatement retrofits are not justified for the

1 relatively short annual duration of plumes. SRP is requesting a Commission order stating that no
2 additional improvements to reduce the air plumes be required at this time.

3 19. In compliance with Condition 38, S&L conducted an emissions reduction assessment
4 for all 6 generating units. Based on their results, S&L concluded that emissions reductions were not
5 required for the expansion project (generating units 5 and 6) because they are newer units, equipped
6 with state-of-the-art emissions controls.

7 20. Further, for the legacy units (generating units 1-4), SO₂, PM₁₀, and VOC emissions
8 were sufficiently low due to upgrades installed in 2001, low-sulfur firing fuels, and good combustion
9 practices. The report identified potential for reductions to nitrogen oxide (“NO_x”) and carbon
10 monoxide (“CO”) emissions.

11 21. The S&L assessment of nitrogen oxide (“NO_x”) control technology identified three
12 control options which are technically feasible today. They are: (1) combustor upgrades; (2) selective
13 catalytic reduction (“SCR”) system; and (3) SCR system and combustor upgrades. As part of the
14 assessment, S&L conducted an economic evaluation for each of the three NO_x control options. The
15 cost-effectiveness was assessed on a dollar-per-ton removed basis. This analysis was included in Table
16 5-7 on Page 38 of the S&L Assessment Report. A summary of the NO_x Control Evaluation of Units
17 1-4 is shown below in Table 2.

18 **Table 2. Summary of NO_x Control Evaluation for Units 1-4⁽¹⁾**

Control Technology	Total Emissions Reduction (tpy)	Total Capital Cost (\$)	Total Annual O&M Cost (\$/year)	Total Annual Costs (\$/year)	Average Cost-Effectiveness (\$/ton)
SCR + Combustor Upgrades	145.4	\$80,824,000	\$2,228,000	\$10,276,000	\$70,651
SCR	145.4	\$57,448,000	\$1,995,000	\$7,715,000	\$53,043
Combustor Upgrades	97	\$23,376,000	\$278,000	\$2,615,000	\$26,968

24 ⁽¹⁾Values presented are combined totals for Santan Generating Station Units 1-4.

25 22. S&L explained in its report that the average cost-effectiveness of the three NO_x control
26 options for Units 1-4 is high, ranging from \$26,968 to \$70,651 per ton. This cost is so high because the
27 total cost of the control technology is significant, but the resulting reduction in emissions is minimal.

1 The reason for this is that the current emissions are extremely low because of the emission control
2 improvements that SRP installed at Santan in the early 2000s and the units' limited use.

3 23. S&L conducted a review of publicly available evaluations of emission control cost-
4 effectiveness. S&L found that it is common for permitting agencies¹ to declare that NO_x options
5 exceeding \$10,000 per ton of NO_x removed are not considered cost-effective. The least-cost of the
6 three options considered for Santan is \$26,968 per ton for the combustor upgrades. This is over two
7 and a half times the cost of the \$10,000 per ton NO_x limit for cost-effectiveness.

8 24. The carbon monoxide ("CO") control technology assessment by S&L listed three
9 technically feasible options. They are: (1) CO catalyst system upgrades; (2) CO catalyst system upgrades
10 and combustor upgrades; and (3) combustor upgrades and existing CO catalyst system. The cost-
11 effectiveness of controls was assessed on a dollar-per-ton removed basis. The summary of the CO
12 Control Evaluation for Units 1-4 was included as Table 5-14 on Page 50 of the S&L Assessment. A
13 summary of the CO Control Evaluation is shown below in Table 3.

14 **Table 3. Summary of CO Control Evaluation for Units 1-4⁽¹⁾**

Control Technology	Total Emissions Reduction (tpy)	Total Capital Cost (\$)	Total Annual O&M Cost (\$/year)	Total Annual Costs (\$/year)	Average Cost-Effectiveness (\$/ton)
CO Catalyst System Upgrades	20.07	\$1,361,000	\$198,000	\$334,000	\$16,639
CO Catalyst System Upgrades and Combustor Upgrades	20.07	\$24,737,000	\$485,000	\$2,949,000	\$146,916
Combustor Upgrades and Existing CO Catalyst System	4.01	\$23,376,000	\$278,000	\$2,615,000	\$651,381

15 ⁽¹⁾Values presented are combined totals for Santan Generating Station Units 1-4.

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23 25. S&L calculates the average annual cost-effectiveness of the three CO control options
24 for Units 1-4 to range from \$16,639 to \$651,381 per ton of CO removed. The cost to remove additional
25 CO is high because the cost of the control technology is substantial and the resulting air emission
26 reductions are minimal. Similar to the case with NO_x controls, the current emissions are extremely low
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28 ¹The permitting agencies and documents used for the analysis are listed in Attachment 8 of the Sargent & Lundy Report.

1 due to the emission control improvements that were made by SRP in the early 2000s and the limited
2 use of the Santan legacy units.

3 26. Permitting agencies often set levels based on which controls are considered cost-
4 effective. S&L conducted a review of publicly available evaluations and S&L concluded that it is
5 common for agencies to consider control options for CO to be “cost prohibitive” at levels above \$4,000
6 per ton of CO removed. Since the three options identified by S&L cost from \$16,639 to \$651,381 per
7 ton of CO removed, S&L concluded that the three options were cost-prohibitive.

8 27. SRP, in its filing, contends that there are additional reasons why no new emission
9 controls should be required. SRP indicates that the Santan Generating Station is currently operating
10 under an air quality operating permit issued by the Maricopa County Air Quality Department
11 (“MCAQD”). This permit includes separate combined emission limits for Units 5A, 5B, and 6. The
12 permit also includes separate combined emission limits for Units 1-4. The permit was issued as part of
13 the Santan Expansion Project.

14 28. S&L claims that, as a result of the installation of emission controls on Units 1-4 and the
15 advanced technology use for Units 5A, 5B and 6, the plant’s capacity was increased by the Santan
16 Expansion Project by 825 MW, but resulted in a decrease in total actual plant emissions. According to
17 S&L, actual emissions of the Santan Generating Station have stayed well below the combined emission
18 limits for all regulated pollutants in the MCAQD permit.

19 29. The NO_x permit limit for Santan is 1,056 tons per year. In 2013-2015, the actual Santan
20 NO_x output ranged from only 115 tons to 162 tons. SRP contends that since actual emissions are well
21 below the permitted limits, there is no need for additional control technology at this time. SRP explains
22 that emissions have already been significantly reduced. In 2000, NO_x from Units 1-4 exceeded 2,000
23 tons. After SRP installed dry low-NO_x burners, the total emissions of NO_x from Units 1-4 averaged
24 134 tons per year over the years 2013-2015.

25 30. SRP contends that after oxidation catalysts were installed on Units 1-4 the CO emissions
26 were also reduced significantly. SRP claims that the reduced emission levels are also partially due to the
27 low capacity factors of Units 1-4.

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1 31. SRP claims that it was unable to conduct an externality analysis because “because of the
2 lack of nationally recognized standards” and as hence, “such an analysis at this time would be highly
3 speculative and not provide accurate information for the Commission to base its decision on.”

4 32. As part of its compliance filing, SRP presented a letter issued by the Santan
5 Neighborhood Committee (“Committee”). The Committee, formed as a condition of the Santan
6 Expansion Project CEC, is comprised of representatives from the Arizona Department of Health
7 Services, Maricopa County Air Quality Department, the Town of Gilbert, adjacent homeowners
8 associations (Cottonwood Crossings, Finley Farms South, Rancho Cimarron, Silverstone Ranch and
9 Western Skies), and other stakeholders.

10 33. The Committee recommends, based on a review of the S&L study, that SRP be relieved
11 of the requirements of CEC Conditions 20, 38, and 39 going forward.

12 34. Upon review of the study completed by S&L, Staff issued a Data Request (“DR”) to
13 ascertain the Santan plant’s historical emissions.

14 35. Based on Staff’s analysis of the data, Staff concurs with S&L and SRP that the current
15 emission controls at Santan are appropriate and that no new control technologies are required at this
16 time.

17 36. Staff notes that the two newest units, Units 5A, 5B, and 6 already contain the best-state-
18 of-the-art controls that would apply for a new plant today. Staff also agrees with S&L and SRP that
19 there is no need for any changes to fuel storage tanks, abrasive blasting equipment, emergency engines,
20 or cooling towers. Finally, Staff agrees that there is no need for upgrades of Units 1-4 because the costs
21 of such upgrades would significantly outweigh any benefits.

22 37. Staff disagrees with SRP’s assertion that there is a “lack of nationally recognized
23 standards” for valuating externalities.

24 38. Staff notes that the study, “*The Hidden Costs of Energy²*,”² conducted by the National
25 Research Council, monetized externalities from pollutants, specifically Particulate Matter, Sulfur dioxide,
26 Nitrous Oxides as well as greenhouse gases (GHGs) for the different types of power plants. The
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28 ² National Research Council. 2010. *Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/12794>.

1 valuation was based on an average cost of damages associated with all three pollutants for every unit of
2 energy produced (\$/kWh).

3 39. According to the study, the mean damage due to pollutants (Particulate Matter, Sulfur
4 dioxide, Nitrous Oxides) from gas-fired plants was \$0.16/kWh, weighted by the amount of electricity
5 produced.

6 40. Staff acknowledges that, while this study is a first step in monetizing externalities from
7 pollutants, it does not possess the level of granularity upon which to conduct a monetized assessment
8 of damage averted due to pollution controls.

9 41. Due to this limitation, Staff recommends that the company be granted a waiver of this
10 requirement at this time.

11 42. Furthermore, in recognition of historic average annual emissions from the plant
12 compared to permit limits, as well as support for decreased regulatory oversight from the local
13 community, Staff is not opposed, if SRP so requests, to a less frequent compliance schedule under
14 Condition No. 38 which would ease the regulatory burden on SRP.

15 43. Finally, Staff notes that the Company’s request that the termination date for Condition
16 39 be tied to Condition 7 is not unreasonable. Staff recommends that the termination date for both
17 Conditions be concurrent, terminating in 2020. Alternatively, Staff proposes a termination date of 2025,
18 an extension of five years from the termination date for Condition 7.

19 CONCLUSIONS OF LAW

20 1. The Commission has jurisdiction over Salt River Project and the subject matter
21 contained herein pursuant to A.R.S. §§ 40-252 and 40-360 *et. seq.*

22 2. Notice of the proceeding has been provided in the manner prescribed by law.

23 3. The Commission, having reviewed and considered the application and Staff’s
24 Memorandum dated August 4, 2017, concludes that is in the public interest to approve the Salt River
25 Project compliance filing and modify Decision No. 63611 Condition 39 as specified in this order.

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ORDER

IT IS THEREFORE ORDERED that Salt River Project Agricultural Improvement and Power District shall not be required to install any improvements at the Santan Generating facility at this time.

IT IS FURTHER ORDERED that Salt River Project Agricultural Improvement and Power District's request for a waiver of the requirement of Decision No. 72636 to incorporate the monetized value of all externalities that would be eliminated due to new emissions controls that are being evaluated as part of SRP's Condition 38 compliance analysis is granted with respect to SRP's 2017 compliance filing.

IT IS FURTHER ORDERED that Decision No. 63611 is hereby modified to revise Condition No. 39 of the Certificate of Environmental Compatibility to state as follows:

Applicant shall annually provide \$20,000 to the Pipeline Safety Revolving Fund until 2020, thus improving the overall safety of pipelines throughout the State of Arizona.

IT IS FURTHER ORDERED that Decision No. 72636 is hereby modified to revise Condition No. 38 of the Certificate of Environmental Compatibility to state as follows:

Beginning upon commercial operation of the new units, Applicant shall conduct a review of the Santan Generating facility operations and equipment every 10 years and shall, within 120 days of completing such review, file with the Commission and all parties in this docket, a report listing all improvements which would reduce plant emission and the costs associated with each potential improvement. Commission Staff shall review the report and issue its findings on the report, which will include an economic feasibility study, to the Commission within 90 days of receipt. Applicant shall install said improvements within 48 months after an order issued by the Commission identifying the specific air emission controls and directing their installation. In the event that new controls or a new operating methodology are required, the in-service date of any new control technology or operating methodology will be the starting date for the next 10-year review period. If no new operating methodology is required, the starting date for

1 the next 10-year review period shall be the effective date of the Commission's decision
2 regarding the previous 10-year review report.

3 IT IS FURTHER ORDERED that all other provisions of Decision No. 63611, as amended by
4 Decision No. 72636, remain in full force and effect.

5 IT IS FURTHER ORDERED that this Decision become effective immediately.

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7 **BY THE ORDER OF THE ARIZONA CORPORATION COMMISSION**

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CHAIRMAN FORESE


COMMISSIONER DUNN

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COMMISSIONER TOBIN


COMMISSIONER OLSON

EXCUSED
COMM. BURNS

COMMISSIONER BURNS



14 IN WITNESS WHEREOF, I, TED VOGT, Executive Director
15 of the Arizona Corporation Commission, have hereunto, set my
16 hand and caused the official seal of this Commission to be
17 affixed at the Capitol, in the City of Phoenix, this 26th day
18 of JUNE, 2018.

19 
TED VOGT
EXECUTIVE DIRECTOR

21 DISSENT: _____

23 DISSENT: _____

24 EOA:CCE:nr/CHH

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