

DOCKETED

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Powering The Center of What's Possible

DONALD VON RAESFELD POWER PLANT

2020 3rd Quarter Air Quality Report

Submitted to:

California Energy Commission



July, August, September 2020 – 3rd Quarter Quarterly Compliance Report

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Section I

AQ-14 The Owner/Operator shall not operate the units such that the combined heat input rate to each power train consisting of a Gas Turbine and its associated HRSG (S-1 & S-2 and S-3 & S-4) exceeds 610.6 MM BTU (HHV) per hour, averaged over any rolling 3-hour period. (BACT and Cumulative Increase)

Verification: A detailed report of fuel use and equipment operation shall be included in the Quarterly Air Quality Report required by the verification of Condition **AQ-34**.

AQ-20 The Owner/Operator shall ensure that the Gas Turbines (S-1 & S-3) and HRSGs (S-2 & S-4) comply with requirements (a) through (i) under all operating scenarios, including duct burner firing mode and power augmentation mode. Requirements (a) through (i) do not apply during a gas turbine start-up or shutdown. (BACT and Toxic Risk Management Policy)

- (c) The carbon monoxide emission concentration at P-1 and P-2 each shall not exceed 4.0 ppmv, on a dry basis, corrected to 15% O₂, averaged over any rolling 3-hour period. (BACT for CO)
- (d) Carbon monoxide mass emissions at P-1 and P-2 each shall not exceed 5.47 pounds per hour, averaged over any rolling 3-hour period.
- (e) Ammonia (NH₃) emission concentrations at P-1 and P-2 each shall not exceed 10 ppmv, on a dry basis, corrected to 15% O₂, averaged over any rolling 3-hour period. This ammonia emission concentration shall be verified by the continuous recording of the ammonia injection rate to A-1 and A-3 SCR Systems. The correlation between the gas turbine and HRSG heat input rates, A-1 and A-3 SCR System ammonia injection rates, and corresponding ammonia emission concentration at emission points P-1 and P-2 shall be determined in accordance with Condition AQ-30. (Toxic Risk Management Policy for NH₃)
- (f) Precursor organic compound (POC) mass emissions (as CH₄) at P-1 and P-2 each shall not exceed 2.0 ppmv, on a dry basis, corrected to 15% O₂, averaged over any rolling 3-hour period. (BACT for POC)

AQ-27 The Owner/Operator shall demonstrate compliance with Conditions **AQ-14** through **AQ-17**, **AQ-20(a)** through **AQ-20(d)**, **AQ-21**, **AQ-22(a)**, **AQ-22(b)**, **AQ-23(a)**, and **AQ-23(b)** by using properly operated and maintained continuous monitors (during all hours of operation including equipment Start-up and Shutdown periods) for all of the following parameters:

- (a) Firing Hours and Fuel Flow Rates for each of the following sources: S-1 & S-2 combined, S-3 & S-4 combined.
- (b) Oxygen (O₂) concentration, nitrogen oxides (NO_x) concentration, and carbon monoxide (CO) concentration at each of the following exhaust points: P-1 and P-2.
- (c) Ammonia injection rate at A-1 and A-3 SCR Systems
- (d) Any transient load conditions recorded in **AQ-27(a)** above and as described in **AQ-20(j)** shall be fully characterized and recorded on a quarter hour (15-minute

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period) basis.

The Owner/Operator shall record all of the above parameters every 15 minutes (excluding normal calibration periods) and shall summarize all of the above parameters for each clock hour. For each calendar day, the Owner/Operator shall calculate and record the total firing hours, the average hourly fuel flow rates, and pollutant emission concentrations.

The Owner/Operator shall use the parameters measured above and District-approved calculation methods to calculate the following parameters:

- (e) Heat Input Rate for each of the following sources: S-1 & S-2 combined and S-3 & S-4 combined.
- (f) Corrected NO_x concentration, NO_x mass emission rate (as NO₂), corrected CO concentration, and CO mass emission rate at each of the following exhaust points: P-1 and P-2.

For each source, source grouping, or exhaust point, the Owner/Operator shall record the parameters specified in Conditions **AQ-27(e)** and **AQ-27(f)** at least once every 15 minutes (excluding normal calibration periods). As specified below, the Owner/Operator shall calculate and record the following data:

- (g) Total Heat Input Rate for every clock hour and the average hourly Heat Input Rate for every rolling 3-hour period.

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JULY 2020

Heat input rate, CO concentration and mass emissions, Ammonia concentration, POC mass emissions.



Section I CT1 - July
2020.pdf



Section I CT2 - July
2020.pdf

AUGUST 2020

Heat input rate, CO concentration and mass emissions, Ammonia concentration, POC mass emissions.



Section I CT1 -
August 2020.pdf



Section I CT2 -
August 2020.pdf

SEPTEMBER 2020

Heat input rate, CO concentration and mass emissions, Ammonia concentration, POC mass emissions.

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Section I CT1 -
September 2020.pdf



Section I CT2 -
September 2020.pdf

Section II

AQ-15 The Owner/Operator shall not operate the units such that the combined heat input rate to each power train consisting of a Gas Turbine and its associated HRSG (S-1 & S-2 and S-3 & S-4) exceeds 13,559.2 MM BTU (HHV) per calendar day. (BACT and Cumulative Increase)

Verification: A detailed report of fuel use and equipment operation shall be included in the Quarterly Air Quality Report required by the verification of Condition **AQ-34**.

AQ-22 The Owner/Operator shall not allow total combined emissions from the Gas Turbines and HRSGs (S-1 & S-2 and S-3 & S-4) including emissions generated during Gas Turbine startups and shutdowns and transient excursions to exceed the following limits during any calendar day:

- (a) 358.9 pounds of NO_x (as NO₂) per day
- (b) 377.9 pounds of CO per day
- (c) 71.9 pounds of POC (as CH₄) per day
- (d) 197.8 pounds of PM₁₀ per day
- (e) 18.2 pounds of SO₂ per day

Verification: The project Owner/Operator shall submit documentation of compliance with all emission limits specified in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of Condition **AQ-34**.

AQ-24 The Owner/Operator shall not allow the combined heat input rate to the Gas Turbines and HRSGs (S-1 & S-2 and S-3 & S-4) to exceed 27,118.4 MMBTU per calendar day.

Verification: A detailed report of fuel use and equipment operation shall be included in the Quarterly Air Quality Report required by the verification of Condition **AQ-34**.

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JULY 2020 through SEPTEMBER 2020

Unit heat input, mass emissions and combine heat daily totals.



Section II - July
2020 thru Septembe

Section III

AQ-16 The Owner/Operator shall not operate the units such that the combined

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cumulative heat input rate for the Gas Turbines (S-1 & S-3) and the HRSGs (S-2 & S-4) exceeds 8,682,544 MM BTU (HHV) per year. (Offsets and Cumulative Increase)

Verification: A detailed report of fuel use and equipment operation shall be included in the Quarterly Air Quality Report required by the verification of Condition **AQ-34**.

AQ-23 The Owner/Operator shall not allow cumulative combined emissions from the Gas Turbines and HRSGs (S-1 & S-2 and S-3 & S-4) including emissions generated during Gas Turbine startups and shutdowns and transient excursions to exceed the following limits during any consecutive 12month period:

- (a) 43.3 tons of NO_x (as NO₂) per year
- (b) 48.4 tons of CO per year
- (c) 11.2 tons of POC (as CH₄) per year
- (d) 28.1 tons of PM₁₀ per year
- (e) 2.93 tons of SO₂ per year (Offsets and Cumulative Increase)

Verification: The project Owner/Operator shall submit documentation of compliance with all emission limits specified in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of Condition **AQ-34**.

AQ-10 The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM₁₀, and sulfur dioxide that are emitted by the Gas Turbines (S-1 & S-2) and Heat Recovery Steam Generators (S-2 & S-4) during the commissioning period shall accrue towards the consecutive 12-month emission limitations specified in Condition **AQ-23**.

Verification: The project Owner/Operator shall submit documentation of compliance with this Condition of Certification in the Monthly Emissions Report required by Condition **AQ-11**.

AQ-25 The Owner/Operator shall not allow the cumulative heat input rate to the Gas Turbines and HRSGs (S-1, S-2, S-3, S-4) combined to exceed 8,682,544.0 MMBTU per year.

Verification: A detailed report of fuel use and equipment operation shall be included in the Quarterly Air Quality Report required by the verification of Condition **AQ-34**.

(double click each icon to open the data)

OCTOBER 2019 through SEPTEMBER 2020

Combined cumulative heat input and mass emissions yearly totals.



Section III - October
2019 thru Septembe

July, August, September 2020 – 3rd Quarter Quarterly Compliance Report

Section IV

AQ-20 The Owner/Operator shall ensure that the Gas Turbines (S-1 & S3) and HRSGs (S-2 & S-4) comply with requirements (a) through (i) under all operating scenarios, including duct burner firing mode and power augmentation mode. Requirements (a) through (i) do not apply during a gas turbine start-up or shutdown. (BACT and Toxic Risk Management Policy)

- (a) The nitrogen oxide (NO_x) emission concentration at emission points P1 and P-2 each shall not exceed 2.0 ppmv, on a dry basis, corrected to 15% O₂, averaged over any 1-hour period. (BACT for NO_x)
- (b) Nitrogen oxide mass emissions (calculated as NO₂) at P-1 (the combined exhaust point for S-1 Gas Turbine and S-2 HRSG after abatement by A-1 SCR System) shall not exceed 4.49 pounds per hour. Nitrogen oxide mass emissions (calculated as NO₂) at P-2 (the combined exhaust point for S-3 Gas Turbine and S-4 HRSG after abatement by A-3 SCR System) shall not exceed 4.49 pounds per hour. (BACT for NO_x)
- (g) Precursor organic compound (POC) mass emissions (as CH₄) at P-1 and P-2 each shall not exceed 1.56 pounds per hour or 0.00255 lb/MM BTU of natural gas fired. (BACT for POC)
- (h) Sulfur dioxide (SO₂) mass emissions at P-1 and P-2 each shall not exceed 0.41 pounds per hour or 0.000676 lb/MM BTU of natural gas fired. (BACT for SO₂)
- (i) Particulate matter (PM₁₀) mass emissions at P-1 and P-2 each shall not exceed 3.0 pounds per hour when the HRSG duct burners are not in operation. Particulate matter (PM₁₀) mass emissions at P-1 and P-2 each shall not exceed 4.3 pounds per hour when HRSG duct burners are in operation. (BACT for PM₁₀)

AQ-27 The Owner/Operator shall demonstrate compliance with Conditions **AQ-14** through **AQ-17**, **AQ-20(a)** through **AQ-20(d)**, **AQ-21**, **AQ-22(a)**, **AQ-22(b)**, **AQ-23(a)**, and **AQ-23(b)** by using properly operated and maintained continuous monitors (during all hours of operation including equipment Start-up and Shutdown periods) for all of the following parameters:

- (a) Firing Hours and Fuel Flow Rates for each of the following sources: S-1 & S-2 combined, S-3 & S-4 combined.
- (b) Oxygen (O₂) concentration, nitrogen oxides (NO_x) concentration, and carbon monoxide (CO) concentration at each of the following exhaust points: P-1 and P-2.
- (c) Ammonia injection rate at A-1 and A-3 SCR Systems
- (d) Any transient load conditions recorded in **AQ-27(a)** above and as described in **AQ-20(j)** shall be fully characterized and recorded on a quarter hour (15-minute period) basis.

The Owner/Operator shall record all of the above parameters every 15 minutes (excluding normal calibration periods) and shall summarize all of the above parameters for each clock hour. For each calendar day, the Owner/Operator shall calculate and

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record the total firing hours, the average hourly fuel flow rates, and pollutant emission concentrations.

The Owner/Operator shall use the parameters measured above and District-approved calculation methods to calculate the following parameters:

- (e) Heat Input Rate for each of the following sources: S-1 & S-2 combined and S-3 & S-4 combined.
- (f) Corrected NO_x concentration, NO_x mass emission rate (as NO₂), corrected CO concentration, and CO mass emission rate at each of the following exhaust points: P-1 and P-2.

For each source, source grouping, or exhaust point, the Owner/Operator shall record the parameters specified in Conditions **AQ-27(e)** and **AQ-27(f)** at least once every 15 minutes (excluding normal calibration periods). As specified below, the Owner/Operator shall calculate and record the following data:

- (g) Total Heat Input Rate for every clock hour and the average hourly Heat Input Rate for every rolling 3-hour period.
- (i) The average NO_x mass emission rate (as NO₂) and corrected NO_x emission concentration for every clock hour and for every quarter hour (15-minute) period.
- (j) The average CO mass emission rate and corrected CO emission concentration for every clock hour and for every rolling 3-hour period.
- (l) For each calendar day, the average hourly Heat Input Rates, Corrected NO_x emission concentration, NO_x mass emission rate (as NO₂), corrected CO emission concentration, and CO mass emission rate for each Gas Turbine and associated HRSG combined
(Regulation 1-520.1, 9-9-501, BACT, NSPS, Cumulative Increase)

Verification: The project Owner/Operator shall submit documentation of each of the parameters specified in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of Condition AQ-34.

(Double click each icon to open the data)

JULY 2020

NO_x concentration and NO_x mass emissions, POC, SO₂, PM₁₀ mass emissions, heat input, CO concentration and mass emissions – 1 hour averages



Section IV CT1 - July
2020.pdf



Section IV CT2 - July
2020.pdf

AUGUST 2020

NO_x concentration and NO_x mass emissions, POC, SO₂, PM₁₀ mass emissions, heat input, CO concentration and mass emissions – 1 hour averages

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Section IV CT1 -
August 2020.pdf



Section IV CT2 -
August 2020.pdf

SEPTEMBER 2020

NO_x concentration and NO_x mass emissions, POC, SO₂, PM₁₀ mass emissions, heat input, CO concentration and mass emissions – 1 hour averages



Section IV CT1 -
September 2020.pdf



Section IV CT2 -
September 2020.pdf

Section V

AQ-20 The Owner/Operator shall ensure that the Gas Turbines (S-1 & S3) and HRSGs (S-2 & S-4) comply with requirements (a) through (i) under all operating scenarios, including duct burner firing mode and power augmentation mode. Requirements (a) through (i) do not apply during a gas turbine start-up or shutdown. (BACT and Toxic Risk Management Policy)

- (j) Compliance with the hourly NO_x emission limitations specified in Condition **AQ-20(a)** and **AQ-20(b)**, at both P1 and P2, shall not be required during short-term excursions, limited to a cumulative total of 160 hours per rolling 12 month period. Short-term excursions are defined as 15-minute periods designated by the Owner/Operator that are the direct result of transient load conditions, not to exceed four consecutive 15-minute periods, when the 15-minute average NO_x concentration exceeds 2.0 ppmv, dry @ 15% O₂. Examples of transient load conditions include, but are not limited to the following:
- (1) Initiation/shutdown of combustion turbine inlet air cooling
 - (2) Initiation/shutdown of combustion turbine water mist or steam injection for power augmentation
 - (3) Rapid combustion turbine load changes
 - (4) Initiation/shutdown of HRSG duct burners
 - (5) Provision of Ancillary Services and Automatic Generation Control at the direction of the California Independent System Operator (Cal-ISO)

The maximum 1-hour average NO_x concentration for short-term excursions at P1 and P-2 each shall not exceed 5 ppmv, dry @ 15 percent O₂ or 11.2 lb/hr (2.80 lb per 15 minute period). All emissions during short-term excursions shall be included in all calculations of hourly, daily and annual mass emission rates as required by this permit.

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Verification: The project Owner/Operator shall submit documentation of compliance with all emission limits specified in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of Condition **AQ-34**.

(double click each icon to open the data)

JULY 2020 through SEPTEMBER 2020 NOx short term excursions

No short term NOx excursions during 3Q2020

Section VI

AQ-21 The Owner/Operator shall ensure that the regulated air pollutant mass emission rates from each of the Gas Turbines (S-1 & S-3) during a startup or a shutdown does not exceed the respective limits established below.

	Start-Up (lb/startup)	Shutdown (lb/startup)
Oxides of Nitrogen (as NO ₂)	41	8
Carbon Monoxide (CO)	35	10
Precursor Organic Compounds (as CH ₄)	2	1
Particulate Matter (PM ₁₀)	3	3

Verification: The project Owner/Operator shall submit documentation of compliance with the emission limits in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of Condition **AQ-34**.

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JULY 2020 through SEPTEMBER 2020 Startup and Shutdown mass emissions



Section VI CT1 - July
2020 thru Septembe



Section VI CT2 - July
2020 thru Septembe

Section VII

AQ-27 The Owner/Operator shall demonstrate compliance with Conditions **AQ-14** through **AQ-17**, **AQ-20(a)** through **AQ-20(d)**, **AQ-21**, **AQ-22(a)**, **AQ22(b)**, **AQ-23(a)**, and **AQ-23(b)** by using properly operated and maintained continuous monitors (during all hours of operation including equipment Start-up and Shutdown periods) for all of the following parameters:

(a) Firing Hours and Fuel Flow Rates for each of the following sources: S-1 & S-2 combined, S-3 & S-4 combined.

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The Owner/Operator shall record all of the above parameters every 15 minutes (excluding normal calibration periods) and shall summarize all of the above parameters for each clock hour. For each calendar day, the Owner/Operator shall calculate and record the total firing hours, the average hourly fuel flow rates, and pollutant emission concentrations.

The Owner/Operator shall use the parameters measured above and District-approved calculation methods to calculate the following parameters:

- (e) Heat Input Rate for each of the following sources: S-1 & S-2 combined and S-3 & S-4 combined.
- (f) Corrected NO_x concentration, NO_x mass emission rate (as NO₂), corrected CO concentration, and CO mass emission rate at each of the following exhaust points: P-1 and P-2.

For each source, source grouping, or exhaust point, the Owner/Operator shall record the parameters specified in Conditions **AQ-27(e)** and **AQ-27(f)** at least once every 15 minutes (excluding normal calibration periods). As specified below, the Owner/Operator shall calculate and record the following data:

- (h) On an hourly basis, the cumulative total Heat Input Rate for each calendar day for the following: each Gas Turbine and associated HRSG combined and all four sources (S-1, S-2, S-3, and S-4) combined.
- (k) On an hourly basis, the cumulative total NO_x mass emissions (as NO₂) and the cumulative total CO mass emissions, for each calendar day for each Gas Turbine and associated HRSG combined, and all four sources (S-1, S-2, S-3, and S-4) combined.
- (m) On a daily basis, the cumulative total NO_x mass emissions (as NO₂) and cumulative total CO mass emissions, for the previous consecutive twelve month period for all four sources (S-1, S-2, S-3, and S-4) combined.

(Regulation 1-520.1, 9-9-501, BACT, NSPS, Cumulative Increase)

Verification: The project Owner/Operator shall submit documentation of each of the parameters specified in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of Condition **AQ-34**.

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JULY 2020 through SEPTEMBER 2020 Combined Daily Firing Hours



Section VII 27 (a) -
July 2020 thru Octob

JULY 2020 Cumulative total Heat Input Rate

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Section VII 27 (h) -
July 2020.pdf

Cumulative NOx and CO mass emissions – daily



Section VII 27 (k) -
July 2020.pdf

AUGUST 2020

Cumulative total Heat Input Rate



Section VII 27 (h) -
August 2020.pdf

Cumulative NOx and CO mass emissions – daily



Section VII 27 (k) -
August 2020.pdf

SEPTEMBER 2020

Cumulative total Heat Input Rate



Section VII 27 (h) -
September 2020.pdf

Cumulative NOx and CO mass emissions – daily



Section VII 27 (k) -
September 2020.pdf

OCTOBER 2019 through SEPTEMBER 2020

Cumulative NOx and CO mass emissions – consecutive 12 months



Section VII 27 (m) -
October 2019 thru S

Section VIII

AQ-28 To demonstrate compliance with Conditions **AQ-20(f)**, **AQ-20(g)**, **AQ-20(h)**, **AQ-20(i)**, **AQ-21**, **AQ-22(c)** through **AQ-22(e)**, and **AQ-23(c)** through **AQ-23(e)**, the

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Owner/Operator shall calculate and record on a daily basis, the Precursor Organic Compound (POC) mass emissions, Fine Particulate Matter (PM₁₀) mass emissions (including condensable particulate matter), and Sulfur Dioxide (SO₂) mass emissions from each power train. The Owner/Operator shall use the actual Heat Input Rates calculated pursuant to Condition **AQ-27**, actual Gas Turbine Start-up Times, actual Gas Turbine Shutdown Times, and CEC and District-approved emission factors to calculate these emissions. The calculated emissions shall be presented as follows:

- (a) For each calendar day, POC, PM₁₀, and SO₂ emissions shall be summarized for: each power train (Gas Turbine and its respective HRSG combined) and all four sources (S-1, S-2, S-3, and S-4) combined.
- (b) On a daily basis, the cumulative total POC, PM₁₀, and SO₂ mass emissions, for each year for all four sources (S-1, S-2, S-3, and S-4) combined.

(Offsets, Cumulative Increase)

Verification: The project Owner/Operator shall submit documentation of each of the parameters specified in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of Condition **AQ-34**.

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JULY 2020 through SEPTEMBER 2020 **POC, PM₁₀, SO₂ mass emissions – daily**



Section VIII - July
2020 thru Septembe

OCTOBER 2019 through SEPTEMBER 2020 **POC, PM₁₀, SO₂ mass emissions – daily cumulative totals**



Section VIII -
October 2019 thru S

Section IX

AQ-34 The Owner/Operator of the Pico Power Plant shall submit all reports (including, but not limited to monthly CEM reports, monitor breakdown reports, emission excess reports, equipment breakdown reports, etc.) as required by District Rules or Regulations and in accordance with all procedures and time limits specified in the District Rule, Regulation, Manual of Procedures, or Enforcement Division Policies & Procedures Manual. (Regulation 2-6-502)

Verification: The project Owner/Operator shall submit a Quarterly Air Quality Report (QAQR) for the preceding calendar quarter by January 30, April 30, July 30 and October 30 of each year. Each QAQR shall include, but not be limited to, a compliance matrix, a summary of operations activities, and a summary of all reports covered by this

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Condition. The January 30 report for each year shall include an annual summary of the four Quarterly Air Quality Reports covering the preceding calendar year. The QAQR shall be submitted to the California Energy Commission Compliance Project Manager (CPM).

(Double click the icon to open the data)

JULY 2020 through SEPTEMBER 2020 Monthly CEMS Reports to the BAAQMD



JULY 2020 through SEPTEMBER 2020 Episode Reports to the BAAQMD

No episode reports during 3Q2020

Section X

AQ-45 The owner/Operator shall take monthly samples of the natural gas combusted at the Donald Von Raesfeld Power Plant. The samples shall be analyzed for sulfur content using District-approved laboratory methods. The sulfur content test results shall be retained on site for a minimum of five years from the test date and shall be utilized to satisfy the requirements of 40 CFR Part 60, subpart GG.

Verification: The project Owner/Operator shall submit documentation of compliance with this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of Condition **AQ-34**.

Exempt from verification due to using PUC-regulated low sulfur Natural Gas.

https://www.pge.com/pipeline/operations/sulfur/sulfur_info_values/index.page

Section XI

AQ-34 The Owner/Operator of the Pico Power Plant shall submit all reports (including, but not limited to monthly CEM reports, monitor breakdown reports, emission excess reports, equipment breakdown reports, etc.) as required by District Rules or Regulations and in accordance with all procedures and time limits specified in the District Rule, Regulation, Manual of Procedures, or Enforcement Division Policies & Procedures Manual. (Regulation 2-6-502)

Verification: The project Owner/Operator shall submit a Quarterly Air Quality Report (QAQR) for the preceding calendar quarter by January 30, April 30, July 30 and October 30 of each year. Each QAQR shall include, but not be limited to, a compliance matrix, a summary of operations activities, and a summary of all reports covered by this

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Condition. The January 30 report for each year shall include an annual summary of the four Quarterly Air Quality Reports covering the preceding calendar year. The QAQR shall be submitted to the California Energy Commission Compliance Project Manager (CPM).

(Double click the icon to open the data)

Status of Condition of Certification Matrix



Section XI - AQ
Compliance Matrix for