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Technical Support Document
Coolidge Power, LLC
Permit # V20635.000

1. PROPOSED PERMIT REVISIONS; TECHNICAL AND REGULATORY SUMMARY 2

2. CONCLUSION AND PROPOSED ACTION 4

SUPPLEMENTAL Technical Support Document
Coolidge Power, LLC
Permit # V20635.000
May 8, 2009

This technical support document (TSD Supplement #1) supplements the information presented in the original TSD ("CoolidgePower.tsd4" dated 3/27/09) ("3/27/09 TSD"). This TSD Supplement #1 explains the justifications for certain revisions to the draft permit V 20635.000 (3/27/09). The revised permit, characterized as a "proposed final permit," is identified as V20635.000 (5/1/09).

1. PROPOSED PERMIT REVISIONS; TECHNICAL AND REGULATORY SUMMARY

A. The Requirement for PM_{10} Testing During Turbine Startup

For background, see 3/27/09 TSD ¶9 and ¶10.C.2.

During the public comment period, the applicant raised objection to the 3/27/09 ¶6.A.2 requirement for testing during startup, pointing out that the brief duration of the startup operation did not allow for invocation of any appropriate EPA reference method.

PCAQCD observed that the primary objective of the permit requirement was to verify PM_{10} emissions as projected for purposes of an increment consumption analysis.

However, as discussed below, the applicant has presented such an analysis, based on an assumption that PM_{10} emissions during startup were the same as PM_{10} emissions during steady-state operation.

It appears that prevailing wisdom accepts that partial load PM_{10} emissions are less than steady-state emission rates. See South Coast Air Quality Management District App. No. 383045 "Application Processing and Calculations," (*../document/indigo_App_B_SCAQMD_permit.pdf*) page 12: "[T]the PM10 and SOx emissions are not significantly reduced by operation of the CO catalyst or the SCR, <u>and emissions of these pollutants are less during partial load periods than during normal full load operation</u>." (Emphasis added.)

The applicant has additionally confirmed that: the turbine manufacturer (GE) also indicates that start-up PM_{10} emissions will be lower than full-load; and that the SCR system does not operate during start-up and will therefore also not contribute to start-up PM_{10} emissions. See Jason Schulz e-mail (5/7/2009 3:30 p.m.).

Since startup involves a gradual increase in loading up to a full-load condition, PM_{10} emissions during startup would therefore also logically be <u>less</u> than during full-load operation.

The applicant has conservatively characterized PM_{10} emissions during startup. The increment consumption analysis discussed below still shows that the maximum allowable increase will not be violated. The only reason for PM_{10} startup testing was to assure questions regarding the PM_{10} increment were addressed in a competent and robust fashion. PCAQCD therefore concurs in the deleting the 3/27/09 Draft ¶6.A.2 requirement for performance testing to quantify PM_{10} emissions during the startup phase of turbine operations.

B. The Requirement to Obtain Offsets or Otherwise Further Address PM_{10} Increment Consumption

For background, see 3/27/09 TSD ¶9.

The initial permit review indicated that when operated maximum load conditions, the proposed facility could potentially cause PM_{10} ambient impacts exceeding the "significance level" that would trigger an increment consumption analysis under the EPA's prevailing new source review guidance. That projected impact level was based on PM_{10} emission rates provided by the turbine manufacturer.

The 3/27/09 draft permit ("3/27/09 Draft") accordingly proposed that the permittee, prior to actually operating at those maximum production rates, invoke one of three options to assure that the "maximum allowable increase" would not be exceeded. See 3/27/09 Draft ¶4.D. The first option allowed for a paving project to reduce off-site roadway emissions to the extent required to offset the facility-specific impact such that the net impact was below the "significance" level. The second option allowed for development of some other offset reduction to achieve a similar reduction in net PM_{10} impact. And the third option allowed for the permittee to conduct an increment consumption analysis to show that despite the impact from this facility, the "maximum allowable increase" was still not being exceeded.

Even prior to the issuance of the permit, the applicant has provided an increment consumption analysis. See *Coolidge Generating Station 24-Hour PM_{10} Increment Analysis* (CH2MHILL, April, 2009).

As explained by the applicant, that analysis posited 24-hour PM_{10} emissions based on the operational cycle that had been invoked to generate worst-case impacts when modeling CO and NO_x. Specifically, that operational cycle involved 16 start-and-stop cycles *for all 12 turbines*, coupled with steady-state operation *for each* for the remainder of the 24-hour period. Those start-and-stop cycles spanned about 7 hours, or 29% of the 24-hour period. The analysis also assumed that PM_{10} emissions during the startup phase were the same as the steady-state PM_{10} emissions. As discussed above, that constitutes a conservative characterization of PM_{10} emissions.

Under those conditions, the worst-case impacts from this facility standing alone, and worst-case aggregate impacts both coincidentally reached about 20 µg./m^3, or about 66% of the 30 µg./m^3 PM_{10} increment. See Code §2-5-160.

Since the permit will still require testing to verify the maximum steady-state PM_{10} emissions, PCAQCD concurs in the applicant's request to accept the increment consumption analysis and correspondingly delete 3/27/09 Draft ¶4.D, requiring further attention to the PM_{10} increment issue.

C. The applicant questioned the clarity of the language of 3/27/09 Draft ¶6.D.4, regarding the need to re-state prior CEMs-based quantification of emissions based on CEMs calibration corrections required as a result of RATA testing. Specifically, the applicant felt that CEMs calibration corrections should only be applied on a <u>prospective</u> basis.

In response, PCAQCD noted the need for the operator to show continuous compliance with the cap on emissions. Accordingly, unless some means exists to define when the CEMs began to under-report emissions, the CEMs calibration corrections should also be applied on an <u>retrospective</u> basis all the way back to the last RATA calibration.

In discussing a preliminary version of the following langauge, Mr. Shulz expressed concern over the clarity of the language and the objective. Accordingly, ¶6.D.4 has been revised to read:

> *The "reference period" shall consist of the time between successive RATA tests.*

If RATA testing establishes that actual emission rates, as shown by reference method testing, exceed the emission rates reported by the CEMS for the preceding reference period, then permittee shall apply a "bias adjustment factor" to the data acquisition system such that future reported emissions reflect the newly re-calibrated CEMS. In addition, the permittee shall recalculate the previously logged monthly emissions for each full month during the reference period by applying the same bias adjustment factor.

In addition, to clearly state the impact of that requirement *and to further respond to Mr. Schulz' concerns over clarity*, ¶6.C.1 has been renumbered and revised to include a new sub-¶ b., which reads:

b. To the extent the application of the bias adjustment factor as determined under ¶6.D.4 results in an increase of emissions during the reference period since the previous RATA test, by the 10th of the month following the completion of the latest RATA test, permittee shall correspondingly demonstrate continued continuous compliance during the reference period with the 245 ton per year synthetic minor limit, by recalculating the 12 month rolling average of emissions for each prior month affected by application of the bias adjustment factor.

Based on further research of historical RATA test data, the Applicant has concluded that a "look-back" adjustment is appropriate. As an alternative to applying the full adjustment based upon the latest RATA test to the "reference period," the Applicant has also suggested a modified "look back" bias adjustment, calculating by taking the average of the difference between the previous and the latest RATA calibration values. Applying such an average would accommodate the seeming likelihood that the CEMs calibration would have wandered over time, rather than having that calibration-deviation having occurred in a step-wise fashion on the day after the last RATA test. See Jason Schulz e-mail (5/7/2009 3:30 p.m.).

Nonetheless, a permittee's obligation is to demonstrate continuous compliance. In the absence of some discernable fact to justify time-apportionment or other reduction in a bias adjustment factor, PCAQCD finds that the full upward adjustment should be applied to correct previously calculated emissions for each of the full calendar months in the reference period.

D. The applicant asked that the performance testing cycles in ¶6.A.4.c and ¶6.D.2.d, be harmonized at a 15-month testing cycle. However, 40 CFR Part 75 requires a 14-month maximum testing cycle, so that period has been applied for harmonization purposes.

E. For clarity, the phrase "of operation" has been added to ¶6.D.2.f.

2. CONCLUSION AND PROPOSED ACTION

Based on the information supplied by the applicant, analyses conducted by the PCAQCD it is determined that the proposed project will not cause or contribute to a violation of any federal ambient air quality standards. Therefore, PCAQCD intends to issue to the applicant a unitary permit, including both approval to construct/modify pursuant to CAA Title I, and authority to operate, pursuant to CAA Title V, subject to the conditions set forth in the accompanying proposed final permit.