



June 15, 2023

Illinois Pollution Control Board
60 E Van Buren St., Ste 630
Chicago Illinois 60605

Re: T5@Chicago II, LP
Variance Determination Request
Source I.D. No.: 031804ACM
Construction Application No. 22080001

Chairman and Members:

T5@Chicago II, LP (T5) currently owns and operates a data center located at 200 Innovation Drive, Elk Grove Village, IL ("the facility", "the data center"). This facility is permitted to construct 11 MTU diesel-fired emergency generators (GEN01, GEN-R1, and GEN03 – GEN11) under a Construction Permit (Source I.D. No.: 031804ACM), issued on December 14, 2021 (Current Permit). Each of the 11 permitted generators is rated at 3,250 kilowatts (kWe) and will be used to provide emergency power to support data center operations in the event of utility power interruptions or a related on-site failure.

T5 originally submitted a modification application which was received on August 1, 2022 to install one additional generator at the facility, for a total of 12 generators on site. Review and issuance of a revised permit related to this modification were delayed to allow for multiple phases of revisions to the application, as described below. These revisions were required to account for market unpredictability and customer changes which could not be postponed into subsequent modifications due to anticipated construction schedules. The final modification application was submitted to the agency in May 2023. This updated application package proposed the following changes:

1. Update the naming convention of the currently permitted 11 generators to GEN01 – GEN11;
2. Construct and operate four new generators (GEN12 – GEN15), which includes the single generator proposed in the original modification in August 2022 plus three additional generators; and,
3. Installation of either MTU 3,250 kWe units or Kohler 3,250 kWe units for all future installations.

Due to supply chain issues, T5 could not accurately identify the generator make and models that will be installed onsite for the remaining generators, GEN03 – GEN05 and GEN07 - GEN15. To address this unpredictability, T5 narrowed their generator selections to MTU generator set with generator model 20V4000 DS3250 engine model 20V4000G94S (3,250 kWe), and Kohler generator model KD3250 engine model KD83V16 (3,250 kWe). Five of the 11 permitted generators (GEN01, GEN02, GEN03, GEN04, and GEN06) have recently been constructed and become operational. The remaining generators are under various stages of construction or not yet constructed.

With this Variance Determination Request (letter), T5 is requesting the allowance to commission two Kohler generators (GEN05 and GEN07) prior to the revised construction permit issuance (Application No. 22080001). These generators are currently installed and must finish all commissioning activities starting

this month (June 2023) to meet the customer deadline of August 1, 2023. As defined by the Environmental Protection Agency (EPA) in Question 39 of the Implementation Question and Answer Document dated April 2, 2013 (Attachment 1); the "commissioning period" is considered to be the final phase of the construction process. Activities conducted during the commissioning period include: checking all mechanical, electrical, and control systems for the reciprocating internal combustion engine (RICE) and all related equipment; and confirming the performance measures specified in the purchase agreement. Thus, this commissioning operation is considered to still be part of the construction process.

On Page 8 of the Current Permit (Permit Condition 13a.ii, Attachment 2), various emission limits are listed for the operation of the generators. The Kohler generators (GEN05 and GEN07) exceed these limits for two pollutants:

1. Carbon Monoxide (CO) Emission factor of 0.13 pounds per gallon (lb/gal); and,
2. Nitrogen Oxides (NO_x) Emission Factor of 0.30 lb/gal.

The Kohler generators emission factors are 0.22 lb/gal for CO and 0.40 lb/gal for NO_x. The pending revised permit (Construction Application No. 22080001) incorporates the differences in emission factors and resultant decrease in allowable fuel for the facility to maintain compliance with the 45 ton per year NO_x limit. However, this permit is not anticipated to be issued until July or August 2023 (Construction Application No. 22080001). Since these two Kohler generators require commissioning completion ahead of the issuance of the revised permit, T5 is requesting a determination for enforcement discretion for this construction activity. If the August 1, 2023 deadline is not met, T5 will incur significant financial penalties with their customer as they are contracted to have these two generators fully operational by that date. Please note that air pollutant emissions from the commissioning activities will be tracked against operational, fuel consumption, and emission limits specified in both the Current Permit and limits specified in the draft permit (Construction Application No. 22080001). The combined pound per hour and ton per year emission limits will not be exceeded with this construction activity. Once the revised permit is issued in July or August, the operation of these units will be compliant.

We appreciate your ongoing assistance. If you or your staff require any additional information regarding this letter, please contact Tiffany Cuni of Environmental Resources Management (ERM) at (513) 830-9062.

Sincerely,

Robbie Sovie



Executive Vice President
T5@Chicago II, LP

cc: Len Fransen, T5
Tiffany Cuni, ERM

Attachment 1

Question 39 of the Implementation Question and Answer Document dated April 2, 2013

37) If an engine has two or more catalysts or stacks, how does the owner/operator determine compliance with the percent reduction requirement?

For determining compliance with the carbon monoxide (CO) or formaldehyde percent reduction standard, a facility would have to measure flow rate in each stack, and measure pollutant parts per million (ppm) levels in each stack before and after the catalyst. With these values, the facility would then determine a flow weighted pollutant ppm value (e.g., ppm of CO) before and after the catalyst. A flow weighted ppm value would be calculated for both pre- and post-catalyst as follows, for CO for example:

$(\text{CO ppm stack 1} * \text{flow stack 1} + \text{CO ppm stack 2} * \text{flow stack 2}) / (\text{flow stack 1} + \text{flow stack 2})$.

The facility then determines the CO percent reduction according to subpart ZZZZ, but using the flow weighted CO ppm values for pre-catalyst and post-catalyst CO. Note, when determining CO percent reduction, the measured CO ppm values are normalized to 15% oxygen (O₂).

Alternatively, if the stacks are equally sized (e.g., same length and diameter) and the pressure drops across each catalyst are about equal (e.g., within 10%) a facility could sample upstream and downstream of the catalyst by drawing emissions from each stack into a combined line for determining pre- and post-catalyst ppm values. A facility would do this by using a pair of flow meters leading to a “T” to ensure an equal draft is being pulled from the individual stacks both up and downstream of the catalyst. The upstream and downstream sampled emissions from the two stacks would be combined and the facility would record one ppm value for the engine pre-catalyst and one ppm value post-catalyst.

I. Other:

38) Under subpart ZZZZ, emergency RICE are allowed to operate a specified number of hours per year in certain non-emergency situations, and certain limited use RICE are allowed to operate 100 hours per year. Does “year” mean calendar year, 12-month block average, or fiscal year?

Although the term “year” is not defined in subpart ZZZZ in all cases, the EPA interprets “year” to mean “calendar year” because it is the most appropriate time frame for monitoring the operation of emergency and limited use RICE.

39) Is the “commissioning period” of the RICE considered the initial “startup” of the unit?

No. The EPA interprets the “commissioning period” to be the final phase of the construction process. Activities conducted during the commissioning period include: checking all mechanical, electrical, and control systems for the RICE and all related equipment; and confirming the performance measures specified in the purchase agreement. The EPA understands that the commissioning period may take up to 2 weeks to complete. The EPA does not consider the “commissioning period” as the initial startup of the unit as long as the RICE is not being used for its intended purpose or any other beneficial use at the facility during this time. Site-specific determinations of initial startup may be required for facilities that operate in a commissioning mode for excessive periods of time.

40) What requirements apply to a stationary SI RICE with a site rated HP and maximum engine power less than 500 HP that is located at an area source of HAP if construction commenced on or after June 12, 2006 and the engine was manufactured before July 1, 2008?

Attachment 2

Page 8, Permit Condition 13a.ii of the Current Permit

13a. Emissions from and operation of Diesel-Powered Emergency Generators Gen01, Gen-R1 and Gen02 - Gen11 (combined) shall not exceed the following limits:

- i. Distillate fuel oil consumption: 2,453 gal/hour and 299,800 gal/year (combined).
- ii. Emissions from the combustion of distillate fuel oil (combined):

<u>Pollutant</u>	<u>Emission Factor (lb/gal)</u>	<u>Emissions</u>	
		<u>(lbs/Hr)</u>	<u>(Ton/Yr)</u>
Carbon Monoxide (CO)	0.13	318.89	19.49
Nitrogen Oxides (NO _x)	0.30	735.90	44.97
Particulate Matter (PM)	0.015	36.80	2.25
Sulfur Dioxide (SO ₂)	0.0003	0.74	0.05
Volatile Organic Material (VOM)	0.03	73.59	4.50

The above limits are based on the hourly and annual fuel consumption rates, and emission factors derived from manufacturer data sheets, except for sulfur dioxide which is based on the standard emission factor (Table 3.4-1, AP-42, Fifth Edition, Volume I, Supplement B, October 1996) with a fuel sulfur content of 0.0015%.

- b. Compliance with annual limits shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months.
14. This permit is issued based on the Potential to Emit (PTE) for Hazardous Air Pollutants (HAPs) as listed in Section 112(b) of the Clean Air Act from Diesel-Powered Emergency Generators Gen01, Gen-R1 and Gen02 - Gen11 being less than 10 tons/year of any single HAP and 25 tons/year of any combination of such HAPs. As a result, this permit is issued based on the emissions of all HAPs from Diesel-Powered Emergency Generators Gen01, Gen-R1 and Gen02 - Gen11 not triggering the requirements of Section 112(g) of the Clean Air Act.
15. This permit is issued based on Diesel-Powered Emergency Generators Gen01, Gen-R1 and Gen02 - Gen11 each having a displacement of less than 30 liters per cylinder and has been certified by the manufacturer to meet the standards of 40 CFR 60.4202(a) through (d). As a result, this permit is issued based on Emergency Generators Gen01, Gen-R1 and Gen02 - Gen11 not being subject to the testing requirements of 40 CFR 60.8.
- 16a. Pursuant to 35 Ill. Adm. Code 201.282, every emission source or air pollution control equipment shall be subject to the following testing requirements for the purpose of determining the nature and quantities of specified air contaminant emissions and for the purpose of determining ground level and ambient air concentrations of such air contaminants: