

Georgia Department of Natural Resources

Environmental Protection Division • Air Protection Branch

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Chris Clark, Commissioner

F. Allen Barnes, Director

NARRATIVE

TO: Furqan Shaikh

FROM: Tyneshia Tate

DATE: August 3, 2010

Facility Name: **Equinix**

AIRS No.: 12100868

Location: Atlanta, GA (Fulton County)

Application #: 19741

Date of Application: June 9, 2010

Background Information

Equinix (formerly Switch and Data – Atlanta Data Center) is located at 180 Peachtree Street N.W., Atlanta, Georgia. The facility is an electronic data center that uses emergency power generators for emergency standby operation with no peaking power usage.

According to Application 19741, Switch and Data – Atlanta Data Center (Equinix) was issued a letter dated February 10, 2010 for the operation of three emergency generators (Source Codes: GN01, through GN03) that fire distillate fuel oil. Each emergency generator is not allowed to operate more than 200 hours per year.

Purpose of Application

Application 19741 proposes the construction and operation of three additional diesel fuel-fired emergency generators rated at 2,500 kW (Source Codes: GN04 through GN06). The installation of the proposed generators would result in a change in status for Equinix from a minor facility to a NSR and Title V major facility, without obtaining operating and emission limits. As part of this application, however, the facility has proposed to take a NO_x emission limit to remain below applicable major source thresholds. The facility also requested to limit equipment operating hours to remain below applicable major source thresholds. However, this limit was not added to Permit Number 7376-121-0868-S-01-0 as it is unnecessary because of the requested and imposed NO_x emission limit of 25 tons per twelve consecutive months. The applicability of these regulations will be discussed further below.

A public advisory was issued, and it ended on July 23, 2010. EPD received no comments.

Updated Equipment List

The following is a list of the permitted sources located at the facility.

Generators

Emission Units				Associated Control Devices	
Source Code	Description	Construction Date	Installation Date	Source Code	Description
GN01	Caterpillar 2,500 kW distillate fuel oil fired Emergency Generator	2010	5/2010	None	NA
GN02	Caterpillar 2,500 kW distillate fuel oil fired Emergency Generator	2010	5/2010	None	NA
GN03	Caterpillar 2,500 kW distillate fuel oil fired Emergency Generator	2010	5/2010	None	NA
GN04*	Caterpillar 2,500 kW distillate fuel oil fired Emergency Generator	2010	1/2011	None	NA
GN05*	Caterpillar 2,500 kW distillate fuel oil fired Emergency Generator	2010	1/2011	None	NA
GN06*	Caterpillar 2,500 kW distillate fuel oil fired Emergency Generator	2010	1/2011	None	NA

*proposed within current application

Emissions Summary

The following emission estimates are based on the generators only operating 199 hours year¹. Rated Speed “Not to Exceed Data” dated April 21, 2008 was used to calculate potential NO_x, carbon monoxide (CO), volatile organic compound (VOC), and particulate matter (PM) emissions at 100 percent load for Generators GN01 through GN06.

Facility-Wide Emissions
(in tons per year)

Pollutant	Potential Emissions			Actual Emissions ¹		
	Before Mod.	After Mod.	Emissions Change	Before Mod.	After Mod.	Emissions Change
PM	0.06	0.12	+0.06	-	-	-
NO _x ²	14.36	28.72	+14.36	-	-	-
SO ₂	0.44	0.87	+0.44	-	-	-
CO	1.75	3.50	+1.75	-	-	-
VOC	0.32	0.64	+0.32	-	-	-

¹ Georgia Department of Natural Resources Environmental Protection Division Air Protection Branch *Procedure to Calculate a Facility's "Potential to Emit" and to determine its Classification* Revised August 26, 2008 page 1. Per this document, any physical and operational limitation on the capacity of the source to emit a regulated air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is legally and practically enforceable.

Pollutant	Potential Emissions			Actual Emissions ¹		
	Before Mod.	After Mod.	Emissions Change	Before Mod.	After Mod.	Emissions Change
Max. Individual HAP ³	-	-	-	-	-	-
Total HAP ³	-	-	-	-	-	-

¹Actual emissions were not estimated.

²Potential NO_x emissions will be limited to 25 TPY.

³The facility will fire distillate fuel oil. Hazardous air pollutants (HAPs) are expected to be negligible.

Regulatory Applicability

Parts 51.165 and 52.21, Chapter I, Title 40 of the Code of Federal Regulations (40 CFR Part 51.165) SIP Requirements Review of New Sources and Modifications Permit Requirements and (Part 52.21) (Prevention of Significant Deterioration (PSD))

In accordance with current EPD guidance, emissions of particulate matter with an aerodynamic diameter less than or equal to 2.5 microns (PM_{2.5}) are assumed to equal emissions of particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM₁₀). Therefore, these pollutants will be discussed under one heading in this narrative; however PM₁₀ emissions are potentially regulated under 40 CFR 52.21 while PM_{2.5} emissions are regulated under 40 CFR 51.165.

This regulation applies to “major sources” of emissions. According to 40 CFR 52.21(b)(1)(i)(b), any stationary source which emits, or has the potential to emit, 250 tons per year or more of a regulated NSR pollutant is a major source under NSR/PSD review. Equinix is located in a non-attainment area for ozone (VOC and/or NO_x) and a non-attainment area for PM_{2.5}. The non-attainment NSR significance level (SL) for NO_x emissions is 25 tons per year (Georgia Air Rule 391-3-1 .03(8)(c)13.(i)).

Generators 1 through 3 were previously exempted from permitting. The current application, Application 19741, proposes the construction and operation of Generators GN04 through GN06.

The potential NO_x emissions would exceed 25 tons per year, if generators GN01 through GN06 operated without any limitations. However, the facility limits operation of generators GN01 through GN03 to emergency use only that will operate when the facility loses power from the power grid. In addition, Equinix has requested a limit of NO_x emissions from this modification below the NSR major source threshold. To insure that NO_x emissions will remain below the 25 tons per year major source levels, generators GN01 through GN06 will be permitted to operate in emergency standby operation only such that the total hours of operation for each generator is less than 200 hours during any consecutive twelve-month period. Equinix must install, calibrate, maintain, and operate a non-resettable continuous monitoring system (or device) for each emergency generator to track the hours operated during emergency service and the hours of operation in non-emergency service (maintenance and/or testing), to record the reason the engine was in operation during those time, and to record the cumulative total hours of operation. In addition, Equinix requested to limit the total combined operating hours of generators GN01 through GN06 to less than 1,038 hours during any consecutive twelve-month period. However, this limit was not added to Permit Number 7376-121-0868-S-01-0 as it is unnecessary because of the requested and imposed NO_x emission limit of 25 tons per twelve consecutive months.

In addition, the facility must calculate monthly NO_x emissions for the emergency generators GN01 through GN06, based on the generator manufacturer’s emission rate factor (48.11 pounds of NO_x emissions per hour) for each engine at the 100% load, unless other emission factors are approved by the Division. The monthly emissions calculations will be used to determine the consecutive twelve-month period NO_x emissions from Generators GN01 through GN06. Therefore, this facility is not considered a major source under non-attainment NSR as the result of the installation and operation of Generators GN04 through GN06. The following equation will be used to calculate monthly NO_x emissions.

$$\text{Monthly Emissions of NO}_x(\text{tons}) = \frac{\sum_{i=1}^6 (\text{Emission Rate @ Load } L (\text{lb / hr})_i) * (\text{Hrs}_i)}{2000}$$

Where:

Emission Rate @ Load L = the generator manufacturer's emission rate factor (48.11 pounds of NO_x emissions per hour) for each engine at the 100% load, unless other emission factors are approved by the Division.

Hrs = the total operating hours for each engine in the given month.

i = generator number (6 total)

To insure that the twelve-consecutive month NO_x emissions rates from Generators GN01 through G06 are determined in a Division approved manner, Equinix must submit sample monthly NO_x emissions calculations for the Division's review within 120 days of the issuance of its permit.

Part 60, Chapter I, Title 40 of the Code of Federal Regulations (40 CFR Part 60) - New Source Performance Standards (NSPS) Subpart A – General Provisions

Except as provided in Subparts B and C of 40 CFR Part 60, the provisions of this regulation apply to the owner or operator of any stationary source which contains an affected facility, the construction or modification of which is commenced after the date of publication in this part of any standard (or, if earlier, the date of publication of any proposed standard) applicable to that facility [40 CFR 60.1(a)]. Any new or revised standard of performance promulgated pursuant to Section 111(b) of the Clean Air Act applies to Equinix's applicable equipment and/or processes and any applicable source/equipment for which the construction or modification is commenced after the date of publication in 40 CFR Part 60 of such new or revised standard (or, if earlier, the date of publication of any proposed standard) applicable to that equipment and/or processes [40 CFR 60.1(b)].

Part 60, Chapter I, Title 40 of the Code of Federal Regulations (40 CFR Part 60) New Source Performance Standards (NSPS) Subpart III—Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

This regulation is applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE) as specified in paragraphs (a)(1) through (3) of 40 CFR 60.4200. For the purposes of this regulation, the date that construction commences is the date the engine is ordered by Equinix [40 CFR 60.4200(a)]. Equinix must operate and maintain generators GN01 through G06 that achieve the emission standards as required in 40 CFR 60.4205 according to the manufacturer's written instructions or procedures developed by Equinix that are approved by the engine manufacturer, over the entire life of the engines [40 CFR 60.4206].

Equinix proposes to use diesel fuel in the proposed generators GN01 and GN06 engines. Equinix must use diesel fuel that meets the requirements of 40 CFR 80.510(a) [40 CFR 60.4207(a)]. Beginning October 1, 2010, stationary CI ICE subject to 40 CFR Part 60, Subpart III with a displacement of less than 30 liters per cylinder that use diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(b) for nonroad diesel fuel [40 CFR 60.4207(b)].

Emergency stationary ICE may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State, or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. There is no time limit on the use of emergency stationary ICE in emergency situations. Equinix may petition the Division for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if Equinix maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. For owners and operators of emergency engines meeting standards under 40 CFR 60.4205 but not 40 CFR 60.4204, any operation other than emergency operation, and maintenance and testing as permitted in this section, is prohibited [40 CFR 60.4211(e)].

Part 70, Chapter I, Title 40 of the Code of Federal Regulations (40 CFR Part 70) - State Operating Permit Programs [Title V]

The regulations in 40 CFR Part 70 provide for the establishment of comprehensive State air quality permitting systems consistent with the requirements of Title V of the Clean Air Act (Act) (42 U.S.C. 7401, *et seq.*). These regulations define the minimum elements required by the Clean Air Act for State operating permit programs and the corresponding standards and procedures by which the Administrator will approve, oversee, and withdraw approval of State operating permit programs. Georgia has an established such a program. Equinix, because it can potentially emit applicable pollutants above the applicable major source thresholds, is subject to 40 CFR Part 70. All sources subject to these regulations must have a permit to operate that assures compliance by the source with all applicable requirements [40 CFR 70.1(b)].

The potential NO_x emissions would exceed 25 tons per year, if generators GN01 through GN06 operated without any limitations. However, the facility limits operation of generators GN01 through GN03 to emergency use only that will operate when the facility loses power from the power grid. In addition, Equinix has requested a limit of NO_x emissions from this modification below the NSR major source threshold. To insure that NO_x emissions will remain below the 25 tons per year major source levels, generators GN01 through GN06 will be permitted to operate in emergency standby operation only such that the total hours of operation for each generator is less than 200 hours during any consecutive twelve-month period. Equinix must install, calibrate, maintain, and operate a non-resettable continuous monitoring system (or device) for each emergency generator to track the hours operated during emergency service and the hours of operation in non-emergency service (maintenance and/or testing), to record the reason the engine was in operation during that time, and to record the cumulative total hours of operation. In addition, Equinix requested to limit the total combined operating hours of generators GN01 through GN06 to less than 1,038 hours during any consecutive twelve-month period. However, this limit was not added to Permit Number 7376-121-0868-S-01-0 as it is unnecessary because of the requested and imposed NO_x emission limit of 25 tons per twelve consecutive months as previously stated.

To insure that the twelve-consecutive month NO_x emissions rates from Generators GN01 through GN06 are determined in a Division approved manner, Equinix must submit sample monthly NO_x emissions calculations for the Division's review within 120 days of the issuance of its permit.

Georgia Rule for Air Quality Control (Georgia Rule) 391-3-1-.02(2)(b) Emission Limitations and Standards Visible Emissions

This regulation limits opacity to less than forty (40) percent, except as may be provided in other more restrictive or specific rules or subdivisions of *Georgia Rule 391-3-1-.02(2)*. This limitation applies to direct sources of emissions such as stationary structures, equipment, machinery, stacks, flues, pipes, exhausts, vents, tubes, chimneys or similar structures. This regulation is applicable to the generators GN01 through GN06, and other supporting equipment with the capability of emitting particulates.

Georgia Rule 391-3-1-.02(2)(g) Emission Limitations and Standards Sulfur Dioxide

This regulation regulates fuel sulfur content, by weight. This regulation is applicable to the generators GN01 through GN06.

Georgia Rule 391-3-1-.02(2)(yy) Emissions of Nitrogen Oxides from Major Sources

This regulation applies to sources in listed counties with potential NO_x emissions greater than 25 tons per year and requires reasonably available control technology in controlling emissions of NO_x. Per Georgia Rule 391-3-1-.02(2)(yy)5, this regulation is not applicable to equipment subject to Georgia Rule 391-3-1-.02(2)(mmm). Generators GN01 through GN06 are each subject to Georgia Rule 391-3-1-.02(2)(mmm), therefore, the requirements of Georgia Rule 391-3-1-.02(2)(yy) are not applicable to Equinix.

Georgia Rule 391-3-1-.02(2)(mmm) NO_x Emissions from Stationary Gas Turbines and Stationary Engines used to Generate Electricity

This regulation applies to gas turbines and stationary engines located in the listed counties and specifies NO_x emission limits for such sources. Equinix is located in Fulton County, a listed county. Per Georgia Rule 391-3-1-.02(2)(mmm)7, emergency generators, as defined by the rule, are not subject to the emission limits included in this regulation. Per the regulation, an emergency stationary engine operates only when electric power from the local utility is not available and which operates less than 200 hours per year. Therefore, Generators GN01 through GN06 are not subject to the emission limits of this regulation.

Georgia Rule 391-3-1-.03(1) Construction (SIP) Permit

This regulation requires that any person prior to beginning the construction or modification of any facility which may result in an increase in air pollution must obtain a permit for the construction or modification of such facility from the Director upon a determination by the Director that the facility can reasonably be expected to comply with all the provisions of the Clean Air Act and the rules and regulations promulgated thereunder. Equinix has applied for a construction permit under this regulation.

Georgia Rule 391-3-1-.03(2) Operating (SIP) Permit

This regulation requires that any person prior to beginning the operating of any facility which may result in an increase in air pollution must obtain a permit for the operation of such facility within thirty days after commencement of normal operations. Equinix has applied for an operating permit under this regulation.

Permit Conditions**Section 1.0: General Requirements**

No permit conditions were included, in addition to the standard permit conditions.

Section 2.0: Allowable Emissions

Permit Condition 2.1 – Limits the nitrogen oxides emissions from Generators GN01 through GN06.

Permit Condition 2.2 – Limits the operating hours of Generators GN01 through GN06.

Permit Condition 2.3 – General applicability of Georgia Rule 391-3-1-.02(2)(b) to Generators GN01 through GN06.

Permit Condition 2.4 – General applicability of 40 CFR Part 60, Subpart IIII to Generators GN01 through GN06.

Permit Condition 2.5 – Limits the non-emergency operating hours of Generators GN01 through GN06.

Permit Condition 2.6 – Limits sulfur content of fuel fired in generators GN01 through GN06.

Section 3.0: Fugitive Emissions

No permit conditions were included, in addition to the standard permit condition.

Section 4.0: Requirements for Control Equipment

Permit Condition 4.1 – Requires installation of control equipment on generators GN01 through GN06 per manufacturer's requirements.

Permit Condition 4.2 – Requires maintenance of generators GN01 through GN06 per manufacturer's requirements.

Section 5.0: Monitoring

Permit Condition 5.1 – Explains general requirements for the operation of a continuous monitoring system.

Permit Condition 5.2 – Requires the installation of an operation hours meter on each of the Generators GN01 through GN06.

Section 6.0: Performance Testing

No permit conditions were included, in addition to the standard permit condition.

Section 7.0: Notification, Reporting and Record Keeping

Permit Condition 7.1 – Defines the monthly operating records retention requirement of Generators GN01 through GN06.

Permit Condition 7.2 – Requires calculation of monthly emergency operating hours for Generators GN01 through GN06.

Permit Condition 7.3 – Requires calculation of 12-consecutive month operating hours for Generators GN01 through GN06.

Permit Condition 7.4 – Requires calculation of monthly non-emergency operating hours for Generators GN01 through GN06.

Permit Condition 7.5 – Requires calculation of monthly NO_x emissions from Generators GN01 through GN06.

Permit Condition 7.6 – Requires calculation and 12-consecutive month NO_x emissions from Generators GN01 through GN06.

Permit Condition 7.7 – Provides methods of compliance demonstration for Generators GN01 through GN06.

Permit Condition 7.8 – Requires recordkeeping for fuel certification requirements.

Permit Condition 7.9 – Requires submittal of sample records and calculations required by Conditions 7.1 through 7.8.

Permit Condition 7.10 – Requires notification of the startup of each of Generators GN04 through GN06.

Section 8.0: Special Conditions

Permit Condition 8.1 – Explains the Division's authority to determine additional control of emissions.

Permit Condition 8.2 – Requires facility to pay an annual permit fee.

Toxic Impact Assessment

The facility's potential emission sources will emit toxic emissions. However, based on the proposed fuel usage, the potential toxic emissions are considered negligible. Therefore, no toxic impact assessment was conducted.

Summary & Recommendations

In summary, it is recommended that Air Quality Permit No. 7376-121-0868-S-01-0 be issued for the Equinix facility. A public advisory was issued which expired on July 23, 2010. No public comments were received during the public advisory period. The facility is a synthetic NSR minor source and a synthetic Title V major source.

Equinix will be monitored by the Air Protection Branch Stationary Source Compliance Program as it is a new synthetic minor source