

Appendix I

Air Quality Technical Analysis



### Air Quality Technical Analysis

For the Proposed Project, the Clean Air Act general conformity applies to emissions of pollutants and precursor pollutants for which Nassau County is designated as nonattainment or maintenance. Nassau County is a moderate nonattainment area for the 2008 8-hour ozone standard and a maintenance area for the 1971 maximum carbon monoxide (CO), 1997 annual average fine particulate matter (PM<sub>2.5</sub>), and 2006 24-hour average PM<sub>2.5</sub> standards (EPA 2017). Nassau County is an attainment area for the remaining criteria pollutants; therefore, general conformity requirements do not apply to other criteria pollutants in the study area and a *de minimis* evaluation is not necessary.

The table below shows the applicable *de minimis* thresholds for each pollutant (the term “precursor” in the table refers to the pollutants). A general conformity determination would not be required if an applicability analysis shows the emissions of the Proposed Project during construction and operation would not exceed the *de minimis* thresholds.

#### **Applicable General Conformity *de minimis* Thresholds (for Pollutants for which Nassau County Is Designated as Nonattainment or Maintenance)**

Pollutant	Type	<i>De minimis</i> Threshold (tons/year)	Nassau County Attainment Status
Carbon monoxide	Direct emissions of CO	100	Maintenance area for 1971 1-hour and 8-hour standards
Volatile organic compounds	Ozone precursor	50	Non-attainment for 2008 8-hour ozone standard
Nitrogen oxide	Ozone precursor and PM <sub>2.5</sub> precursor	100	
PM <sub>2.5</sub>	Direct emissions of PM <sub>2.5</sub>	100	Maintenance area for 1997 annual average PM <sub>2.5</sub> and 2006 24-hour average PM <sub>2.5</sub> standards
Sulfur dioxide	PM <sub>2.5</sub> precursor	100	

### **Construction**

Construction activities would result in short-term emissions of criteria pollutants from off-road, heavy-duty construction equipment (e.g., backhoes, excavators, and graders), haul trucks, construction worker commutes, and fugitive dust. Based on the attainment status of Nassau County, a general conformity emissions analysis was prepared for nitrogen oxide (NO<sub>x</sub>), volatile organic compounds (VOC), and PM<sub>2.5</sub>. Diesel equipment and vehicles emit substantially less sulfur dioxide (SO<sub>2</sub>) when compared to direct PM<sub>2.5</sub> emissions, and, consequently, the PM<sub>2.5</sub> precursor SO<sub>2</sub> was not analyzed. (EPA’s National Emissions Inventory data for New York State shows that SO<sub>2</sub> emissions from highway vehicles are 20 percent of PM<sub>2.5</sub> emissions from highway vehicles. Therefore, if the general conformity *de minimis* threshold is not exceeded for PM<sub>2.5</sub> direct

emissions, it cannot be exceeded for SO<sub>2</sub>). Construction of the Proposed Action would take approximately four years, with the highest emissions occurring in the early phases that would require the most excavation and haul truck and heavy equipment activity. Because the general conformity *de minimis* criteria are expressed on an annual basis, 2019 was assumed to be the peak construction year.

Construction emissions were quantified using the Motor Vehicle Emission Simulator (MOVES2014a) model for haul truck and worker commute emissions, the NONROAD model for off-road equipment, and EPA AP-42 procedures for quantifying fugitive dust emissions (EPA 1995).<sup>1</sup> Assumptions regarding equipment requirements, workers, truck trips, and the quantity of soil to be moved were developed for the analysis.

The table below summarizes the construction emission analysis results. The general conformity *de minimis* thresholds would not be exceeded.

**2019 Peak Construction Year Emissions Summary (Tons)**

	<b>CO</b>	<b>NO<sub>x</sub></b>	<b>VOC</b>	<b>PM<sub>2.5</sub></b>
Off-road heavy equipment	2.7	2.7	0.8	0.2
On-road haul trucks and worker commutes	1.4	6.2	0.3	0.3
Fugitive dust	NA	NA	NA	0.9
Dredging	0.3	0.6	0.0	0.0
<b>Total</b>	<b>4.5</b>	<b>9.5</b>	<b>1.1</b>	<b>1.4</b>
General conformity <i>de minimis</i> threshold	100.0	100.0	50.0	100.0
<i>De minimis</i> threshold exceeded?	No	No	No	No

Note: The construction impact analysis incorporates 2018 emissions factors. 2019 emissions factors would be lower, because vehicle fleet mix and equipment incrementally improve each year. As such, use of 2018 emissions factors presents a conservative analysis.

**Operation**

*Mobile Sources*

The Proposed Project would not result in substantial new vehicle trips or result in changes to traffic patterns. Therefore, a mobile source air quality impact analysis for the direct impacts of the Proposed Action is not necessary.

*Backup Generator*

Emissions from the backup power generator at the Education Center would only occur in emergencies/power outages and for periodic testing. Emissions from a 100 kW (402 horsepower) diesel backup generator were assumed. Emissions, were estimated based on the approximate horsepower, fuel type, and EPA’s AP-42, and the emissions were annualized based on up to 500 hours of operation (EPA 2015). The table below summarizes the results of the emergency

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<sup>1</sup> To present a conservative assessment of auto emissions, haul truck emission factors were used

generator analysis and demonstrates emissions would be below the general conformity *de minimis* criteria.

The 100-kW generator operating only for testing, or during emergency situations, would not result in combined emissions of hazardous air pollutants (HAPs) in excess of 25 tons per year. As such, it would not qualify as a major source, and the National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines (RICE MACT) would not apply.

<b>Pollutant</b>	<b>Emission Factor (lbs/hp-hr)</b>	<b>Source</b>	<b>Emissions @500 hrs/year (lbs)</b>	<b>Annual Emissions in Tons</b>
NOx	0.031	AP-42 Table 3.3-1	2,077.0	1.04
VOC	0.0025141	AP-42 Table 3.3-1 (TOC- exhaust plus crankcase)	168.4	0.08
SOx	0.00205	AP-42 Table 3.3-1	137.3	0.07
PM	0.0022	AP-42 Table 3.3-1	147.4	0.07
CO	0.00668	AP-42 Table 3.3-1	447.6	0.22
CO2	1.15	AP-42 Table 3.3-1	77,050.0	38.53

References:

Caterpillar 2014. STANDBY 300 ekW 375 kVA 60 Hz 1800 rpm 480 Volts. Specifications Sheet.

<http://s7d2.scene7.com/is/content/Caterpillar/LEHE0486-00>

EPA 2017. Green Book: New York Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants. [https://www3.epa.gov/airquality/greenbook/anayo\\_ny.html](https://www3.epa.gov/airquality/greenbook/anayo_ny.html). February 13, 2017

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