Case No. 9482

Revised Environmental Review Document, Section 5.0 Effect of Project Operation, Pages 5-1, 5-2, 5-3, and 5-4

5.0 Effects of Project Operation

This chapter identifies and discusses the potential operational impacts resulting from the proposed Repowering Project on the social, physical, and natural resources of the site and vicinity. It contains the following sections, in compliance with the regulatory requirement that the environmental information include, "[a] summary of the environmental and socioeconomic effects of the construction and operation of the project, including a description of the unavoidable impact and recommended mitigation," per COMAR 20.79.03.02.B.(1)(b):

- 5.1—Impacts on Air Quality
- 5.2—Impacts on Groundwater
- 5.3—Impacts on Surface Water Bodies
- 5.4—Ecological Impacts
- 5.5—Noise Impacts
- 5.6—Impacts on Solid Waste Disposal
- 5.7—Socioeconomic and Land Use Impacts

As was the case in Chapter 4.0, the existing environmental and socioeconomic conditions described in Chapter 2.0 constitute the baseline for assessing impacts. In addition, the potential impacts are presented in terms of their relationship with applicable regulations and standards.

5.1 Impacts on Air Quality

5.1.1 Introduction

Analyses were conducted to calculate the potential air quality impacts of emissions from the Project. These analyses are described in detail in the air quality information document contained in Appendix C. This section presents a summary of the approach used and the results obtained. The results demonstrate the operation of the facility (post-Project) will not cause or contribute to a violation of any applicable NAAQS.

5.1.2 NSR Applicability and Overview of Impact Analyses

Based on the NSR applicability analysis presented in Subsection 3.2.4.3, the proposed Project will not result in a significant increase in emissions of any NSR pollutant.

Per MDE request, in support of the CPCN and permit-to-construct applications, an air quality impact modeling, facility-only NAAQS analysis was performed. The analysis provided a demonstration through air dispersion modeling using agency-approved meteorological data that the post-Project emissions rates for criteria air pollutants will result in ambient air impacts that comply with NAAQS. Specifically, the NAAQS modeling analysis consisted of existing sources remaining in operation, proposed new emissions sources, and a representative, agency-approved ambient background concentration.

5.1.3 Analytical Approach

5.1.3.1 Air Quality Model

The most recent version of the American Meteorological Society (AMS)/EPA regulatory model (AERMOD) system (Version 18081, April 24, 2018), together with 5 years of preprocessed hourly meteorological data were used in the analysis. AERMOD was used to obtain impact predictions for both short-term (i.e., periods equal to or less than 24 hours) and annual averaging periods.

5.1.3.2 Meteorological Data

The meteorological data used in the air quality modeling consist of the most recent 5 years (2013 to 2017) of NWS data from the BWI surface meteorological station and the Sterling, Virginia, upper air station. The surface meteorological NWS site (Weather-Bureau-Army-Navy [WBAN] Station No. 93721) is located at BWI approximately 32 kilometers southeast of the Project site. The meteorological data was provided by MDE to ECT on March 27, 2018.

5.1.3.3 Emissions Source Input Data

The Project modeling analysis included the three proposed CTs, a newly installed black-start generator, and the existing sources remaining in operation (CT, fire water pump, and emergency generator). During normal operations, the proposed CTs will operate over a range of loads (50 to 100 percent) and ambient temperatures. Appendix C provides a summary of the 21 operating

cases evaluated for natural gas and the 21 operating cases evaluated for ULSD fuel oil for the proposed CTs. Plume dispersion and ground-level impacts will vary, since emissions rates, exit temperatures, and exhaust gas velocities are different for the operating scenarios. The operating cases enveloped the range of ambient temperatures to create values that represent worst-case parameters and emissions rates for four operating loads (100, 75, 60 and 50 percent). These four worst-case operating scenarios were evaluated using the refined AERMOD system. Emissions associated with the startup of the proposed CTs were also evaluated.

The newly installed black-start generator will be tested once a year for 1 hour. Therefore, the modeled short-term emissions (24 hours or less) were normalized to operate 1 hour within the averaging period for the assessment of short-term modeled averaging periods. The newly installed black-start generator is only expected to operate when there is no electricity on the grid; however, 100 hours of annual operation were conservatively assumed for assessment of annual modeled averaging periods.

The existing CT was modeled based on the maximum emissions provided for the 5-year operation period of 2012 through 2016. The emergency diesel generator is tested for 30 minutes every month, while the fire water pump is tested for 30 minutes every week. Therefore, the modeled short-term emissions (24 hours or less) were normalized to operate 30 minutes within the averaging period for the assessment of short-term modeled averaging periods.

The emergency generator and fire water pump are expected to operate no more than 10 and 50 hr/yr, respectively. However, the modeled annual emissions rates were conservatively based on 100 hours of annual operation for the assessment of annual modeled averaging periods.

Emissions parameters for the Project sources were based primarily on information provided by equipment vendors. Some emissions inputs were derived using EPA and other emissions factors and equipment design data.

5.1.4 Summary of Air Quality Impacts

The primary objective of the analysis was to demonstrate that post-Project emissions from the facility will result in air quality impacts that comply with NAAQS. Table 5.1-1 summarizes the

maximum modeled air quality concentrations calculated by AERMOD. As shown in the table, the maximum modeled concentrations, when combined with a representative background concentration, are less than the applicable NAAQS for all pollutants and averaging times.

Table 5.1-1. Facility Maximum Modeled Concentrations Compared to NAAQS

Pollutant	Averaging Period	Maximum Modeled Concentration (µg/m^3)*	Monitored Background Concentration (µg/m^3)	Total Concentration (µg/m^3)	NAAQS (µg/m^3)	Complies? (Yes/No)
CO	1-hour†	5,291.21	5,257.14	10,548.35	40,000	Yes
	8-hour†	262.19	1,888.89	2,151.08	10,000	Yes
NO_2	1-hour‡	45.76	90.24	136.00	188	Yes
	Annual§	3.01	29.92	32.93	100	Yes
PM_{10}	24-hour£	6.22	35.00	41.22	150	Yes
$PM_{2.5}$	24-hour‡	2.12	22.67	24.79	35	Yes
	Annual¥	0.18	9.47	9.65	12	Yes
SO_2	1-hour€	116.04	49.65	165.69	196	Yes
	3-hour†	68.39	114.92	183.31	1,300	Yes
Lead	Rolling 3-month	0.0007	0.004	0.005	0.15	Yes

Note: µg/m^3 = microgram per cubic meter.

*Maximum modeled concentration across all fuels and operating loads.
†Not to be exceeded more than once per calendar year.
‡98th percentile averaged over 3 years.
§Annual mean.
£Not to be exceeded more than once per year on an average over 3 years.
¥Annual arithmetic mean concentration averaged over 3 years.
€99th percentile of 1-hour daily maximum concentrations averaged over 3 years.

Source: ECT, 2018.

5.2 Impacts on Groundwater

The proposed new Project CTs will have no direct discharges to groundwater other than percolation from onsite stormwater bioretention pond. Other waste streams will be discharged directly the local municipal wastewater system.