

5. AIR TOXICS ANALYSIS

Georgia Rule for Air Quality 391-3-1-.02(2)(a)3.(ii) requires that sources of air emissions safeguard the public health, safety and welfare of the people of the State of Georgia. Georgia's air toxics program that was established pursuant to this rule requires applicants to evaluate the potential ambient air concentrations of specific compounds identified as toxic air pollutants (TAP). This is done using air dispersion modeling methods and comparing maximum predicted ambient air concentrations to the Allowable Ambient Concentration (AAC) as provided by the GA EPD in Appendix A of "Georgia Guideline for Ambient Impact Assessment of TAP" (GA EPD May 2017, Appendix A updated October 2018). An air dispersion model incorporates the source-specific parameters such as stack height, exit temperature, flow rate, and spatial location with meteorological conditions and building geometry to approximate the dispersion characteristics of an exhaust plume across a study area. The air modeling procedures for this assessment are outlined in "Georgia Guideline for Ambient Impact Assessment of TAP" (GA EPD May 2017).

This permit application conducted the assessment for the facility's TAP emissions including the proposed new equipment in accordance with GA EPD Guidance.⁴ Prior to conducting an air modeling analysis for TAP, it is necessary to first evaluate whether the emission rates exceed the Minimum Emission Rate (MER), which are *deminimis* emission rates below which a dispersion modeling demonstration is not required. A summary of TAP emission rates compared with the MER is given in Table 5-1, indicating that emissions of hydrogen chloride (HCl), hydrogen fluoride (HF), lead (Pb), and selenium (Se) require further evaluation using dispersion modeling methods. Facility-wide potential emissions of HCl, HF, Pb and Se were modeled, accordingly, to demonstrate that the AAC thresholds will be preserved. This section provides the detailed description for the analysis and results.

Table 5-1: Air Toxics Modeling Requirement Summary

TAP		Potential Emission Rate (lb/yr)	Minimum Emission Rate (MER) (lb/yr)	Modeling Required (yes/no)
7664-41-7	Ammonia	2,900	24,300	No
7647-01-0	Hydrogen Chloride	10,500	4,870	Yes
7664-39-3	Hydrogen Fluoride	9,305	284	Yes
7439-92-1	Lead	1,060	5.84	Yes
7782-49-2	Selenium	1,060	23.4	Yes

5.1 Model Selection

For the purposes of this dispersion modeling analysis, the USEPA regulatory model AERMOD version 22112 was used. AERMOD is the recommended model for air quality analyses per US EPA's Guideline on Air Quality Models (40 CFR Part 51, Appendix W). AERMOD is a steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. Several model options and input parameters are specified to customize the dispersion calculations to best approximate actual aerodynamic conditions at the site. The modeling was performed with AERMOD View commercial software developed by Lakes Environmental. The model options and input parameters used for this analysis project were selected in accordance with GA EPD guidelines and are discussed below.

⁴ GUIDELINE FOR AMBIENT IMPACT ASSESSMENT OF TOXIC AIR POLLUTANT EMISSIONS, Revised May 2017