STATE OF NEW HAMPSHIRE
Department of Environmental Services
Air Resources Division
Intra-office Memorandum

TO: Cathy Beahm, SIP Program Mgr.
SIP Planning & Rulemaking Bureau

DATE: October 4, 2019

FROM: David Healy, Air Quality Analyst/Modeler
Atmospheric Science & Analysis Section (ASA)

AFS #: 3301100165
App #: 18-0227

SUBJ: Saint-Gobain Performance Plastics

UTMs: 298802, 4752015

Modeling Project Summary

- **Purpose:** Air dispersion modeling for RTAPs for evaluation of proposed RTO and antenna coating line vents
- **Initial assumptions (modeling input):** 8,760 hours/year, potential RTAP emissions
- **Pass/Fail (if failed for what):** Pass
- **Limits Based on Modeling:** N/A

Saint-Gobain Performance Plastics (SGPP) in Merrimack has submitted a temporary permit application to install a regenerative thermal oxidizer (RTO) to control emissions of perfluorinated compounds (PFCs). This is being done in response to a determination by the New Hampshire Department of Environmental Services (NHDES) pursuant to NH Statute Chapter 125-C:10-e, *Requirements for Air Emissions of Perfluorinated Compounds Impacting Soil and Water*.

For this round of the permitting process, Barr Engineering performed an air dispersion modeling analysis for hydrogen fluoride (HF) from the proposed RTO at an emission rate of 0.0886 lb/hr. This analysis is documented in Attachment B, *Air Dispersion Modeling Summary*, of C.T. Male Associates' August 1, 2019 letter. The ASA performed a review of this analysis and, in addition, augmented the analysis with the following, as requested in your 10/01/2019 Modeling Referral Form:

1) Modeled a comprehensive list of RTAPs emitted from the proposed RTO.
2) Modeled RTAPs that are emitted from the antenna coating line using modeling files submitted by Barr as a basis. Because four of these RTAPs overlap with those emitted from the proposed RTO, the ASA's modeling incorporated both the proposed RTO and the antenna coating line into a single set of model runs.
3) The ASA's modeling incorporated the emission rates from your referral form, which reflect potential to emit (PTE).

Stack parameters for the proposed RTO (reasonably likely design scenario) and the three vents that exhaust the antenna coating line are shown in Table 1 below. Table 2 shows the emission rates that were used for each RTAP as well as the maximum predicted impacts. Emission rates for the antenna coating line reflect the total emissions. For input into the modeling, the antenna coating line emission rates were divided by 3 for equal distribution among the three vents. The results in Table 2 show that maximum predicted RTAP impacts are well below their respective AALs, even at PTE emission rates.

Project Tracking and Details

- **Modeler(s):** Barr/D. Healy **Reviewer:** J. Underhill
- **Model:** AERMOD v. 19191 **Profile Base Elevation:** 229ft
- **Met data:** 18081v1_Adj.U***** (12 sector) 2013-17 **Met site:** Manchester
- **Analysis details:** Temporary permit application for RTO. Potential emission rates from 10/01/2019 Modeling Referral Form were used.

Table 1: SGPP Merrimack, Stack Parameters Used in the Modeling Analysis

Device	Stack Height (ft)	Temp (°F)	Diam. (ft)	Flow (ACFM)	Discharge
RTO	60	250	5	53,585	Vertical and Unobstructed
AV1	3	62	2.8	3,400	Horizontal
AV2	3	62	2.8	3,400	Horizontal
AV3	3	62	2.8	3,400	Horizontal

Table 2: SGPP Merrimack, Modeled RTAP Emission Rates (lb/hr) and Maximum Predicted Impacts (μg/m^3)

RTAP	Emission Rate		CAS #	24-hr Impact	24-hr AAL	Annual Impact	Annual AAL	Pass/Fail
	RTO	Ant. Coating						
Ethylene Glycol	0.937	--	107-21-1	3.75	503	0.53	335	Pass
Toluene	0.334	3.44	108-88-3	202	5,000	43	5,000	Pass
Isopropanol	0.0334	--	67-63-0	0.13	1,757	0.02	1,171	Pass
Ethanol	0.000881	--	64-17-5	0.00353	6,714	0.0005	4,476	Pass
1,4-Dioxane	0.00168	--	123-91-1	0.00673	258	0.00095	30	Pass
Benzene	0.000011	0.00008	71-43-2	0.0047	5.7	0.00099	3.8	Pass
Polyethylene Glycol	0.182	--	25322-68-3	0.73	208	0.102	99	Pass
Tetrafluoroethylene	0.302	--	116-14-3	1.21	171	0.17	81	Pass
Methanol	0.0149	--	67-56-1	0.06	20,000	0.008	20,000	Pass
MEK	0.0163	0.83	78-93-3	49	5,000	10	5,000	Pass
n-Methyl-2-Pyrrolidone	0.0142	--	872-50-4	0.06	1,429	0.008	952	Pass
Hexane	0.000869	0.11	110-54-3	6.45	885	1.36	700	Pass
APFO	0.000228	--	3825-26-1	0.00091	0.050	0.00013	0.024	Pass
Hydrogen Fluoride	0.0886	--	7664-39-3	0.35	1.5	0.05	0.98	Pass
HF (potential)	0.26	--	7664-39-3	1.04	1.5	0.15	0.98	Pass
Ammonia	0.0825	--	7664-41-7	0.33	500	0.05	500	Pass
Ethyl Acetate	--	0.04	141-78-6	2.34	10,141	0.49	4,829	Pass
Xylene	--	0.005	1330-20-7	0.29	1,550	0.06	100	Pass
Ethyl Benzene	--	0.001	100-41-4	0.053	1,000	0.011	1,000	Pass

Note: The emission rates shown above for the antenna coating line reflect the total. For input to the modeling, these emission rates were divided by 3 for equal distribution to the three vents that exhaust the antenna coating line.