

DIVISION OF AIR QUALITY

August 2, 2021

MEMORANDUM

TO: Dylan Wright, Environmental Engineer, WSRO
Davis Murphy, Permit Coordinator, WSRO

FROM: Nancy Jones, Meteorologist, Air Quality Analysis Branch (AQAB)

THROUGH: Tom Anderson, AQAB Supervisor, AQAB

SUBJECT: Corrected Review of Dispersion Modeling Analysis for Carolina Sunrock, LLC
Prospect Hill, Caswell County, NC Facility ID: 1700017

This memo corrects the results presented in the July 29, 2021 memo that had included results of a previous analysis.

I have reviewed the dispersion modeling analysis, received June 14, 2021, for the Carolina Sunrock Prospect Hill Facility in Caswell County, NC. It is an update to the original modeling that was received on December 4, 2019. The modeling was submitted as part of an application for a new quarry, asphalt plant, and truck mix concrete batch plant. The purpose for modeling was to demonstrate compliance with guidelines specified in 15A NCAC 2D .1104 for Toxic Air Pollutants (TAPs) emitted in excess of the Toxic Permitting Emission Rates (TPERs) listed in 15A NCAC 2Q .0711. The modeling adequately demonstrates compliance, on a source-by-source basis, for all toxics modeled.

Five air toxics, arsenic, benzene, formaldehyde, mercury and nickel were evaluated using AERMOD (v21112) with the 2014-2018 Danville, VA surface and Greensboro upper air meteorological data. Direction-specific building dimensions, determined using EPA's BPIP-Prime program (04274), were used as input to the model for building wake effect determination. Release parameters and emission rates are attached. Receptors were spaced 25 meters apart along the property line and spaced 100 meters apart extending out to 3,000 meters. Release parameters and emission rates are attached.

**Maximum Modeled Toxics Impacts
Carolina Sunrock Prospect Hill, Caswell County, NC**

Pollutant	Averaging Period	Max. Conc. ($\mu\text{g}/\text{m}^3$)	AAL ($\mu\text{g}/\text{m}^3$)	% of AAL
Arsenic	Annual	1.3E-4	2.1E-3	6 %
Benzene	Annual	2.34E-2	0.12	19 %
Formaldehyde	1-hour	40.49	150	27 %
Mercury	24-hour	1.62E-3	0.6	<1 %
Nickel	24-hour	3.89E-2	6	1 %

This compliance demonstration assumes the emissions scenarios, sources modeled, source parameters, and pollutant emission rates used in the dispersion modeling analysis are correct.

cc: Tom Anderson
Nancy Jones

Point Source ID	Stack Release Type	Easting (X)	Northing (Y)	Base Elevation	Stack Height	Temp.	Exit Velocity	Stack Diameter	Arsenic	Benzene	Formald.	Mercury	Nickel
		(m)	(m)	(m)	(ft)	(°F)	(fps)	(ft)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
PGEN1	DEFAULT	664513.4	4018867	200	17	960	72.24	0.49	0.00E+00	6.36E-03	7.63E-01	0.00E+00	0.00E+00
PGEN2	DEFAULT	664513.4	4018865	200	17	960	72.24	0.49	0.00E+00	6.36E-03	7.63E-01	0.00E+00	0.00E+00
PGEN3	DEFAULT	664513.4	4018863	200	17	960	72.24	0.49	0.00E+00	5.30E-03	6.36E-01	0.00E+00	0.00E+00
CD1	DEFAULT	664069.6	4018719	205	30	240	96.49	3.15	1.40E-04	9.75E-02	7.75E-01	6.50E-04	1.58E-02
ACH1	DEFAULT	664066.8	4018732	205	9	325	0.03	0.98	4.80E-06	2.36E-05	4.11E-04	3.60E-06	3.60E-06
ACH2	DEFAULT	664071.1	4018735	205	15	325	0.03	0.16	4.40E-06	2.16E-05	3.77E-04	3.30E-06	3.30E-06
HMASILO1	DEFAULT	664109.1	4018719	205	65	77	0.03	0.98	0.00E+00	1.95E-04	4.20E-03	0.00E+00	0.00E+00
HMASILO2	DEFAULT	664112	4018721	205	65	77	0.03	0.98	0.00E+00	1.95E-04	4.20E-03	0.00E+00	0.00E+00
HMASILO3	DEFAULT	664115	4018724	205	60	77	0.03	0.98	0.00E+00	1.95E-04	4.20E-03	0.00E+00	0.00E+00
HMASILO4	DEFAULT	664117.9	4018726	205	60	77	0.03	0.98	0.00E+00	1.95E-04	4.20E-03	0.00E+00	0.00E+00
HMASILO5	DEFAULT	664106.1	4018717	205	60	77	0.03	0.98	0.00E+00	1.95E-04	4.20E-03	0.00E+00	0.00E+00
CD2	DEFAULT	664155.2	4018787	202	35	77	79.99	1.51	6.59E-05	0.00E+00	0.00E+00	0.00E+00	1.92E-04
GEN1	DEFAULT	664799	4018997	184	12	975	95.51	0.49	9.80E-06	2.29E-03	2.89E-03	7.35E-06	7.35E-06
GEN1A	DEFAULT	665011.6	4019023	184	12	975	95.51	0.49	9.80E-06	2.29E-03	2.89E-03	7.35E-06	7.35E-06
GEN2	DEFAULT	664851.9	4019087	184	12	975	95.51	0.49	3.50E-06	8.17E-04	1.03E-03	2.63E-06	2.63E-06
GEN3	DEFAULT	664603.3	4018929	200	12	975	95.51	0.49	1.23E-05	2.87E-03	3.63E-03	9.24E-06	9.24E-06
GEN4	HORIZONTAL	665147.8	4019020	184	6	942	49.44	0.49	3.50E-06	8.17E-04	1.03E-03	2.63E-06	2.63E-06
GEN5	DEFAULT	664608.9	4018938	200	12	975	95.51	0.49	1.26E-05	2.94E-03	3.72E-03	9.45E-06	9.45E-06
GEN7	DEFAULT	664585.2	4018949	201	12	975	95.51	0.49	9.80E-06	2.29E-03	2.89E-03	7.35E-06	7.35E-06

Volume Source ID	Easting (X)	Northing (Y)	Base Elevation	Release Height	Init. Hor. Dimen.	Init. Vert. Dimen.	Arsenic	Benzene	Formald.	Mercury	Nickel
	(m)	(m)	(m)	(ft)	(ft)	(ft)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
HMALO1	664109.1	4018719	205	12	0.49	5.58	0.00E+00	1.08E-04	1.83E-04	0.00E+00	0.00E+00
HMALO2	664112	4018721	205	12	0.49	5.58	0.00E+00	1.08E-04	1.83E-04	0.00E+00	0.00E+00
HMALO3	664115	4018724	205	12	0.49	5.58	0.00E+00	1.08E-04	1.83E-04	0.00E+00	0.00E+00
HMALO4	664117.9	4018726	205	12	0.49	5.58	0.00E+00	1.08E-04	1.83E-04	0.00E+00	0.00E+00
HMALO5	664106.1	4018717	205	12	0.49	5.58	0.00E+00	1.08E-04	1.83E-04	0.00E+00	0.00E+00