DIVISION OF AIR QUALITY
March 23, 2021

MEMORANDUM

TO: Davis Murphy, Permit Coordinator, WSRO
Ray Stewart, Regional Supervisor, WSRO

FROM: Matthew Porter, Meteorologist, AQAB

THROUGH: Tom Anderson, AQAB Supervisor

SUBJECT: Sitewide NAAQS Dispersion Modeling Analysis for Carolina Sunrock, LLC – Burlington
Facility ID: 1700016
Burlington, NC Caswell County

I have completed my review of the sitewide NAAQS dispersion modeling analysis received March 2, 2021, and revised March 10, 2021, for the combination hot mix asphalt (HMA) plant and concrete batch plant facility that will be owned and operated by Carolina Sunrock, LLC located in Burlington, Caswell County, NC. The initial modeling analysis demonstration received March 2, 2021 was revised and then re-submitted on March 10, 2021 to address comments on the representation of area-line sources and worst-case daily emissions for fugitive particulate matter from paved and unpaved haul roads. The dispersion modeling analysis was conducted to evaluate the combined criteria air pollutant ambient impacts from all operations located at the site, which included emissions from the proposed construction and operation of a hot mix asphalt plant and concrete batch plant. Sitewide criteria pollutants including particulate matter (TSP, $PM_{2.5}$ and PM_{10}), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2) were modeled for comparison with the National Ambient Air Quality Standards (NAAQS). Ultimately, the sitewide dispersion modeling analysis of criteria air pollutant emissions adequately demonstrated compliance with the NAAQS, on a source-by-source basis.

Model Selection

AERMOD (version 19191) was selected as the most appropriate dispersion model for the modeling analysis. AERMOD is currently the preferred regulatory dispersion model by the U.S. EPA for evaluating air pollutant impacts from industrial facilities. [1] The AERMOD modeling system has undergone nearly 20 years of performance evaluation studies and model coding refinements during which time NC DAQ and permit applicants have relied on this modeling system for compliance demonstrations under the NAAQS programs at small, synthetic minor, and major Title V industrial sources of air pollution in all regions of North Carolina from the mountains to the coastal plain. The AERMOD modeling system includes preprocessors for meteorology inputs (AERMET version 19191 and AERMINUTE version 15272) and complex terrain inputs (AERMAP version 18081). The performance evaluation studies have shown that AERMOD predictions of ambient air pollution impacts from various source release types

[1] See preferred models in Appendix A to Appendix W of 40 CFR Part 51. Modeling system details: https://www.epa.gov/scram/air-quality-dispersion-modeling-preferred-and-recommended-models

(point~~s~~, volume~~s~~, and area sources) are within acceptable performance ranges for model precision and model bias.[2] AERMOD was designed to simulate steady-state gaussian-shaped plume dispersion under convective, stable, and neutral boundary layer conditions in flat and complex terrain (i.e., above stack height) environments. As such, the acceptable performance model evaluations from EPA and design features of the AERMOD modeling system support selection of AERMOD for the sitewide NAAQS modeling demonstrations at the Carolina Sunrock facility.

Meteorology Selection

AERMET (version 18081) was used to process the 2014-2018 Burlington Airport surface and Greensboro upper air data to generate vertical meteorological and atmospheric turbulence profiles for hourly AERMOD dispersion modeling calculations. The AERMET processing utilized the adjusted friction velocity (ADJ_U*) option to address AERMOD model performance improvements for stable, low-wind controlling conditions. The AERMET processing was conducted by NC DAQ and emailed to the applicant.

Terrain Data and Receptor Grids

Receptors were modeled around the property boundary at 25-meter intervals. Two receptor grids were modeled beyond the facility property with the first extending 2 km with 100-meter receptor spacing, and second grid extending 2-3 km with 200-meter spacing. In all, a total of 1,769 receptors were modeled. Building, source, and receptor elevations and receptor dividing streamline heights were calculated from 1-arc-second resolution (30-meter) USGS NED terrain data using the AERMOD terrain pre-processor AERMAP (version 18081). All modeled buildings, sources, and receptors were geo-located within the modeling domain based on the horizontal North American Datum of 1983 (NAD83) and Zone 17 of the Universal Transverse Mercator (UTM) coordinate system.

Building Downwash

Direction-specific building downwash parameters, calculated using EPA's BPIP-PRIME program (04274), were used as input to AERMOD to determine the effects of building downwash on plume rise and the entrainment of stack emissions into the cavity and turbulent wake zones downwind of buildings at the facility. The building downwash analysis included 23 buildings and 13 point sources.

Sitewide Modeling for NO_2 and SO_2

The sitewide modeling demonstration for the NO_2 and SO_2 NAAQS included three combustion point sources from the proposed new hot mix asphalt plant and concrete plant. Point source parameters are provided in the attached Table A1. Sitewide modeled NO_2 and SO_2 emission rates are provided in attached Table A2. All emission rates were conservatively modeled 8,760 hours per year.

The 1-hour NO_2 NAAQS modeling demonstration relied on the EPA Tier 2 regulatory option,

[2] AERMOD Model Formulation and Evaluation. August 2019. EPA-454/R-19-014. See: https://gaftp.epa.gov/Air/aqmg/SCRAM/models/preferred/aermod/aermod_mfed.pdf

Ambient Ratio Method Version 2 (ARM2) regulatory option in AERMOD.[3] The ARM2 option simulates the atmospheric chemistry conversion of NO_X to ambient NO_2 based on polynomial correlations developed from data taken from EPA's Air Quality System.[4] The ARM2 regulatory option is recommended as a Tier 2 approach in Section 4.2.3.4 of Appendix W to 40 CFR Part 51.

Maximum modeled impacts for NO_2 and SO_2 are provided in Table 1. NO_2 background concentrations were based on 2015-2017 data collected at the NC DAQ Blackstone site located in Lee County. The Blackstone NO_2 concentrations were considered representative of the Prospect Hill location based on similarities in rural locale and traffic patterns. SO_2 background concentrations were conservatively based on 2017-2019 data from the Person County DRR site located near Roxboro.

Table 1.
Maximum NO_2 and SO_2 Impacts from Sitewide Emissions
Carolina Sunrock, LLC, Burlington, NC

Pollutant	Avg. Period	NAAQS (µg/m3)	Background Concentration (µg/m3)	Modeled Impact (µg/m3)	Total Impact (µg/m3)	% of NAAQS
SO_2	1-hour	196	83.8	39.87	123.67	63%
NO_2	1-hour	188	15.3	129.73	145.03	77%

Sitewide Modeling for TSP, PM_{10}, and $PM_{2.5}$

The sitewide modeling demonstration for the TSP, $PM_{2.5}$ and PM_{10} NAAQS included 23 point sources, 13 volume sources, two rectangular area sources, and two polygon-shaped area sources from the proposed new asphalt plant and concrete batch plant. Point and volume source parameters are provided in the attached Tables A1 and A3, respectively. Rectangular area source parameters are provided in the attached Table A4. Polygon-shaped area source parameters are provided in attached Table A5. Sitewide modeled TSP, PM_{10} and $PM_{2.5}$ emission rates are provided in attached Table A6.

Ten operating scenarios were modeled involving different combinations of the five possible HMA loadout sources. Only two of the five HMA loadout sources were modeled together using source grouping to represent the plant design limit of two loadout systems operating at any one time. Source groupings modeled under each scenario are provided in Table A7.

In general, the annual TSP and $PM_{2.5}$ demonstrations assumed hourly emissions based on annual limits from all sources modeled for 8,760 hours per year. The 24-hour TSP, $PM_{2.5}$, and PM_{10} demonstrations included various assumptions as indicated in Appendix A of the revised Carolina Sunrock modeling report received March 10, 2021.

[3] Ambient Ratio Method Version (ARM2) for use with AERMOD for 1-hr NO_2 Modeling. September 20, 2013. See:
https://gaftp.epa.gov/Air/aqmg/SCRAM/models/preferred/aermod/ARM2_Development_and_Evaluation_Report-September_20_2013.pdf
[4] Podrez, M. 2015. An Update to the Ambient Ratio Method for 1-hr NO_2 Air Quality Standards Dispersion Modeling. Atmospheric Environment, 103: 163–170.

The TSP, PM_{10}, and $PM_{2.5}$ sitewide emission inventory includes combustion sources and fugitive emissions from crushing, screening, conveyors, material transfers, material handling, trucking and loader traffic on unpaved and paved roads, and wind erosion from sorted and unsorted aggregate stock piles. Fugitive emission source parameters and model emissions methodologies were taken from NC DAQ, EPA, and applicable nationally available guidance documents. [5, 6, 7, 8,]

Sitewide modeled impacts for 24hr and annual TSP, $PM_{2.5}$, and 24hr PM_{10} are provided in Table 2. PM_{10} and $PM_{2.5}$ background concentrations were based on 2017-2019 data from the Guilford County monitoring site. Background concentrations for TSP were not required to assess total source impacts per NC DAQ modeling guidance. Note there was no discernable difference between operating scenarios in terms of determining the worst-case ambient impacts for TSP, PM_{10}, and $PM_{2.5}$.

Table 2.
Maximum Modeled TSP, PM_{10}, and $PM_{2.5}$ Impacts from Sitewide Emissions
Carolina Sunrock, LLC, Burlington, NC

Pollutant	Avg. Period	NAAQS (µg/m3)	Background Concentration (µg/m3)	Modeled Impact (µg/m3)	Total Impact (µg/m3)	% of NAAQS
TSP	24-hour	150	--	145.32	145.32	97%
	Annual	75	--	27.36	27.36	36%
PM_{10}	24-hour	150	17	54.48	71.48	48%
$PM_{2.5}$	24-hour	35	15	8.80	23.80	68%
	Annual	12	7.3	1.35	8.65	72%

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

cc: Tom Anderson
Michael Pjetraj
Michael Abraczinskas
Asher Spiller

[5] https://files.nc.gov/ncdeq/Air Quality/permits/mets/NC_DAQ_Quarry_Modeling_Guidance_31May2018.pdf
[6] Haul Road Workgroup Final Report Submission to EPA-OAQPS. March 2, 2012. U.S. EPA. See: https://gaftp.epa.gov/Air/aqmg/SCRAM/conferences/2012_10th_Conference_On_Air_Quality_Modeling/Review_Material/Haul_Road_Workgroup-Final_Report_Package-20120302.pdf
[7] WRAP Fugitive Dust Handbook. September 7, 2006. Western Regional Air Partnership (WRAP). See: https://www.wrapair.org/forums/dejf/fdh/content/FDHandbook_Rev_06.pdf
[8] Air/Superfund National Technical Guidance Study Series; Volume III – Estimation of Air Emissions from Cleanup Activities at Superfund Sites, Interim final report EPA-450/1-89-003. January 1989. U.S. EPA

Table A1. Modeled Release Parameters for Point Sources

MODEL ID	Description	X-Utm (m)	Y-Utm (m)	Elevation (m)	Stack Height (m)	Temp. (K)	Velocity (m/s)	Stack Diameter (m)	CAPped or HORizontal Release?
CD_1	Asphalt Plant Baghouse	650207.90	4013086.90	201.30	14.02	388.71	29.41	0.94	NO
CD_2	Concrete Plant Baghouse	650222.30	4013030.40	202.80	12.19	293.15	24.38	0.46	NO
ESH_2	Liquid Asphalt Heater	650203.80	4013069.40	201.60	2.74	435.93	0.01	0.30	NO
ESH_1	Asphalt Heater	650190.20	4013088.30	200.40	4.57	435.93	0.01	0.06	NO
HMASILO4	HMA Silo #4	650184.00	4013068.50	200.70	19.81	293.15	0.01	0.30	NO
HMASILO3	HMA Silo #3	650185.70	4013065.10	200.90	19.81	293.15	0.01	0.30	NO
HMASILO1	HMA Silo #1	650187.60	4013061.80	201.00	19.81	293.15	0.01	0.30	NO
HMASILO2	HMA Silo #2	650189.40	4013058.30	201.00	19.81	293.15	0.01	0.30	NO
HMASILO5	HMA Silo #5	650191.10	4013054.70	201.00	19.81	293.15	0.01	0.30	NO
SYP1DP	Truck Loadout to Pile	650271.70	4013104.30	204.60	4.27	293.15	0.01	0.30	NO
SYP2DP	Truck Loadout to Pile	650295.60	4013021.90	206.20	4.27	293.15	0.01	0.30	NO
RMC_CNV1	Drop from Weight Batcher to Truck	650232.90	4013014.10	202.70	0.91	293.15	0.01	0.91	NO
RMC_CNV2	Drop from Feeder	650260.10	4013024.90	204.80	0.91	293.15	0.01	0.91	NO

Table A2. NO_2 and SO_2 Modeled Hourly Emission Rates (lb/hr)

MODEL ID	Type	Description	NO_2	SO_2
CD_1	POINT	Asphalt Plant Baghouse	1.392E+01	2.154E+01
ESH_2	POINT	Liquid Asphalt Heater	1.571E-01	1.674E-03
ESH_1	POINT	Asphalt Heater	1.714E-01	1.825E-03

Table A3. Modeled Release Parameters for Volume Sources

Model ID	Source Description	X-Utm (m)	Y-Utm (m)	Elevation (m)	Release Height (m)	Init. Sigma-Y (m)	Init. Sigma-Z (m)	Drop Height AGL (m)	Drop Distance (m)
RM5	Aggregate Weigh Batcher	650231.20	4013023.90	203.10	7.32	0.18	0.64	10.98	1.38
HMALO4	HMA Loadout #4	650184.00	4013068.50	200.70	3.66	0.15	1.70	5.49	3.66
HMALO3	HMA Loadout #3	650185.70	4013065.10	200.90	3.66	0.15	1.70	5.49	3.66
HMALO1	HMA Loadout #1	650187.60	4013061.80	201.00	3.66	0.15	1.70	5.49	3.66
HMALO2	HMA Loadout #2	650189.40	4013058.30	201.00	3.66	0.15	1.70	5.49	3.66
HMALO5	HMA Loadout #5	650191.10	4013054.70	201.00	3.66	0.15	1.70	5.49	3.66
RAP_CRSH	RAP Crusher	650236.90	4013079.60	203.70	2.14	0.43	1.98	3.21	4.26
DP2	Drop from Crusher	650234.90	4013080.60	203.50	2.44	0.18	0.28	3.66	0.60
DP3	Transfer to Screen Conveyor	650221.30	4013085.40	202.40	2.44	0.18	0.07	3.66	0.15
DP4	Drop from Screen to Drum Conveyor	650226.60	4013071.40	203.10	4.04	0.18	0.43	6.06	0.92
RAP_SCN	Double Deck Screen	650226.60	4013071.40	203.10	2.90	0.72	2.69	4.35	5.78
DP1	Drop from Feed Bins to Crusher Conveyor	650246.70	4013072.90	204.60	0.68	0.18	0.64	1.02	1.38
DP5	Drop to Drum	650213.70	4013064.80	202.30	7.92	0.18	0.07	11.88	0.15

Table A4. Modeled Release Parameters for Rectangular Area Sources

Model ID	Source Description	Easting (X)	Northing (Y)	Base Elevation	Release Height	Easterly Length	Northerly Length	Angle from North	Initial Vert. Dimension	Area
		(m)	(m)	(m)	(m)	(m)	(m)	(degs)	(m)	(acres)
SYP1	HMA Storage Pile	650242.80	4013108.30	202.90	2.13	60.96	22.86	10	1.98	0.34434
SYP2	Concrete Storage Pile	650272.80	4013003.90	203.80	2.13	22.86	60.96	50	1.98	0.34434

Table A5. Modeled Release Parameters for Polygon-Shaped Area Sources

Model ID	Source Description	X-utm	Y-utm	Elev.	Release Ht.	Number of Vertices	Initial Vert. Dimension	Area
		(m)	(m)	(m)	(m)	(#)	(m)	(acres)
PAVEDRDS	Paved Road Areas	650217.50	4012767.80	207.80	3.60	23	3.40	4.380
UNPVDRDS	Unpaved Areas	650235.80	4013014.30	202.90	3.60	9	3.40	1.832

Table A6. TSP, PM_{10}, and $PM_{2.5}$ Modeled Hourly Emission Rates (lb/hr)

Model ID	Type	Source Description	TSP	PM_{10}	$PM_{2.5}$ (24-hour)	PM2.5 (Annual)
CD_1	POINT	Asphalt Plant Baghouse	1.392E+01	2.154E+01	8.254E+00	5.750E+00
CD_2	POINT	Concrete Plant Baghouse	0.000E+00	0.000E+00	1.107E+00	4.280E-01
ESH_2	POINT	Liquid Asphalt Heater	1.571E-01	1.674E-03	2.593E-02	2.600E-02
ESH_1	POINT	Asphalt Heater	1.714E-01	1.825E-03	2.829E-02	2.800E-02
HMASILO4	POINT	HMA Silo #4	0.000E+00	0.000E+00	2.929E-02	2.929E-02
HMASILO3	POINT	HMA Silo #3	0.000E+00	0.000E+00	2.929E-02	2.929E-02
HMASILO1	POINT	HMA Silo #1	0.000E+00	0.000E+00	2.929E-02	2.929E-02
HMASILO2	POINT	HMA Silo #2	0.000E+00	0.000E+00	2.929E-02	2.929E-02
HMASILO5	POINT	HMA Silo #5	0.000E+00	0.000E+00	2.929E-02	2.929E-02
SYP1DP	POINT	Truck Loadout to Pile	0.000E+00	0.000E+00	2.221E-01	1.050E-01
SYP2DP	POINT	Truck Loadout to Pile	0.000E+00	0.000E+00	1.867E-01	8.825E-02
RMC_CNV1	POINT	Drop from Weight Batcher to Truck	0.000E+00	0.000E+00	1.867E-01	8.825E-02
RMC_CNV2	POINT	Drop from Feeder	0.000E+00	0.000E+00	1.867E-01	8.825E-02
RM5	VOLUME	Aggregate Weigh Batcher	0.000E+00	0.000E+00	9.849E-01	5.745E-01
HMALO4	VOLUME	HMA Loadout #4	0.000E+00	0.000E+00	2.610E-02	2.610E-02
HMALO3	VOLUME	HMA Loadout #3	0.000E+00	0.000E+00	2.610E-02	2.610E-02
HMALO1	VOLUME	HMA Loadout #1	0.000E+00	0.000E+00	2.610E-02	2.610E-02

Model ID	Type	Source Description	TSP	PM_{10}	$PM_{2.5}$ (24-hour)	PM2.5 (Annual)
HMALO2	VOLUME	HMA Loadout #2	0.000E+00	0.000E+00	2.610E-02	2.610E-02
HMALO5	VOLUME	HMA Loadout #5	0.000E+00	0.000E+00	2.610E-02	2.610E-02
RAP_CRSH	VOLUME	RAP Crusher	0.000E+00	0.000E+00	3.510E-01	1.560E-01
DP2	VOLUME	Drop from Crusher	0.000E+00	0.000E+00	1.950E-01	7.150E-02
DP3	VOLUME	Transfer to Screen Conveyor	0.000E+00	0.000E+00	1.950E-01	7.150E-02
DP4	VOLUME	Drop from Screen to Drum Conveyor	0.000E+00	0.000E+00	1.950E-01	7.150E-02
RAP_SCN	VOLUME	Double Deck Screen	0.000E+00	0.000E+00	1.625E+00	5.655E-01
DP1	VOLUME	Drop from Feed Bins to Crusher Conveyor	0.000E+00	0.000E+00	1.950E-01	7.150E-02
DP5	VOLUME	Drop to Drum	0.000E+00	0.000E+00	1.950E-01	7.150E-02
SYP1	AREA	HMA Storage Pile	0.000E+00	0.000E+00	6.612E-03	3.306E-03
SYP2	AREA	Concrete Storage Pile	0.000E+00	0.000E+00	6.612E-03	3.306E-03
PAVEDRDS	AREAPOLY	Paved Road Areas	0.000E+00	0.000E+00	8.271E-01	1.654E-01
UNPVDRDS	AREAPOLY	Unpaved Areas	0.000E+00	0.000E+00	6.288E-01	1.733E-01

Table A7. TSP, PM_{10}, and $PM_{2.5}$ Operating Scenarios and Source Groups

		Ten Operating Scenarios for Two HMA Loadouts Per Scenario Represented by Modeled Source Groupings									
Model ID	**Type**	**ALLHMA 12**	**ALLHMA 13**	**ALLHMA 14**	**ALLHMA 15**	**ALLHMA 23**	**ALLHMA 24**	**ALLHMA 25**	**ALLHMA 34**	**ALLHMA 35**	**ALLHMA 45**
CD_1	POINT	CD_1	CD_1	CD_1	CD_1	CD_1	CD_1	CD_1	CD_1	CD_1	CD_1
CD_2	POINT	CD_2	CD_2	CD_2	CD_2	CD_2	CD_2	CD_2	CD_2	CD_2	CD_2
ESH_2	POINT	ESH_2	ESH_2	ESH_2	ESH_2	ESH_2	ESH_2	ESH_2	ESH_2	ESH_2	ESH_2
ESH_1	POINT	ESH_1	ESH_1	ESH_1	ESH_1	ESH_1	ESH_1	ESH_1	ESH_1	ESH_1	ESH_1
RM5	POINT	RM5	RM5	RM5	RM5	RM5	RM5	RM5	RM5	RM5	RM5
HMASILO 4	POINT	HMASILO 4	HMASILO 4	HMASILO 4	HMASILO 4	HMASILO 4	HMASILO 4	HMASILO 4	HMASILO 4	HMASILO 4	HMASILO 4
HMASILO 3	POINT	HMASILO 3	HMASILO 3	HMASILO 3	HMASILO 3	HMASILO 3	HMASILO 3	HMASILO 3	HMASILO 3	HMASILO 3	HMASILO 3

Model ID	Type	Ten Operating Scenarios for Two HMA Loadouts Per Scenario Represented by Modeled Source Groupings									
		ALLHMA12	**ALLHMA13**	**ALLHMA14**	**ALLHMA15**	**ALLHMA23**	**ALLHMA24**	**ALLHMA25**	**ALLHMA34**	**ALLHMA35**	**ALLHMA45**
HMASILO1	POINT	HMASILO1	HMASILO1	HMASILO1	HMASILO1	HMASILO1	HMASILO1	HMASILO1	HMASILO1	HMASILO1	HMASILO1
HMASILO2	POINT	HMASILO2	HMASILO2	HMASILO2	HMASILO2	HMASILO2	HMASILO2	HMASILO2	HMASILO2	HMASILO2	HMASILO2
HMASILO5	POINT	HMASILO5	HMASILO5	HMASILO5	HMASILO5	HMASILO5	HMASILO5	HMASILO5	HMASILO5	HMASILO5	HMASILO5
HMALO4	POINT	****	****	HMALO4	****	****	HMALO4	****	HMALO4	****	HMALO4
HMALO3	POINT	****	HMALO3	****	****	HMALO3	****	****	HMALO3	HMALO3	****
HMALO1	POINT	HMALO1	HMALO1	HMALO1	HMALO1	****	****	****	****	****	****
HMALO2	VOLUME	HMALO2	****	****	****	HMALO2	HMALO2	HMALO2	****	****	****
HMALO5	VOLUME	****	****	****	HMALO5	****	****	HMALO5	****	HMALO5	HMALO5
RAP_CRSH	VOLUME	RAP_CRSH	RAP_CRSH	RAP_CRSH	RAP_CRSH	RAP_CRSH	RAP_CRSH	RAP_CRSH	RAP_CRSH	RAP_CRSH	RAP_CRSH
DP2	VOLUME	DP2	DP2	DP2	DP2	DP2	DP2	DP2	DP2	DP2	DP2
DP3	VOLUME	DP3	DP3	DP3	DP3	DP3	DP3	DP3	DP3	DP3	DP3
DP4	VOLUME	DP4	DP4	DP4	DP4	DP4	DP4	DP4	DP4	DP4	DP4
RAP_SCN	VOLUME	RAP_SCN	RAP_SCN	RAP_SCN	RAP_SCN	RAP_SCN	RAP_SCN	RAP_SCN	RAP_SCN	RAP_SCN	RAP_SCN
SYP1	VOLUME	SYP1	SYP1	SYP1	SYP1	SYP1	SYP1	SYP1	SYP1	SYP1	SYP1
SYP2	VOLUME	SYP2	SYP2	SYP2	SYP2	SYP2	SYP2	SYP2	SYP2	SYP2	SYP2
SYP1DP	VOLUME	SYP1DP	SYP1DP	SYP1DP	SYP1DP	SYP1DP	SYP1DP	SYP1DP	SYP1DP	SYP1DP	SYP1DP
SYP2DP	VOLUME	SYP2DP	SYP2DP	SYP2DP	SYP2DP	SYP2DP	SYP2DP	SYP2DP	SYP2DP	SYP2DP	SYP2DP
PAVEDRDS	VOLUME	PAVEDRDS	PAVEDRDS	PAVEDRDS	PAVEDRDS	PAVEDRDS	PAVEDRDS	PAVEDRDS	PAVEDRDS	PAVEDRDS	PAVEDRDS
UNPVDRDS	VOLUME	UNPVDRDS	UNPVDRDS	UNPVDRDS	UNPVDRDS	UNPVDRDS	UNPVDRDS	UNPVDRDS	UNPVDRDS	UNPVDRDS	UNPVDRDS
RMC_CNV1	AREA	RMC_CNV1	RMC_CNV1	RMC_CNV1	RMC_CNV1	RMC_CNV1	RMC_CNV1	RMC_CNV1	RMC_CNV1	RMC_CNV1	RMC_CNV1
RMC_CNV2	AREA	RMC_CNV2	RMC_CNV2	RMC_CNV2	RMC_CNV2	RMC_CNV2	RMC_CNV2	RMC_CNV2	RMC_CNV2	RMC_CNV2	RMC_CNV2
DP1	AREAPOLY	DP1	DP1	DP1	DP1	DP1	DP1	DP1	DP1	DP1	DP1

Model ID	Type	Ten Operating Scenarios for Two HMA Loadouts Per Scenario Represented by Modeled Source Groupings									
		ALLHMA 12	ALLHMA 13	ALLHMA 14	ALLHMA 15	ALLHMA 23	ALLHMA 24	ALLHMA 25	ALLHMA 34	ALLHMA 35	ALLHMA 45
DP5	AREAPOLY	DP5	DP5	DP5	DP5	DP5	DP5	DP5	DP5	DP5	DP5

Note: Sources excluded from an operating scenario and source grouping shown as '****'.