Base Year 2017 Meteorology Data

(2015 Ozone NAAQS)

Methodology

Meteorology data was developed for the base year 2017 for MOVES2014b on-road and nonroad emissions analyses for the 2015 ozone NAAQS using data from the Dulles airport.

The Technical Guidance document for MOVES2014/MOVES2014a/MOVES2014b models provides guidance for the meteorological data for SIP purposes (EPA-420-B-18-039, August 2018). It recommends using local meteorological data for SIP purposes. For the ozone season day analysis, the document recommends using data for July or for the three-month period that best represents the area's ozone season (typically June-August or July-September) in Section 4.2, page 34 and Section 5.2.1, page 63.

For an average ozone season work weekday analysis for the base year 2017 for on-road and nonroad sources, hourly average meteorology data was developed for the month of July. MOVES2014b will be run for July 2017 using this meteorological data to develop both on-road nonroad emissions inventories for the base year 2017. This is consistent with the approach previously used to develop on-road emissions inventories for the redesignation request and maintenance plan for the 2008 ozone NAAQS.

Hourly average Dry Bulb Temperature (DBT) and Dew Point Temperature (DPT) data for July 2017 were acquired for the Dulles airport from the National Climate Data Center (NCDC) web-site of the National Oceanographic & Atmospheric Administration (NOAA) located at https://www.ncdc.noaa.gov/IPS/lcd/lcd.html. Hourly average Relative Humidity data (RH) were calculated using these two parameters using following equations:

$RH = e/es * (100\%)$

$e = es0 * \exp (lv/Rv * (1/T0 - 1/Td))$
$es = es0 * \exp (lv/Rv * (1/T0 - 1/T))$
$es0$ = Reference saturation vapor pressure (es at a certain temp, usually 0 deg C) = .611 hPa
$T0$ = Reference temperature (273.15 Kelvin, Kelvin = degree C + 273.15)
Td = Dew point temperature (Kelvin)
T = Temperature (Kelvin)
lv = Latent heat of vaporization of water ($2.5 * 10^6$ joules per kilogram)
Rv = Gas constant for water vapor (461.5 joules* Kelvin / kilogram)

Base Year Meteorological Data (July 2017, IAD) - MOVES2014b Format

monthID	zoneID	HourID	temperature	relHumidity
7	110010	1	72.0	84.0
7	110010	2	71.0	84.0
7	110010	3	71.0	84.0
7	110010	4	70.0	86.9
7	110010	5	70.0	83.9
7	110010	6	71.0	84.0
7	110010	7	74.0	78.4
7	110010	8	77.0	68.3
7	110010	9	79.0	63.9
7	110010	10	81.0	59.7
7	110010	11	83.0	55.9
7	110010	12	84.0	54.1
7	110010	13	85.0	52.3
7	110010	14	85.0	52.3
7	110010	15	85.0	52.3
7	110010	16	85.0	52.3
7	110010	17	84.0	52.2
7	110010	18	83.0	54.0
7	110010	19	80.0	61.8
7	110010	20	77.0	70.8
7	110010	21	76.0	73.2
7	110010	22	75.0	73.2
7	110010	23	74.0	75.7
7	110010	24	73.0	81.2

Base Year Meteorology Data (July 2017) - Dulles Airport