MEMORANDUM

September 10, 2013

To: MWAQC Technical Advisory Committee

From: Sunil Kumar
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Subject: Selection of base year for 2008 ozone NAAQS (75 ppb)

EPA designated the Washington region as "Marginal" nonattainment area for the 2008 8-hour ozone National Ambient Air Quality Standard (NAAQS). The region needs to attain the standard by December 31, 2015 failing which it will be reclassified as "Moderate" ozone nonattainment area.

Need for Base Year Inventory

A base year inventory is required for the following two purposes:

1. To meet base year emissions inventory submission requirement for Marginal nonattainment area for the 2008 ozone standard (75 ppb) – Due July 20, 2014.
2. To develop Reasonable Further Progress (RFP) plan for possible Moderate nonattainment reclassification – Due to EPA shortly after reclassification (expected by June 2016). State air agencies decided to develop the plan in FY2014 in preparation for a possible higher reclassification to the Moderate nonattainment area. Emissions need to be reduced by 15% (using either VOC or NOx or a combination of both) between the base year and the RFP milestone year (6 years from the base year) in order to meet the RFP requirements.

Selection of Base Year

In July the Emissions Inventory Sub-Committee discussed various issues regarding the selection of a base year. Specifically, the committee focused on two years namely, 2007 and 2011. The Emissions Inventory Subcommittee discussed the following issues: current availability of the two inventories, emissions development needs to fill in the gaps, implications for RFP emissions reductions, need to align with the national Emissions Inventory (NEI) submission cycle, and the relationship with the Ozone Transport Commission's (OTC) ongoing photochemical modeling efforts. The committee recommended that MWAQC staff compile a base year inventory for 2011 and a RFP milestone year inventory for 2017 using the existing information provided by the state air agencies from their NEI2011 efforts and Mid-Atlantic Regional Air Management Association (MARAMA) and COG inventories respectively.

Following the committee's recommendation, MWAQC staff compiled annual VOC and NOx inventories for 2011 and 2017 and performed calculations for the emissions reduction between the two years to evaluate if the region can meet the 15% RFP requirements. Average ozone season day inventories are required for the ozone SIP purposes. However, MWAQC staff compiled and used annual inventories for this analysis because no ozone season day inventories were available for the two

milestone years except for the ozone season day onroad inventories for 2017 (FY2013 Transportation Conformity Report). Also, since MARAMA did not have annual inventories for Calvert County in Maryland, which is part of the Washington, DC-MD-VA 2008 ozone NAAQS nonattainment area, Calvert County was not included in this analysis.

Another important limitation of this analysis is that the actual 2011 base year inventories and not the adjusted 2011 RFP base year inventories, which are the basis for calculating emissions reductions between 2011 and 2017 to meet the 15% RFP emission reduction requirements, were used. The adjusted 2011 RFP base year inventories are developed by excluding the emission benefits from the pre-1990 controls that would occur between 2011 and 2017. Calculation of emissions benefits from the pre-1990 controls requires several time-intensive MOVES runs and they are also not very significant now as a very small percentage of pre-1990 vehicle fleet is still operating in the region (EPA's proposed 2008 ozone standard implementation rule, June 6, 2013).

The limitations in compiling the needed inventories should be taken into consideration while interpreting the results of this analysis. Emissions inventories for the two years for NOx and VOC are presented in Table 1 and Table 2 respectively. The 15% RFP emissions reductions calculations are shown in Table 3.

Conclusion & Recommendation

Based on the calculations shown in Table 2, the Washington region is able to reduce the combined annual emissions of VOC and NOx by 15.1% during the period 2011 through 2017. Therefore, it seems likely that the Washington region can also meet the 15% emissions reduction requirements on the average ozone season day basis using a combination of both VOC and NOx if the year 2011 is chosen as the base year.

Table 1

NOx (Tons per year)

Jurisdiction	Area		Point (EGU+NEGU)		NMIM		MAR		MOVES		Total		Percentage Emission Reduction (2011-2017)
	2011	2017	2011	2017	2011	2017	2011	2017	2011	2017	2011	2017	
Washington	1748	1,560	934	779	2364	1534	5	357	5464	2726	10,515	6,958	
Charles	225	311	1,421	5099	731	499	30	37	1,914	1583	4,322	7,529	
Frederick	398	313	91	4360	1,518	707	454	520	4,550	3951	7,011	9,851	
Montgomery	1,557	1,499	2,618	3308	3,071	1837	350	314	11,368	6608	18,964	13,566	
Prince Georges	1,266	1,308	5,023	4564	2,853	1596	427	573	12,626	8430	22,195	16,470	
Arlington	402	409	17	40	1085	680	1338	1402	1,289	896	4,131	3,426	
Fairfax	1,955	2,059	1,982	2394	2904	1943	212	188	9,028	7587	16,082	14,171	
Loudoun	532	531	109	155	2105	1378	1899	2684	2,203	2693	6,848	7,441	
Prince William	585	546	654	1309	1390	917	214	165	4,231	3709	7,074	6,646	
Alexandria	275	290	1,041	2692	127	86	70	60	750	709	2,262	3,836	
Fairfax City	52	54	6	7	50	36			182		290	97	
Falls Curch	26	27			26	19			81		134	47	
Manassas	76	79	11	130	61	36	16	12	348		511	257	
Manassas Park	20	22			26	19	1	1	62		109	42	
Total	9,118	9,009	13,907	24,837	18,311	11,286	5,016	6,313	54,095	38,892	**100,446**	**90,336**	**10.1**

Table 2

VOC (Tons per year)

Jurisdiction	Area		Point (EGU+NEGU)		NMIM		MAR		MOVES		Total		Percentage Emission Reduction (2011-2017)
	2011	2017	2011	2017	2011	2017	2011	2017	2011	2017	2011	2017	
Washington	4982	4,912	103	59	1250	749	0.4	23	1924	1472	8,259	7,216	
Charles	1,233	1,472	103	61	1,074	602	14	14	915	810	3,338	2,958	
Frederick	2,134	2,679	120	330	1,238	902	68	71	1,652	1448	5,213	5,430	
Montgomery	7,481	8,397	45	46	3,892	3065	28	29	5,466	3178	16,912	14,715	
Prince Georges	6,542	7,514	195	414	2,505	1840	82	91	5,038	3474	14,361	13,333	
Arlington	2,109	2,417	2	106	438	291	208	228	786	538	3,542	3,580	
Fairfax	10,977	12,762	185	202	3799	3082	11	226	4755	3632	19,728	19,903	
Loudoun	3,414	3,815	16	63	1706	1466	279	382	1330	1170	6,746	6,896	
Prince William	4,629	4,873	136	102	1259	1037	11	9	1945	1687	7,980	7,709	
Alexandria	1,398	1,674	6	32	299	200	4	2	560	394	2,267	2,303	
Fairfax City	379	402	131	168	110	89			126		746	659	
Falls Curch	154	178			70	61			76		300	238	
Manassas	467	657	41	39	67	49	8	36	229		812	781	
Manassas Park	159	201			66	58	0.1	0.04	69		294	258	
Total	46,060	51,952	1,081	1,623	17,772	13,488	713	1,111	24,871	17,804	**90,497**	**85,978**	**5.0**

Data Sources:

2011
Point, Area, Nonroad (NMIM & MAR), Onroad (MOVES) - NEI 2011 (Provided by State Air Agencies)

2017
Point, Area, Nonroad (NMIM & MAR) - MARAMA
Onroad (MOVES) -
NOx - FY2013 CLRP Report
VOC – Average ozone season day emissions from FY2013 CLRP report were converted to annual emissions using the BY2002 annual/daily VOC ratio (349.8) from the 1997 ozone SIP. Since this particular SIP used Mobile6.2 model for onroad emissions calculation, this ratio may change if MOVES model is used.

Table 3

Reasonable Further Progress Calculations

Pollutant (Tons per year)	2011	2017	2011-2017	Percentage Emission Reduction (2011-2017)	15% RFP Emission Reduction Requirement Met?
NOx	100,446	90,336	10,110	10.1	**Yes**
VOC	90,497	85,978	4,519	5.0	
Total (VOC + NOx)				**15.1**	