

US EPA ARCHIVE DOCUMENT

## ENCLOSURE I

### RICHMOND OZONE NONATTAINMENT AREA REQUEST FOR RECLASSIFICATION

#### ADDITIONAL TECHNICAL SUPPORT INFORMATION

Provided below is additional monitoring, modeling, and emissions data and analyses to further support the Commonwealth's request that the Richmond area be reclassified to a "marginal" nonattainment area under the 8-hour ozone National Ambient Air Quality Standard.

##### **Ozone Air Quality Monitoring**

The previous technical data provided demonstrated that the majority of the ozone air quality characteristics and trends for the Richmond area are indicative of a marginal nonattainment area. Current monitoring data and associated design values for 2002 to 2004 (to date) shows that all the area monitors are within the marginal ozone concentration range. In addition, the downward trend in design values and the area average concentrations continues from the "worst-case" period of 1997 – 1999. Table 1 contains the current design values for all ozone monitors in Virginia.

##### **Regional Ozone Modeling**

Two regional modeling analyses are available to indicate the predicted ozone status of the Richmond area in 2007. The first of these analyses is the EPA modeling performed to support the regional ozone transport reduction (NO<sub>x</sub> SIP Call) rule. This modeling exercise used a future year of 2007 and produced Relative Reduction Factors (RRF) that can be applied to the past and present monitor design values to predict the future compliance status of the Richmond area. The results of this subsequent analysis (Table 2) show that this modeling predicts that all four area monitors will be in compliance with the 8-hour ozone standard by 2007.

The second analysis has been performed by DEQ using the previous Early Action Compact (EAC) modeling effort. The initial results of this modeling were provided in the original request support package. However, after discussions with regional air staff concerning several modeling issues, another modeling run has been performed to ensure consistency between the base and future cases. Also, adjustments in the historical design values used in the attainment test have been made to be consistent with the draft guidance for 8-hour ozone modeling and attainment demonstration. The results of this subsequent analysis are

presented in Table 3. This analysis predicts that all the Richmond area monitors will be in compliance with the 8-hour ozone standard by 2007.

### **Emission Reduction Comparison**

As further support for the reclassification request, an emission reduction analysis and comparison has been performed to show the potential reductions that will be achieved under various scenarios. This analysis shows that more emission reductions can be achieved through the bump-down commitments than by retaining the moderate classification and related controls. It has been estimated that up to 8 tons per day (tpd) of VOC emissions will be reduced in Richmond by implementing the OTC controls. An additional 1 to 2 tpd of VOC reductions will be achieved from the expansion of existing nonattainment controls to the three new nonattainment jurisdictions. In contrast, moderate area controls such as a basic vehicle inspection program and NO<sub>x</sub> RACT will only produce up to 1 tpd of VOC and 2 tpd of NO<sub>x</sub> reductions.

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**TABLE 1**

<b>Virginia Department of Environmental Quality                      2002-2004 Fourth Highest Daily Maximum Ozone 8-hour Averages                      Units, ppb</b>					
Monitoring Sites	AIRS ID	2002	2003	2004	3-year average (Through 8/27/04)
Wythe Co.	511970002	85	81	69	78
Roanoke Co.	511611004	91	77	71	79
Rockbridge Co.	511630003	78	75	66	73
Page Co.	511390004	79	83	70	77
Frederick Co.	510690010	91	79	66	78
Fauquier Co.	510610002	84	76	71	77
Caroline Co.	510330001	85	81	75	80
<b>Richmond Area:</b>					
Chesterfield Co.	510410004	93	79	75	82
<i>Henrico Co.</i>	510870014	98	83	74	85
<i>Hanover Co.</i>	510850003	106	86	78	90
<i>Charles City Co.</i>	510360002	105	79	77	87
<b>Tidewater Area:</b>					
<i>Hampton</i>	516500004	102	83	74	86
<i>Suffolk - TCC</i>	518000004	98	83	74	85
Suffolk - Holland	518000005	92	79	71	80
<b>Northern Virginia Area:</b>					
<i>Loudoun Co.</i>	511071005	102	83	80	88
Stafford Co.	511790001	94	85	73	84
Prince William Co.	511530009	87	86	77	83
<i>Arlington Co.</i>	510130020	112	87	87	95
<i>Alexandria</i>	515100009	103	83	80	88
<i>Fairfax Co. - Lee Park</i>	510590030	108	89	92	96
<i>Fairfax Co. - McLean</i>	510595001	99	75	84	86
<i>Fairfax Co. - Mt. Vernon</i>	510590018	106	91	93	96
Fairfax Co. - Chantilly	510590005	92	83	79	84
<i>Fairfax Co. - Annandale</i>	510591005	108	83	91	94
Madison Co. - Shenandoah National Park	511130003	86	86	75	82
(Site operated by the National Park Service)					

**TABLE 2  
EPA NO<sub>x</sub> SIP CALL MODELING RESULTS FOR RICHMOND**

Monitor	Design Value (1998 – 2000)	Relative Reduction Factor	Future Design Value
Charles City	<b>87 ppb</b>	0.8609	<b>74.9 ppb</b>
Chesterfield	<b>91 ppb</b>	0.8531	<b>77.6 ppb</b>
Hanover	<b>95 ppb</b>	0.8579	<b>81.5 ppb</b>
Henrico	<b>88 ppb</b>	0.8662	<b>76.2 ppb</b>
Monitor	Design Value (2001 – 2003)	Relative Reduction Factor	Future Design Value
Charles City	<b>86 ppb</b>	0.8609	<b>74.0 ppb</b>
Chesterfield	<b>90 ppb</b>	0.8531	<b>76.8 ppb</b>
Hanover	<b>94 ppb</b>	0.8579	<b>80.6 ppb</b>
Henrico	<b>91 ppb</b>	0.8662	<b>78.8 ppb</b>

**TABLE 3  
DEQ MODELING RESULTS FOR RICHMOND**

**Selection of Current Design Values (per Draft EPA Ozone Modeling Guidance)**

County/City	AIRS ID	1998-2000 Design Value, ppb	2000-2002 Design Value, ppb	Current Design Value
Chesterfield	510410004	88	86	88
Henrico	510870014	92	91	92
Hanover	510850001	95	94	95
Charles City	510360002	88	90	90

**Attainment Test Results for Monitors in Richmond Area (Maximum in Nine Grid Cells)**

County/City	AIRS ID	Modeled Average Base- Year (1999) Daily 8-hr Maximum O3 (ppb)	Modeled Average Future-Year (2007) Daily 8- hr Maximum O3 (ppb)	Relative Reduction Factor (RRF)	Current Design Value (ppb)	Future Design Value (ppb)	Pass/Fail Status
Chesterfield	510410004	89.57	77.18	0.862	88	<b>75.9</b>	<b>Pass</b>

Henrico	510870014	97.39	83.09	0.853	92	<b>78.5</b>	<b>Pass</b>
Hanover	510850001	94.11	82.2	0.873	95	<b>82.9</b>	<b>Pass</b>
Charles City	510360002	90.22	79.96	0.886	90	<b>79.7</b>	<b>Pass</b>