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Revision of State Implementation Plan (SIP) and 110(l) Demonstration for Decommissioning of Stage II in the Baltimore, Washington, and Philadelphia Nonattainment Areas

I. Background

A. Stage II Vapor Recovery Requirements

Stage II gasoline vapor recovery systems capture gasoline vapors displaced during transfer of gasoline from the gasoline dispensing unit to the motor vehicle fuel tank during vehicle refueling at a gasoline dispensing facility (GDF). Stage II involves use of special refueling nozzles and coaxial hoses for vapor collection at each gasoline pump at a subject GDF. Gasoline vapors belong to a class of pollutants known as volatile organic compounds (VOC). These compounds along with nitrogen oxides (NO_X) are precursors to the formation of ground-level ozone. Stage II gasoline vapor recovery systems have been a required emission control measure in areas classified as moderate, serious, severe, and extreme for the ozone NAAQS.

With the amendment of the CAA in 1990, Stage II controls were required for moderate ozone areas, under CAA section 182(b)(3). However, under section 202(a)(6) of the CAA, 42 U.S.C. 7521(a)(6), the requirements of section 182(b)(3) no longer apply in moderate ozone nonattainment areas after EPA promulgated standards for onboard refueling vapor recovery (ORVR) as part of new motor vehicles' emission control systems. However, some moderate ozone areas retained Stage II requirements to provide a control method to comply with rate-of-progress targets or other emission reduction planning goals.

ORVR is a mechanism employed by vehicles to re-use the vapors in their gas tanks instead of allowing them to escape. Over time, as non-ORVR vehicles continue to be replaced by ORVR-equipped vehicles, the benefits of Stage II vapor recovery programs diminish. ORVR equipment has been phased in for new passenger vehicles beginning with model year 1998, and starting in 2001 for light-duty trucks and most heavy-duty gasoline-powered vehicles. ORVR equipment has been installed on nearly all (~99%) new gasoline-powered light-duty vehicles, light-duty trucks and heavy-duty vehicles since 2006.

Congress recognized that ORVR and Stage II would eventually become largely redundant technologies, and provided authority to the EPA to allow states to remove Stage II from their SIPs after EPA finds that ORVR is in widespread use. On May 16, 2012, EPA determined that ORVR technology is in widespread use throughout the U.S. vehicle fleet and waived the requirement for states to implement Stage II vapor recovery at GDFs in nonattainment areas classified as Serious or above for the ozone NAAQS (77 FR 28772). EPA determined that emission reductions from ORVR-equipped vehicles are essentially equal to and will soon surpass the emission reductions achieved by Stage II alone (77 FR 28772). In fact, in areas where certain types of vacuum-assist Stage II control systems are used, the limited compatibility between ORVR and some configurations of this Stage II hardware may ultimately result in an area-wide emissions disbenefit. Therefore, EPA also exercised its authority under CAA section 202(a)(6) to waive certain federal statutory

requirements for Stage II gasoline vapor recovery at GDFs. EPA determined that a state previously required to implement a Stage II vapor recovery program may take appropriate action to remove the measure from its SIP (77 FR 28772).

States wishing to phase out SIP-approved Stage II programs must submit a SIP revision to EPA requesting removal of the program from the SIP. The SIP must demonstrate that the program does interfere with progress towards any area in the state achieving compliance with any NAAQS.States in the Ozone Transport Region (OTR) defined by the CAA remain obligated under CAA section 184(b)(2) to implement either a Stage II program or other measures capable of achieving emissions reductions comparable to those achievable by Stage II, statewide. EPA issued guidance on this OTR Comparability demonstration requirement in 1995, and updated that guidance as part of its August 7, 2012 guidance on removing Stage II programs, in light of the EPA ORVR Widespread Use Determination and the decreasing role of Stage II as a means of controlling vehicle refueling emissions.

B. Maryland's Stage II Vapor Recovery Program

The Baltimore area and the Maryland portion of the Philadelphia-Wilmington-Trenton, PA-NJ-DE-MD were designated as severe nonattainment under the 1990 1-hour ozone NAAQS. The Maryland portion of the Washington, DC-MD-VA area was designated as serious under the 1990 1-hour ozone NAAQS. On January 24, 2003 (68 FR 3410), EPA reclassified the Washington, DC 1-hour ozone nonattainment area from serious to severe due to failure to meet attainment deadlines. Under the 1997 8-hour ozone NAAQS all three areas were designated as moderate nonattainment areas.

Maryland adopted Stage II vapor recovery regulations (COMAR 26.11.24) for the Maryland portions of the Washington, the Philadelphia-Wilmington-Trenton, and the Baltimore nonattainment areas on January 18, 1993 (*Maryland Register*, February 5, 1993, Vol. 20, Issue 3). EPA approved that rule as part of the Maryland SIP via a rule published in the *Federal Register* on June 9, 1994 (59 FR 29730). Maryland revised its Stage II regulation on January 26, 2005 (*Maryland Register*, February 18, 2005, Vol. 20, Issue 3). EPA approved that revised rule as part of the Maryland SIP via a rule published in the Federal Register on May 8, 2006 (71 FR 26688).

EPA's implementation rule for the 1997 8-hour ozone NAAQS (70 FR 71612, November 29, 2005) retained Stage II requirements under CAA section 182(b)(3), but only as they applied to the nonattainment areas for the area's classification for the 1-hour ozone NAAQS designation and for the 8-hour ozone NAAQS. *See* 40 CFR 51.900(f). Therefore, the attainment and maintenance plans for both NAAQS contain provisions for the implementation of Stage II.

II. Summary of SIP Revision

Under CAA section 110(ℓ), the EPA cannot approve a SIP revision if it would interfere with attainment of the NAAQS, reasonable further progress toward attainment, or any other applicable requirement of the Clean Air Act. Therefore, a SIP revision requesting removal of an approved Stage II program from the SIP may only be approved if there is a basis in the state's

submittal for concluding that approval of the revision would not interfere with attainment or maintenance with any NAAQS, including the 2008 ozone NAAQS. In evaluating whether a given SIP revision would interfere with attainment or maintenance, as required by section 110(ℓ), the EPA generally considers whether the SIP revision will allow for an increase in actual emissions into the air over what is allowed under the existing EPA-approved SIP. The EPA has not required that a state produce a new complete attainment demonstration for every SIP revision, provided that the status quo air quality is preserved. *See, e.g., Kentucky Resources Council, Inc.,* v. *EPA,* 467 F.3d 986 (6th Cir. 2006); *see also,* 61 FR 16,050, 16,051 (April 11, 1996) (actions on which the *Kentucky Resources Council* case were based).

The analysis submitted by MDE "Stage II Emission Reduction Benefits"addresses the benefits and therefore the effects of removing Stage II from the Maryland portions of the Washington and Philadelphia areas and the Baltimore area. In accordance with section 110(ℓ) of the CAA, the analysis demonstrates that the removal of Stage II from the Baltimore and Washington nonattainment areas and Cecil County portion of the Philadelphia area will not interfere with the attainment or maintenance of the NAAQS if reductions from other measures can be substituted for the loss in benefits from Stage II or if Stage II no longer provides any emission reduction benefits. In this demonstration, MDE followed the requirements provided by EPA: "*Guidance on Removing Stage II Gasoline Vapor Control Programs from State Implementation Plans and Assessing Comparable Measures."* The guidance provides a method in which states could provide modeling analysis showing that increased emissions from non-ORVR compatible Stage II would eventually reduce the benefits from the implementation of Stage II. Also, the guidance gave the states flexibility to provide additional or alternate analyses to EPA for consideration.

MDE used the MOVES model to estimate the area-wide VOC inventory emissions benefits from Stage II, on a county level basis, from the twelve counties comprising Maryland's portion of the three Maryland nonattainment areas with currently operating Stage II programs. Maryland's consultant, Meszler Engineering Services (MES) performed an analysis of the potential impacts associated with the elimination of Stage II requirements in Maryland, evaluating potential gasoline refueling emissions trends related to both onboard refueling vapor recovery (ORVR) and Stage II control technology over the period 2011 through 2020. MES also evaluated the potential impact of indirect excess emissions (IEE), caused by a negative interaction between ORVR and some Stage II controls, on gasoline refueling emissions and quantified the potential timeframe in which IEE emissions may lead to a crossover point, following which Stage II emissions controls might actually result in an increase in refueling emissions above levels that would result if Stage II controls were eliminated. The MOVES model runs demonstrate the reduction in control benefits from non-ORVR compatible Stage II.

While MES analyzed Stage II benefits in several different ways, with slightly different assumptions, MDE is basing its analysis of the program's benefits on Scenario 1 of the MES analysis, the results of which apply solely to gasoline vapor displacement emissions associated with onroad vehicle refueling. These results indicate the interaction between ORVR and Stage II controls assuming no gasoline spillage benefits (for either technology) and no Stage II control associated with nonroad equipment and vehicles or portable refueling containers. In the context of analysis design, this set of results is consistent with similar analyses that MDE has seen in other states' analysis and from EPA.

The program effectiveness assumptions upon which MDE relies for this analysis can be viewed in Table 1 below:

Table 1. Emissions Impact Effectiveness Assumptions

Analysis Parameter	*MES Scenario 1*
Onroad Vehicle Emissions Impact Parameters	
ORVR Spillage Reduction Factor	50%
ORVR Vapor Displacement Reduction Factor	98%
Stage II Spillage Reduction Factor	70%
Stage II Vapor Displacement Reduction Factor	70%
Use MOVES Stage II Spillage Assumptions	Yes
Incompatibility Excess Emissions Rate (1)	0.3901 [0.00086]
Nonroad Equipment and Vehicle Emissions Impact Parameters	
Spillage Reduction Factor at a Balance System Pump	70%
Spillage Reduction Factor at a Vacuum Assist Pump	70%
Vapor Displacement Reduction Factor at a Balance System Pump	0%
Vapor Displacement Reduction Factor at a Vacuum Assist Pump	70%
Portable Refueling Container (Pump Refilling) Emissions Impact Parameters	
Spillage Reduction Factor at a Balance System Pump	70%
Spillage Reduction Factor at a Vacuum Assist Pump	70%
Vapor Displacement Reduction Factor at a Balance System Pump	0%
Vapor Displacement Reduction Factor at a Vacuum Assist Pump	56%
Notes: (1) grams [pounds] per gallon dispensed to ORVR-equipped vehicles.	

Table 2 provides data for the types of Stage II systems employed in Maryland's program. These data, which are summarized in Table 3, indicate a near negligible fraction of balance-type systems. Healy vacuum assist systems are identified as distinct from other vacuum assist systems, but MES does not believe that one can assume that all existing Healy systems are ORVR compatible, so this analysis treats all vacuum assist systems as a group (of unknown V/L performance). As indicated in Table 2, the identified Healy systems account for less than five percent of all gasoline throughput, so any error associated with this aggregation is small.

Table 2. Stage II System Distribution (fraction of Stage II gasoline throughput)

County	Balance System	Vacuum Assist	Healy Vacuum Assist
Anne Arundel	0.3%	94.3%	5.4%
Baltimore	0.5%	95.2%	4.3%
Calvert	0.0%	94.2%	5.8%
Carroll	0.2%	98.4%	1.4%
Cecil	0.3%	96.8%	2.9%
Charles	0.1%	83.8%	16.1%
Frederick	0.3%	96.3%	3.4%
Harford	0.1%	97.8%	2.0%
Howard	0.3%	98.4%	1.4%
Montgomery	0.3%	97.0%	2.8%
Prince George's	0.1%	92.2%	7.7%
Baltimore City	0.3%	98.4%	1.3%
Stage II Area Total	0.3%	95.0%	4.7%

Based on these assumptions and a reasonable non-zero IEE, expressing the incompatibility assumption between certain Stage II systems in use in Maryland and ORVR, the results of the analysis for the areawide Stage II emissions reductions from year 2011 to 2020 are provided in Table 3. The results provided in Table 3 demonstrate that in 2016 there will be minimal excess emissions from Stage II based on the procedures and guidelines used in prior SIP submittals. Maryland plans on allowing the decommissioning of Stage II from October 1, 2016. A detailed summary of MDE's review and rationale for proposing the decommissioning of Stage II can be found in the analysis "Stage II Emission Reduction Benefits" in Technical Support Document (TSD) prepared to support this action.

Table 3.Stage II VOC Reductions for Maryland Portion of Baltimore, Washington, and Philadelphia Counties[1](*in metric tons per day*)

County	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Anne Arundel	0.33	0.22	0.14	0.07	0.01	-0.03	-0.07	-0.09	-0.11	-0.12
Baltimore	0.45	0.30	0.18	0.09	0.01	-0.05	-0.09	-0.13	-0.15	-0.17
Calvert	0.05	0.04	0.02	0.01	0.01	0.00	-0.01	-0.01	-0.01	-0.02
Carroll	0.08	0.05	0.03	0.02	0.00	-0.01	-0.02	-0.02	-0.03	-0.03
Cecil	0.10	0.07	0.05	0.04	0.02	0.01	0.00	-0.01	-0.01	-0.02
Charles	0.09	0.06	0.04	0.02	0.01	0.00	-0.01	-0.02	-0.03	-0.03
Frederick	0.19	0.14	0.09	0.05	0.02	-0.01	-0.03	-0.04	-0.05	-0.06
Harford	0.14	0.09	0.06	0.03	0.01	-0.01	-0.03	-0.04	-0.05	-0.05
Howard	0.21	0.14	0.09	0.04	0.00	-0.02	-0.05	-0.06	-0.08	-0.08
Montgomery	0.48	0.34	0.21	0.11	0.03	-0.03	-0.08	-0.12	-0.15	-0.17
Prince George's	0.56	0.39	0.25	0.13	0.04	-0.04	-0.09	-0.13	-0.16	-0.18
Baltimore City	0.19	0.13	0.08	0.03	0.00	-0.03	-0.05	-0.06	-0.07	-0.08
Baltimore Region Total	1.39	0.94	0.57	0.28	0.04	-0.15	-0.30	-0.41	-0.48	-0.54
Washington Region Total	1.37	0.96	0.62	0.33	0.10	-0.08	-0.22	-0.33	-0.40	-0.46
Philadelphia Region Total	0.10	0.07	0.05	0.04	0.02	0.01	0.00	-0.01	-0.01	-0.02
Stage II Area Total	2.86	1.97	1.25	0.65	0.17	-0.22	-0.52	-0.74	-0.90	-1.01

1. Assuming non-Zero IEE, Onroad Only emissions, Displacement Plus Spillage Impacts, Scenario 1. Reference: Table 16 "Stage II Emission Reduction Benefits" in Appendix C.

Based on this analysis, by 2016, emissions benefits from the Stage II program, in conjunction with ORVR, will be overwhelmed by the emissions disbenefit associated with the excess emissions caused by the incompatibility between certain ORVR-incompatible vacuum-assist type Stage II systems in use in Maryland and ORVR systems on cars in-use in Maryland. For this reason, MDE has elected to decommission the Stage II program beginning in October 2016. Since emissions benefits from Stage II operation become a disbenefit beginning in 2016, MDE believes discontinuance of Stage II in 2016 will not interfere with any of the three Maryland ozone nonattainment areas (Baltimore, Washington, and Cecil County) where Stage II systems are being decommissioned with those areas' ability to attain any NAAQS.

III. Comparable Measures Demonstration and Section 193

All areas of the Northeast Ozone Transport Region (OTR), both attainment and nonattainment, are subject to the requirements of CAA section 184(b)(2), commonly referred to as the "comparable measures requirement." Section 184(b)(2) directs these areas to adopt and implement either Stage II controls meeting the general requirements for Stage II gasoline vapor recovery programs under CAA section 182(b)(3), or "control measures capable of achieving emissions reductions comparable to those achievable" by Stage II.

Maryland submitted a comparable measures SIP revision to EPA on November 5, 1997 containing a demonstration of how control measures already being implemented in the remaining counties in Maryland not already implementing Stage II are achieving comparable emission reductions as would be achieved by a Stage II vapor recovery program. These counties include: Allegany, Caroline, Dorchester, Garrett, Kent, Queen Anne's, Somerset, St. Mary's, Talbot, Washington, Wicomico, and Worcester Counties.

Maryland opted to satisfy the Stage II comparability requirement by adopting other control strategies to achieve emission reductions comparable to those from implementing Stage II, including:

1. COMAR 26.11.19.09 Cold and Vapor Degreasing, adopted effective April 4, 2010 (76 FR 09656, February 22, 2011).
2. COMAR 26.11.19.11 Lithographic Printing, adopted effective October 31, 2011 (77 FR 4300, July 23, 2012).
3. COMAR 26.11.19.18 Screen Printing, adopted effective June 10, 2002 (68 FR 01972, January 15, 2003).
4. COMAR 26.11.19.19 Expandable Polystyrene Operations, adopted effective July 3, 1995 (66 FR 22924, June 7, 2001).
5. COMAR 26.11.19.23 Vehicle Refinishing, adopted effective April 16, 2012 (62 FR 41853, September 26, 2012).

EPA approved Maryland's November 1997 Stage II comparability SIP for the attainment and marginal ozone nonattainment counties in a final action published in the December 9, 1998 *Federal Register* (63 FR 67780). However, Maryland must still demonstrate Stage II comparability for the Washington, Baltimore, and Philadelphia area counties where Stage II is no longer required. Comparable measures must remain in effect. Maryland has demonstrated in its CAA 110(ℓ) noninterference demonstration that Stage II no longer yields positive VOC benefits beyond 2016 when done in conjunction with ORVR. Therefore, since Stage II on-road benefits become negative after 2016, Maryland believes that the requirement for a CAA section 184(b)(2) comparability analysis have been met.

Section 193 applies to any current nonattainment area that adopted a Stage II control program into its SIP prior to November 15, 1990. Maryland did not have a Stage II control program prior to November 15, 1990, therefore, section 193 does not apply.

IV. Results

The analysis demonstrates that decommissioning Stage II after October 1, 2016, results in no loss of VOC control due to incompatibility excess emissions. Therefore, the decommissioning Stage II systems in Baltimore and Washington and Philadelphia (Cecil County) areas beginning October 1, 2016, will not infringe on any requirements in § 184(b)(2) of the CAA.

V. MOVES Data, Assumptions and Parameters

The analysis results apply solely to gasoline vapor displacement emissions associated with onroad vehicle refueling. These results indicate the interaction between ORVR and Stage II controls assuming no gasoline spillage benefits (for either technology) and no Stage II control associated with nonroad equipment and vehicles or portable refueling containers. In the context of analysis design, this set of results is consistent with similar analyses from the EPA and MDE.

In total, 360 scenarios were processed through the MOVES model, each applicable to one of the 12 Stage II counties. At 12 counties and 10 evaluation years per county, there are 120 MOVES scenarios per scenario"group." A total of three scenario "groups" were modeled. One group of 120 MOVES runs estimated emissions in the absence of ORVR, spillage, and Stage II controls. This group forms the basis of the onroad vehicle portion of the spreadsheet developed for this analysis. A second group of 120 MOVES runs estimated emissions with ORVR and spillage controls in place, as defined by default EPA database tables. A third group of 120 MOVES runs estimated emissions with ORVR and spillage controls in place, as defined by default EPA database tables, and Stage II controls in place as defined by MDE. These latter two groups were analyzed to ensure that the algorithms implemented in the spreadsheet developed for this analysis were identical to those implemented in MOVES (in effect, to ensure that spreadsheet predicted Stage II impacts would exactly match the same impacts that would be estimated by additional tailored MOVES runs).

Table 4. Impacts Included In Analysis Results

Emissions Impact Type	Results Set 1
Onroad Displacement Emissions	Included
Onroad Spillage Emissions	Not Included
Nonroad Displacement Emissions	Not Included
Nonroad Spillage Emissions	Not Included
Benefit of Results Set	Isolates onroad displacement effects, allowing effects of spillage uncertainty to be understood.

Table 4 presents the various system effectiveness assumptions used to evaluate the impacts of Stage II controls. ORVR spillage and vapor displacement effectiveness estimates are taken (without change) from the databases underlying the EPA MOVES model. For onroad vehicles, Stage II effectiveness assumptions for "nominal" scenario1 are set at values used by MDE.

Table 5. Fuel Consumption Fractions of ORVR-Equipped Vehicles

County	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Anne Arundel	77.3%	81.7%	85.2%	88.1%	90.3%	92.2%	93.5%	94.6%	95.4%	96.0%
Baltimore	77.7%	82.0%	85.5%	88.3%	90.5%	92.3%	93.6%	94.6%	95.4%	95.9%
Calvert	74.4%	79.3%	83.4%	86.7%	89.3%	91.5%	93.1%	94.4%	95.3%	96.0%
Carroll	76.5%	81.0%	84.7%	87.7%	90.1%	92.0%	93.5%	94.6%	95.4%	96.1%
Cecil	71.4%	76.5%	80.6%	84.0%	86.8%	89.0%	90.8%	92.1%	93.2%	94.0%
Charles	75.0%	79.8%	83.8%	87.0%	89.6%	91.7%	93.3%	94.5%	95.4%	96.1%
Frederick	75.0%	79.8%	83.7%	87.0%	89.6%	91.6%	93.2%	94.4%	95.3%	96.0%
Harford	76.9%	81.4%	85.0%	87.9%	90.2%	92.0%	93.4%	94.5%	95.3%	95.9%
Howard	77.8%	82.1%	85.6%	88.3%	90.5%	92.3%	93.6%	94.6%	95.4%	96.0%
Montgomery	76.4%	81.0%	84.7%	87.7%	90.2%	92.1%	93.6%	94.7%	95.5%	96.1%
Prince George's	76.1%	80.7%	84.5%	87.6%	90.0%	92.0%	93.5%	94.6%	95.5%	96.1%
Baltimore City	78.5%	82.6%	86.0%	88.7%	90.8%	92.5%	93.8%	94.8%	95.5%	96.1%
Baltimore Region Total	77.6%	81.9%	85.4%	88.2%	90.5%	92.2%	93.6%	94.6%	95.4%	96.0%
Washington Region Total	76.0%	80.6%	84.4%	87.5%	90.0%	92.0%	93.5%	94.6%	95.5%	96.1%
Stage II Area Total	76.7%	81.2%	84.8%	87.8%	90.1%	92.0%	93.5%	94.5%	95.4%	96.0%

Table 6. Stage II Area Fuel Consumption (million gallons per summer weekday)

County	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Anne Arundel	0.93865	0.94224	0.94905	0.95099	0.94922	0.96174	0.97973	0.96800	0.95589	0.94230
Baltimore	1.32527	1.32405	1.32757	1.32435	1.31606	1.31851	1.32822	1.30927	1.28994	1.26861
Calvert	0.11760	0.12032	0.12324	0.12553	0.12731	0.12823	0.12971	0.13050	0.13116	0.13153
Carroll	0.21650	0.21885	0.22189	0.22380	0.22482	0.23151	0.23968	0.23755	0.23531	0.23271
Cecil	0.19541	0.20031	0.20584	0.21001	0.21337	0.21537	0.21836	0.22005	0.22155	0.22264
Charles	0.20133	0.20595	0.21093	0.21486	0.21793	0.21950	0.22204	0.22342	0.22460	0.22525
Frederick	0.45177	0.46051	0.46998	0.47705	0.48222	0.48406	0.48803	0.48971	0.49095	0.49104
Harford	0.38133	0.38576	0.39142	0.39511	0.39728	0.40977	0.42494	0.42139	0.41764	0.41323
Howard	0.63166	0.63404	0.63862	0.63996	0.63884	0.64694	0.65873	0.65095	0.64294	0.63388
Montgomery	1.25379	1.26384	1.27593	1.28165	1.28262	1.27445	1.27221	1.26580	1.25854	1.24833
Prince George's	1.42185	1.42844	1.43729	1.43885	1.43500	1.42112	1.41394	1.40251	1.39019	1.37474
Baltimore City	0.60671	0.60561	0.60676	0.60488	0.60074	0.60064	0.60388	0.59512	0.58623	0.57638
Baltimore Region Total	4.10012	4.11054	4.13531	4.13910	4.12697	4.16911	4.23518	4.18228	4.12795	4.06710
Washington Region Total	3.44633	3.47907	3.51738	3.53794	3.54509	3.52737	3.52592	3.51194	3.49544	3.47089
Stage II Area Total	7.74186	7.78992	7.85853	7.88704	7.88542	7.91185	7.97946	7.91427	7.84494	7.76063

Table 7. Emissions Adjustment and Speciation Factors

Emission Species	Vapor Displacement Emissions	Spillage Emissions
Total Organic Gases (TOG)	1.00000	
Total Hydrocarbons (THC)	0.88934	0.91090
Volatile Organic Compounds (VOC)	1.00000	
Methane (CH_4)	0.00000	
Non-Methane Organic Gasses (NMOG)	1.00000	
Non-Methane Hydrocarbons (NMHC)	0.88934	0.91090
Methyl Tertiary Butyl Ether (MTBE)	0.00000	
Ethanol	0.13345	
Benzene	0.00333	
Xylene	0.06423	
Toluene	0.14336	
Ethyl Benzene	0.01721	
Hexane	0.02536	
2,2,4-Trimethylpentane	0.03354	
Naphthalene	0.00040	

Table 8. Stage II Reductions with Non-Zero IEE
Onroad Only, Displacement Plus Spillage Impacts, Scenario 1
(VOC, metric tonnes per day)

County	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Anne Arundel	0.33	0.22	0.14	0.07	0.01	-0.03	-0.07	-0.09	-0.11	-0.12
Baltimore	0.45	0.30	0.18	0.09	0.01	-0.05	-0.09	-0.13	-0.15	-0.17
Calvert	0.05	0.04	0.02	0.01	0.01	0.00	-0.01	-0.01	-0.01	-0.02
Carroll	0.08	0.05	0.03	0.02	0.00	-0.01	-0.02	-0.02	-0.03	-0.03
Cecil	0.10	0.07	0.05	0.04	0.02	0.01	0.00	-0.01	-0.01	-0.02
Charles	0.09	0.06	0.04	0.02	0.01	0.00	-0.01	-0.02	-0.03	-0.03
Frederick	0.19	0.14	0.09	0.05	0.02	-0.01	-0.03	-0.04	-0.05	-0.06
Harford	0.14	0.09	0.06	0.03	0.01	-0.01	-0.03	-0.04	-0.05	-0.05
Howard	0.21	0.14	0.09	0.04	0.00	-0.02	-0.05	-0.06	-0.08	-0.08
Montgomery	0.48	0.34	0.21	0.11	0.03	-0.03	-0.08	-0.12	-0.15	-0.17
Prince George's	0.56	0.39	0.25	0.13	0.04	-0.04	-0.09	-0.13	-0.16	-0.18
Baltimore City	0.19	0.13	0.08	0.03	0.00	-0.03	-0.05	-0.06	-0.07	-0.08
Baltimore Region Total	1.39	0.94	0.57	0.28	0.04	-0.15	-0.30	-0.41	-0.48	-0.54
Washington Region Total	1.37	0.96	0.62	0.33	0.10	-0.08	-0.22	-0.33	-0.40	-0.46
Stage II Area Total	2.86	1.97	1.25	0.65	0.17	-0.22	-0.52	-0.74	-0.90	-1.01

Note: Tables 3-9 are from Appendix C of TSD.

VI. Proposed Regulatory Action and Decommissioning Procedures

The proposed action provides new and existing GDFs and those undergoing major modifications a regulatory option to either not install or decommission Stage II vapor recovery equipment. Existing GDFs may decommission Stage II vapor recovery equipment after October 1, 2016.

The proposed regulation is developed in accordance with EPA's "Guidance on Removing Stage II Gasoline Vapor Control Programs from State Implementation Plans and Assessing Comparable Measures" (Guidance) EPA-457/B-12-001, August 7, 2012.

Maryland is proposing the following amendments to COMAR 26.11.24:

1. Allow GDFs constructed after the effective date of the regulation the option to not install and operate Stage II systems;

2. Allow existing GDFs undergoing major modifications to decommission Stage II systems after the effective date of the regulation;

3. Allow existing GDFs to decommission Stage II systems after October 1, 2016; and

4. An owner or operator of a GDF that decommissions a Stage II vapor recovery system shall perform the decommissioning of the Stage II vapor recovery system in accordance with the "Recommended Practices for Installation and Testing of Vapor Recovery Systems at Vehicle Refueling Sites" of the Petroleum Equipment Institute, Section 14, 2009 and COMAR 26.10.10.

VII. Example of Baltimore City MOVES Run for Stage II Effectiveness

This example of Baltimore City run for Stage II effectiveness shows that the run is for vapor displacement and spillage emissions for the year 2020, month of July, Thursday, 24 hour period. More than 10 different types of gasoline powered vehicles included in the run are identified. Also identified in this example are the types of roads in the city and speciation of emissions. Output data is also identified.

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