
Source Category: Gasoline Distribution Facilities

INTRODUCTION

The purpose of this document is to provide a forum for public review and comment on the evaluation of candidate control measures that may be considered by the States in the Midwest Regional Planning Organization (MRPO) to develop strategies for ozone, PM_{2.5}, and regional haze State Implementation Plans (SIPs). Additional emission reductions beyond those due to mandatory controls required by the Clean Air Act may be necessary to meet SIP requirements and to demonstrate attainment. This document provides background information on the mandatory control programs and on possible additional control measures.

The candidate control measures identified in this document represent an initial set of possible measures. The MRPO States have not yet determined which measures will be necessary to meet the requirements of the Clean Air Act. As such, the inclusion of a particular measure here should not be interpreted as a commitment or decision by any State to adopt that measure. Other measures will be examined in the near future. Subsequent versions of this document will likely be prepared for evaluation of additional potential control measures.

The evaluation of candidate control measures is presented in a series of "Interim White Papers." Each paper includes a title, summary table, description of the source category, brief regulatory history, discussion of candidate control measures, expected emission reductions, cost effectiveness and basis, timing for implementation, rule development issues, other issues, and a list of supporting references. Tables 1a, 1b, and 1c summarize this information for gasoline distribution facilities.

SOURCE CATEGORY DESCRIPTION

Gasoline distribution facilities (GDFs) dispense gasoline to motor vehicle fuel tanks from stationary storage vessels. Retail GDFs include traditional service stations, as well as convenience stores, parking garages, and other similar facilities that sell gasoline to the public. Gasoline may also be distributed to vehicles through various non-retail outlets, such as government motor pools and private fleet servicing operations. Gasoline vapors are released to the atmosphere every time a fuel tank is filled with gasoline. This includes filling a large underground storage tank as well as the fuel tank of a motor vehicle. VOC emissions from GDFs are usually classified by three different processes:

- Stage I loading operations refer to the transfer of gasoline from tank trucks to underground storage tanks (UST). Emissions are generated when gasoline vapors in the UST are displaced to the atmosphere by the gasoline being loaded into the tank.
- Tank breathing losses occur daily and are attributable to gasoline evaporation and barometric pressure changes.
- Stage II vehicle refueling operations refer to the transfer of gasoline from the UST to the vehicle's fuel tank. Emissions are generated when gasoline vapors in the vehicle's fuel tank are displaced to the atmosphere by the gasoline being loaded into the tank. Included in this category are emissions from spillage from pre-fill and post-fill nozzle drip and from spit-back and overflows from the vehicles' fuel tank filler pipe during filling.

Emissions associated with GDFs were estimated to account for about 6.8 percent of the total anthropogenic VOC emissions in the LADCO region in 2002.

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TABLE 1a – CONTROL MEASURE SUMMARY FOR GDFs – STAGE I

Control Measure Summary	VOC Emissions (tons/year) in 5-State MRPO Region	
2002 existing measures: Submerged fill and vapor balance/recovery in selected counties	2002 Base:	42,463
2009 On-the Books measures: None	2002 Base: 2009 Reduction: 2009 Remaining:	42,463 <u>-0</u> 42,463
Candidate measure: Adopt CARB EVR Stage I requirements in 8-hour nonattainment areas and adjacent counties <i>Measure ID:</i> SOLV7A <i>Emission Reductions:</i> reduction of 30-78% from 2002 levels depending on the geographic coverage <i>Control Cost:</i> \$7,640 per ton to upgrade existing systems to meet CARB EVR Phase I requirements; \$100 to 4,742 for new Stage I systems; dependent on the size of the station <i>Timing of Implementation:</i> Assuming 2007 effective date of rule, emission reductions are achieved in 2011 with CARB's four-year window for existing facilities to upgrade equipment <i>Implementation Area:</i> (1) 8-hr ozone nonattainment areas, (2) 8-hr ozone nonattainment areas plus adjacent counties, or (3) all counties in MRPO region	2002 Base: 2011 Reduction: 2011 Remaining:	42,463 <u>-32,666</u> 9,796

Notes: 2009 and 2011 emission reductions shown are reductions for 2002 base emissions, assuming that control measures are implemented in all counties; 2009 and 2011 emissions are not growth-adjusted.

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TABLE 1b – CONTROL MEASURE SUMMARY FOR GDFs – STAGE II

Control Measure Summary	VOC Emissions (tons/year) in 5-State MRPO Region	
2002 existing measures: Stage II vapor recovery systems in moderate, serious, and severe for 1-hour ozone nonattainment areas	2002 Base:	44,815
2009 On-the Books measures: Use of on-board refueling vapor recovery (ORVR) canisters to capture and adsorb vapors from the vehicle fuel tank. ORVR is required to be installed on some new vehicles in 1998, and all new vehicles will be required to have ORVR installed by 2006.	2002 Base: 2009 Reduction: 2009 Remaining:	44,815 <u>-23,312</u> 21,503
Candidate measure: Adopt CARB EVR Stage II requirements in 8-hour nonattainment areas and adjacent counties <i>Measure ID:</i> SOLV7B <i>Emission Reductions:</i> reduction of 46-91% from 2002 levels depending on the geographic coverage <i>Control Cost:</i> \$36,260 per ton to upgrade existing systems to meet CARB EVR Phase II requirements; about \$13,300 for new Stage II systems in 2009, increasing to \$28,500 by 2015 <i>Timing of Implementation:</i> Assuming 2007 effective date of rule, emission reductions are achieved in 2011 with CARB's four-year window for existing facilities to upgrade equipment <i>Implementation Area:</i> (1) 8-hr ozone nonattainment areas, (2) 8-hr ozone nonattainment areas plus adjacent counties, or (3) all counties in MRPO region	2002 Base: 2009 Reduction: 2009 Remaining:	44,815 <u>-40,550</u> 4,265

Notes: 2009 and 2011 emission reductions shown are reductions for 2002 base emissions, assuming that control measures are implemented in all counties; 2009 and 2011 emissions are not growth-adjusted.

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TABLE 1c – CONTROL MEASURE SUMMARY FOR GDFs – UNDERGROUND TANKS

Control Measure Summary	VOC Emissions (tons/year) in 5-State MRPO Region	
2002 existing measures: P/V valve in Chicago and Metro East areas	2002 Base:	10,194
2009 On-the Books measures: None	2002 Base: 2009 Reduction: 2009 Remaining:	10,194 <u>-0</u> 10,194
Candidate measure: Require Air Pollution Control Device for UST Vent <i>Measure ID:</i> SOLV7C <i>Emission Reductions:</i> reduction of 28 to 72% from 2002 levels depending on the geographic coverage <i>Control Cost:</i> minimal if system recovers gasoline vapors and returns to storage tank <i>Timing of Implementation:</i> Assuming 2007 effective date of rule, emission reductions are achieved in 2009 <i>Implementation Area:</i> (1) 8-hr ozone nonattainment areas, (2) 8-hr ozone nonattainment areas plus adjacent counties, or (3) all counties in MRPO region	2002 Base: 2009 Reduction: 2009 Remaining:	10,194 <u>-7,340</u> 2,854

Notes: 2009 emission reductions shown are reductions for 2002 base emissions, assuming that control measures are implemented in all counties; 2009 emissions are not growth-adjusted.

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REGULATORY HISTORY

Requirements for the control of gasoline vapors at GDFs date back to the 1970's. In general, there are three regulatory programs related to GDFs:

- **Stage I Vapor Recovery.** The U.S. EPA initially established design criteria for Stage I vapor control systems at gasoline service stations in 1975. Many State and local agencies promulgated Stage I vapor control system regulations during the 1980s, requiring the use of submerged fill pipes to minimize the creation of vapors and, in some cases, a vapor balancing system that allows gasoline vapors from the UST to be displaced back to the tank truck during UST loading operations.
- **Stage II Vapor Recovery.** The 1990 Clean Air Act Amendments (CAAA) established two distinct approaches for controlling Stage II vehicle refueling emissions. The first approach uses a vapor recovery system installed on the dispensing nozzle to capture vapors displaced from the vehicle fuel tank during filling and return them to the underground storage tank. This type of vapor recovery system was required in ozone nonattainment areas that were designated as moderate, serious, severe, and extreme. A second CAAA approach requires the use of on-board refueling vapor recovery (ORVR) canisters to capture and adsorb vapors from the vehicle fuel tank and eventually release them to the vehicle's engine. ORVR is required to be installed on some new vehicles in 1998, and all new vehicles will be required to have ORVR installed by 2006.
- **Low Volatility Fuels.** There are also Federal fuel measures to limit gasoline volatility. The first measure set low Reid vapor pressure (RVP) gasoline requirements for each state, and also allowed States to establish more stringent RVP programs as a control measure in nonattainment areas. The second measure established requirements for reformulated gasoline (RFG) that is less volatile and otherwise blended to burn cleaner and reduce ozone-forming pollutants.

The following paragraphs describe the currently applicable regulations for controlling emissions from GDFs in the LADCO region. This is followed by a discussion of enhanced vapor recovery programs in other States that are more stringent than the Federal requirements or the programs in place in the LADCO states.

All five States in the LADCO region currently have regulations governing Stage I operations. A comparison of Federal requirements and current State regulations is presented in Attachment 1 for Stage I vapor control systems. In general, the State rules require submerged loading and vapor balancing or vapor control system to achieve a 90 percent reduction in VOC emissions. In the Chicago/Metro East area, there is also a requirement to have a pressure/vacuum relief valve connected to each vent pipe. Pressure/vacuum relief valves on vent pipes have been shown to improve the effectiveness of Stage I systems and enhance the performance of many Stage II systems. Stage I controls only apply to facilities that either exceed a throughput limit (e.g., 10,000 gallons per month) or have tanks storing gasoline which exceed a size limit (e.g., 575 gallons).

As required by the 1990 CAAA, LADCO states have required the installation of Stage II vapor recovery systems in areas that were designated as moderate, serious, and severe for ozone nonattainment. Most states require a 95 percent control efficiency for Stage II systems. The in-use efficiency achieved, however, is affected by rule effectiveness and rule penetration. The CAA exempts from the Stage II requirement stations that sell less than 10,000 gallons of gasoline per month. EPA has issued guidance that states that the exemption levels, along with a semi-annual inspection frequency, results in an 83

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percent in-use efficiency for a Stage II program. If inspections occur annually, the efficiency is estimated to be 77 percent. Minimal inspections reduce the in-use efficiency to 56 percent.

The U.S. EPA issued regulations requiring onboard vapor recovery (ORVR) standards for the control of refueling emissions in 1994. ORVR works by routing refueling vapors to a carbon canister on the vehicle and are expected to achieve from 95-98 percent reduction of the vehicle refueling emissions. Vehicle manufacturers were required to begin phasing in ORVR beginning in 1998, with 100 percent phase-in to be achieved by 2006. Once ORVR control systems are in widespread use through the vehicle fleet, then the U.S. EPA may exempt areas from Stage II vapor recovery system requirements.

As ORVR equipment is being phased in for new vehicles, there is some concern regarding the compatibility of ORVR controls and Stage II controls. When an ORVR-equipped vehicle refuels at GDF with Stage II VRS, the amount and composition of the vapor returned to the UST by the Stage II control system can be impacted. An increase in the amount of air (in lieu of gasoline vapor) returned to the vapor space of the UST will lead to gasoline evaporation, or vapor growth, in the UST and lead to excess emissions from the UST vent. A larger amount of air is returned to the UST vapor space for some Stage II vacuum assist VRS when refueling vehicles with ORVR controls, and therefore, the excess emissions are greater for some vacuum assist systems.

CARB has promulgated a new program in California in 2001 called Enhanced Vapor Recovery (EVR). The program includes six main modules, including changing the control efficiency requirement to 98 percent for Stage I vapor recovery, requiring P/V valves on all systems, improving the Stage II compliance certification process to increase effectiveness from 90 to 95 percent, and measures to improve ORVR compatibility. Initially, CARB believed full compliance could be achieved within four years. EVR is now being implemented over a period of eight years (full compliance in 2008) to allow time to develop and certify vapor recovery systems to the regulations' technology-forcing standards, as well as to provide a four-year window for existing facilities to upgrade equipment to meet the new standards.

CANDIDATE CONTROL MEASURES

The most promising reductions beyond current requirements can be obtained by increasing the required control efficiency of Stage I vapor recovery systems from 90 to 98 percent in areas with existing Stage I programs and requiring Stage I vapor recovery systems in areas that currently do not have Stage I vapor recovery requirements. Additional reductions could be obtained by requiring Stage I vapor recovery in counties bordering 8-hour ozone nonattainment areas. The Stage I requirements could be based on the CARB EVR Module 1 requirements, which changes the control efficiency requirement to 98 percent, requires P/V valves on all systems, and contains additional specifications to prevent leaks.

For Stage II emissions, the percentage of ORVR vehicles on the road will continue to increase as older vehicles are replaced by new ones. Adding new Stage II controls at gasoline stations will produce less reductions (at a higher cost) in the future. Additional reductions beyond current Stage II and ORVR requirements can be obtained by increasing the required control efficiency of Stage II vapor recovery systems from 90 to 95 percent in areas with existing Stage II programs and requiring Stage II vapor recovery systems in areas that currently do not have Stage II vapor recovery requirements. The Stage II requirements could be based on the CARB EVR Module 2 requirements.

For underground storage tank breathing losses, there is a commercially available membrane vapor recovery system to recover gasoline vapors and return them to the storage tank. One system is the **OPW Vaporsaver™** system, which reduces VOC emissions by 95-99%. When the pressure in the tank reaches

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a preset value, a pressure switch activates a small compressor that draws off excess vapor-laden air. A portion of the hydrocarbon vapors condense and are returned to the tank as a liquid. The remaining hydrocarbons permeate the membrane and are returned to the tank as concentrated vapor. Air, stripped of the hydrocarbons, is vented. In addition to eliminating hydrocarbon emissions, the unit pays for itself with the value of the recovered gasoline.

Measure SOLV7A – Adopt CARB EVR Stage I requirements. This control measure is based on the use of adoption of the CARB EVR Module 1 requirements that will increase the required control efficiency of Stage I vapor recovery systems from 90 to 98 percent in those counties with existing Stage I requirements. Optionally, the control measures could be extended to counties that currently do not have Stage I requirements.

Measure SOLV7B – Adopt CARB EVR Stage II requirements. This control measure is based on the use of adoption of the CARB EVR Module 2 requirements that will increase the required control efficiency of Stage II vapor recovery systems from 90 to 95 percent in those counties with existing Stage II requirements. Optionally, the control measures could be extended to counties that currently do not have Stage II vapor recovery requirements.

Measure SOLV7C – Require Add-on Control Devices on the UST Vent. This control measure is based on the use of an add-on control device (such as a membrane system, refrigeration unit, or carbon bed) to reduce vapor growth emissions from the UST vent by 90 percent. It will be applied in all 8-hr nonattainment counties. Optionally, the control measures could be extended to counties adjacent to 8-hr nonattainment areas counties in the MRPO region or to all counties in the region.

EXPECTED EMISSION REDUCTIONS

We calculated the approximate emission reductions expected from adopting the CARB EVR Stage I requirements and the continued phase-in of ORVR requirements in the following manner:

- Obtained 2002 actual emissions from the EPA's Draft 2002 NEI (Note: the LADCO 2002 inventory contained inconsistencies between states and did not have Stage II emissions from Ohio);
- Increased the Stage I overall reduction from uncontrolled in those counties with existing Stage I requirements from 72% (CE of 90%, RP of 80%) to 78.4% (CARB EVR CE of 98%, RP of 80%); applied a 78.4% (CARB EVR CE of 98%, RP of 80%) in all 8-hour nonattainment counties that do not currently have a Stage I requirement;
- Applied an incremental percent reduction for 2009 for ORVR vehicle refueling emissions in all counties using control factors recently developed by E.H. Pechan;
- Applied an incremental percent reduction of 50% for Stage II emissions in those counties with existing Stage II requirements (changing CE from existing 90% to 95% required by CARB EVR Module 2) on top of the reductions obtained from ORVR;
- Apply a 90 percent reduction to underground storage tank (UST) breathing and emptying emissions.

Current emissions from gasoline distribution facilities and the expected emission reductions from the candidate control measure are summarized in Table 2.

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TABLE 2 – COMPARISON OF 2002 VOC EMISSIONS (tpy) AND 2009 PROJECTED EMISSIONS

State	Counties	Measure SOLV7A - Adopt CARB Stage I Enhanced Vapor Recovery			On-the-Books Measure – Continue Phase-in of Stage II Onboard Vapor Recovery (ORVR)			Measure SOLV7B – OBVR plus Upgrade Existing Stage II to CARB EVR and Add CARB Stage II EVR to All Areas		Measure SOLV7C – Require Air Pollution Control Device for UST Vent		
		2002	2009 Reduction	2009 Remaining	2002	2009 Reduction	2009 Remaining	2009 Reduction	2009 Remaining	2002	2009 Reduction	2009 Remaining
IL	Nonattainment	1,130	881	249	2,693	1,160	1,533	2,097	596	858	618	240
	Adjacent	188	147	41	1,484	798	686	1,387	96	286	206	80
	Not adjacent	<u>599</u>	<u>467</u>	<u>132</u>	<u>4,826</u>	<u>2,595</u>	<u>2,232</u>	<u>4,514</u>	<u>312</u>	<u>799</u>	<u>575</u>	<u>224</u>
	Total	1,917	1,495	422	9,002	4,552	4,451	7,998	1,005	1,943	1,399	544
IN	Nonattainment	4,247	3,313	934	5,346	2,811	2,534	4,948	398	534	385	150
	Adjacent	6,455	5,035	1,420	3,659	1,953	1,706	3,420	239	1,388	999	389
	Not adjacent	<u>1,978</u>	<u>1,543</u>	<u>435</u>	<u>1,081</u>	<u>577</u>	<u>504</u>	<u>1,010</u>	<u>71</u>	<u>257</u>	<u>185</u>	<u>72</u>
	Total	12,680	9,890	2,790	10,085	5,341	4,744	9,378	707	2,180	1,569	610
MI	Nonattainment	4,824	3,763	1,061	11,360	6,086	5,274	10,622	738	1,676	1,207	469
	Adjacent	1,564	1,220	344	1,690	905	785	1,580	110	748	538	209
	Not adjacent	<u>1,795</u>	<u>1,400</u>	<u>395</u>	<u>1,594</u>	<u>854</u>	<u>741</u>	<u>1,491</u>	<u>104</u>	<u>680</u>	<u>489</u>	<u>190</u>
	Total	8,183	6,383	1,800	14,645	7,845	6,800	13,693	952	3,104	2,235	869
OH	Nonattainment	5,628	4,390	1,238	2,932	1,315	1,617	2,318	614	754	543	211
	Adjacent	6,059	4,726	1,333	770	418	352	721	49	891	642	250
	Not adjacent	<u>1,328</u>	<u>1,035</u>	<u>292</u>	<u>178</u>	<u>96</u>	<u>81</u>	<u>166</u>	<u>11</u>	<u>381</u>	<u>274</u>	<u>107</u>
	Total	13,015	10,152	2,863	3,879	1,829	2,050	3,204	675	2,026	1,458	567
WI	Nonattainment	315	0	315	882	343	539	365	517	83	60	23
	Adjacent	268	0	268	2,559	1,377	1,182	2,394	166	330	238	93
	Not adjacent	<u>6,085</u>	<u>4,746</u>	<u>1,339</u>	<u>3,762</u>	<u>2,024</u>	<u>1,738</u>	<u>3,519</u>	<u>243</u>	<u>529</u>	<u>381</u>	<u>148</u>
	Total	6,668	4,746	1,921	7,203	3,744	3,459	6,277	926	942	679	264
MRPO	Nonattainment	16,145	12,347	3,798	23,213	11,716	11,497	20,349	2,864	3,904	2,811	1,093
	Adjacent	14,534	11,128	3,406	10,161	5,450	4,711	9,501	659	3,644	2,624	1,020
	Not adjacent	<u>11,784</u>	<u>9,192</u>	<u>2,593</u>	<u>11,441</u>	<u>6,146</u>	<u>5,295</u>	<u>10,700</u>	<u>741</u>	<u>2,646</u>	<u>1,905</u>	<u>741</u>
	Total	42,463	32,666	9,796	44,815	23,312	21,503	40,550	4,265	10,194	7,340	2,854

Notes: The 2009 emission estimates presented here are not growth-adjusted.
The 2009 reductions are from the base year 2002 estimates.

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TIMING OF IMPLEMENTATION

For the purposes of this White Paper, we have assumed that SIP rules would be adopted in early 2007. If the MRPO states chose to adopt the CARB EVR requirements for Stage I and II, a four-year window is provided for existing facilities to upgrade equipment to meet the new standards. Thus, emission reductions would not occur until 2011 for Measures SOLV7A and SOLV7B.

COST EFFECTIVENESS AND BASIS

CARB (Reference 12) estimated the cost effectiveness of upgrading existing systems to meet Phase I of the EVR program to be \$7,640 per ton of VOC reduced, with the costs for low capacity facilities about three times more costly than for an average sized facility. For stations without Stage I vapor recovery systems, the cost effectiveness of new systems is estimated to be between \$100 to \$4,742, depending on the size of the station (Reference 8).

CARB (Reference 12) estimated the cost effectiveness of upgrading existing systems to meet Phase II of the EVR program to be \$36,260 per ton of VOC reduced, with the costs for low capacity facilities about three times more costly than for an average sized facility. For stations without Stage II vapor recovery systems, the cost effectiveness of new systems is estimated to be about \$13,400 in 2009, and rises to \$28,500 by 2015 (Reference 10).

For underground storage tank breathing losses, commercially available membrane vapor recovery systems are said to pay for itself with the value of the recovered gasoline.

RULE DEVELOPMENT ISSUES

EPA has not yet issued final rules for implementing the RACT/RACM provisions associated with the 8-hour ozone SIPs. The proposed implementation rule contained different options for residual 1-hour areas and 8-hour basic, marginal, and moderate areas. For ozone nonattainment areas, States can work from existing authority under state and federal law. States may need additional authority to impose VOC RACT/RACM requirements outside on nonattainment areas.

GEOGRAPHIC APPLICABILITY

We developed two options for geographic applicability for the candidate control measures. The first option is to apply the candidate control measure only in those counties designated as nonattainment for the 8-hr ozone standard. The second option is to apply the candidate control measures to both nonattainment counties and all counties that are adjacent to a nonattainment county. The continued phase-on of vehicles with ORVR will result in emission reductions in all counties.

TEMPORAL APPLICABILITY

Emission reductions would be realized throughout the year.

AFFECTED SCCs

Area source SCCs affected by this control measure include:

2501060050 Stage I Total

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2501060051	Stage I Submerged Filling
2501060052	Stage I Splash Filling
2501060053	Stage I Balanced Submerged Filling
2501060100	Stage II Total
2501060101	Stage II Uncontrolled
2501060102	Stage II Controlled
2501060103	Stage II Spillage
2501060201	Underground Storage Tank Breathing and Emptying

REFERENCES

1. STAPPA/ALAPCO. *Meeting the 15-Percent Rate-of-Progress Requirement Under the Clean Air Act: A Menu of Options*. September 1993.
2. Eastern Research Group. *Emission Inventory Improvement Program, Gasoline Marketing (Stage I and Stage II), Volume III, Chapter 11*. January 2001.
3. U.S. EPA. *Stage II Vapor Recovery Systems Issues Paper*. August 12, 2004.
4. U.S. EPA. *Request for Review/Comment on EPA Plans for Final 2002 NEI for Gasoline Distribution Emissions*. Memo from Laurel Driver, U.S. EPA, to State/local Agencies. February 2005.
5. New Jersey Department of Environmental Protection. *Economic Impact Analysis and Estimated VOC Reductions for Proposed Amendments to the Gasoline Transfer Operation Provisions at NJAC 7:27-16.3*. March 28, 2002.
6. California Air Resources Board. *Initial Statement of Reasons for the Proposed Amendments to the Vapor Recovery Certification and Test Procedures for Gasoline Loading and Motor Vehicle Refueling at Service Stations*. February 4, 2000.
7. E.H. Pechan and Associates. *Growth/Control Factor Revisions Since Delivery of "Final" December 2004 Files*. Memo describing control factors for Stage II vehicle refueling emissions. February 2005.
8. U.S. EPA. *Gasoline Distribution Industry (Stage I) – Background Information for Proposed Standards, EPA-453/R-94-002a*. January 1994.
9. U.S. EPA. *Technical Guidance – Stage II Vapor Recovery Systems for Control of Vehicle Refueling Emissions at Gasoline Dispensing Facilities, EPA-450/3-91-022a*. November 1991.
10. American Petroleum Institute. *Cost Benefit Analysis for Stage II VRS Control in the Knoxville EAC Area*. April 15, 2004.
11. American Petroleum Institute. *Stage II Vapor Recovery System Operations & System Installation Costs*. August 2002.
12. California Air Resources Board. *Staff Report: Enhanced Vapor Recovery Technology Review*. October 2002.
13. California Air Resources Board. September 1, 204 letter regarding Executive Order G-70-205: Modification of Enhanced Vapor Recovery (EVR) Phass II Operative Dates Relating to the Finding that EVR Phase II Vapor Recovery Systems are not Commercially Available.

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Attachment 1 - Comparison of RACT Regulations

CTG Category: Stage I Vapor Control Systems – Gasoline Service Stations	
CTG RACT Recommendation: provides design criteria to achieve submerged fill, vapor return lines sized and free of restrictions to allow transfer of vapor to the delivery truck, no leaks in system that would inhibit vapor transfer to the delivery truck, and assure proper use of the vapor return line during deliveries.	
LADCO States	
Illinois – Subpart 215.583 (State) Subpart 218.583 (Chicago), and 219.583 (Metro East) Gasoline dispensing Facilities - Storage Tank filling Operations	Applicability: Statewide Control Requirement: requires submerged fill and a vapor collection system for vapor displaced during tank filling Exemptions: <ol style="list-style-type: none"> (1) all tanks less than 575 gallons (2) all tanks less than 2,000 gallons that were operating prior to 1/1979 (3) all tanks with floating roofs or equivalent controls (4) In Chicago and Metro East only, pressure/vacuum relief vents on subject tanks.
Indiana – 326 IAC 8-4-6 Gasoline Dispensing Facilities	Applicability: only in Clark, Elkhart, Floyd, Hendricks, Lake, Marion, Porter, St. Joseph, Boone, Dearborn, Hamilton, Hancock, Harrison, Johnson, Morgan, Shelby, and Vanderburgh Counties and all new tanks installed after 7/1989 at gasoline dispensing facilities with monthly throughputs 10,000 gallons and greater Control Requirements: <ol style="list-style-type: none"> 1) submerged fill, pressure relief valves, and vapor balance systems for gasoline dispensing facilities with monthly throughputs 10,000 gallons and greater and “independent small business marketers of gasoline” with monthly throughputs 50,000 gallons and greater 2) in Clark, Floyd, Lake, and Porter counties must use a “CARB certified” (95% control by weight) vapor collection and control system.

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CTG Category: Stage I Vapor Control Systems – Gasoline Service Stations	
Michigan – 336.1606 Loading Gasoline into Existing Stationary Vessels & 1703 Loading Gasoline into New Stationary Vessels	<p>Applicability: Statewide tanks greater than 2,000 gallon capacity at gasoline dispensing facilities</p> <p>Control Requirements:</p> <ol style="list-style-type: none"> 1) submerged fill in tanks at gasoline dispensing facilities handling more than 250,000 gallons per year 2) in 38 listed counties, vapor balance system or equivalent capable of returning 90% or more of the vapor to the delivery truck at existing gasoline dispensing facilities handling more than 250,000 gallons per year and for new tanks installed after 7/1/1979 at new or existing gasoline dispensing facilities
Ohio – 3745-21- 09 (R) Gasoline Dispensing Facilities	<p>Applicability: gasoline dispensing facilities with annual throughputs of 120,000 gallons and greater located in 24 listed counties or anywhere in the State if installed after 10/19/1979 or at facility with potential emissions of 100 tons per year VOC</p> <p>Control Requirements: submerged fill and 90% effective vapor balance or vapor control system</p> <p>Exemptions: floating roof tanks</p>
Wisconsin – 420.04 (3) Gasoline Dispensing Facilities	<p>Applicability: counties of Brown, Calumet, Dane, Dodge, Door, Fond du Lac, Jefferson, Kenosha, Kewaunee, Manitowoc, Milwaukee, Outagamie, Ozaukee, Racine, Rock, Sheboygan, Walworth, Washington, Waukesha, and Winnebago</p> <p>Control Requirements: submerged fill and vapor balance or 90% effective vapor control system</p> <p>Exemptions</p> <ol style="list-style-type: none"> 1) tanks less than 575 gallons 2) tanks less than 2,000 gallons that were in place prior to 8/1/1979 3) tanks with floating roofs or equivalent controls
Other States	
California – Bay Area – Rule 7 – Gasoline Dispensing Facilities	<p>Applicability: District-wide</p> <p>Control Requirements: submerged fill pipe and “CARB Certified” vapor recovery system (98% volumetric efficiency).</p> <p>Exemptions:</p> <ol style="list-style-type: none"> 1) tanks less than 250 gallons 2) agriculture-related (implements of husbandry) tanks less than 550 gallons

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CTG Category: Stage I Vapor Control Systems – Gasoline Service Stations	
California – South Coast Rule 461 – Gasoline Transferring and Dispensing	<p>Applicability: District-wide</p> <p>Control Requirements: “CARB Certified” submerged fill tube and “CARB Certified” 95 % effective vapor recovery system or 98% volumetric efficiency achieving 0.15 lbs/1000 gallon emission factor,</p> <p>Exemptions: stationary tanks less than 251 gallons and mobile tanks 120 gallons and smaller</p>
Maryland – 26.11.13.03 Large Storage Tanks and .04 Loading Operations	<p>Applicability: Statewide</p> <p>Control Requirements:</p> <ol style="list-style-type: none"> 1) gasoline stored in tanks 40,000 gallon or greater must have an internal floating roof, vapor control system, or pressure tank system 2) gasoline storage tanks between 2,000 gallons and 40,000 gallons must be equipped with vapor balance line <p>Exemptions: tanks less than 2,000 gallons</p>
Massachusetts – 310 CMR 7.24(1) Organic Material Storage Tanks & (3) Distribution of Motor Fuel	<p>Applicability: Statewide</p> <p>Control Requirements:</p> <ol style="list-style-type: none"> 1) gasoline stored in tanks 40,000 gallon or greater must have a submerged fill pipe and a floating roof, vapor control system, or pressure tank system 2) gasoline storage tanks between 2,000 gallons and 40,000 gallons must have submerged pipe fill and be equipped with vapor balance line 3) gasoline storage tanks greater than 250 gallons must have submerged pipe fill
New Jersey – 7.27-16.3 Gasoline Transfer Operations	<p>Applicability: Statewide</p> <p>Control Requirements:</p> <ol style="list-style-type: none"> 1) submerged fill required for 2,000 gallon and greater tanks installed before 12/17/1979 2) a floating roof or “CARB Certified”, 98% control by volume, vapor control system and pressure/vacuum relief vents required for tanks 2,000 gallon and greater

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