Gasoline Dispensing Facility
Vapor Recovery System Rulemaking 2022
Technical Advisory Committee
DEQ Air Quality Planning

March 30, 2022
Remotely Held Meeting

Introductions

- Hello and welcome

- Introductions
  - DEQ Staff & Facilitator
  - Technical Advisory Committee members
  - Rulemaking Advisory Committee members (if present)

- Purpose of meeting

Rulemaking Resources

https://www.oregon.gov/deq/rulemaking/Pages/GDF2022.aspx

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Agenda

Time	Topic
2 p.m.	Welcome and introductions
2:10 p.m.	Technical Advisory Committee Business
2:20 p.m.	DEQ presentation
2:40 p.m.	Discussion
3:45 p.m.	Public Input (if time allows)
3:55 p.m.	Next Steps
4 p.m.	Adjourn meeting

Technical Advisory Committee Charter

- Review
- Questions

Scope for Committee Consideration

- Range of vapor control options
  - Costs
  - Benefits/impacts
  - Technical feasibility
  - Converting controls
- Timelines
- Applicability Criteria

Advisory Committee Schedule

- One TAC meeting
- 3 Rulemaking Advisory Committee Meetings
  - Different but overlapping committee members

Why this rulemaking?

- Stage I regulations in effect state-wide
  - Oregon Administrative Rules (OAR) 340-244-0232 through OAR 340-244-0252
  - Rules from 2008
  - Updates in vapor controls – USTs and ASTs

- Stage II regulations / SIP
  - OAR 340-242-0500 through OAR 340-242-0520
  - https://www.oregon.gov/deq/FilterDocs/portlandSalemOzone.pdf
  - Some incompatibility with on-board vehicle systems
  - Updates in vapor controls

Vapor Concerns from GDFs

GDF = Gasoline Dispensing Facility (Gas Station)

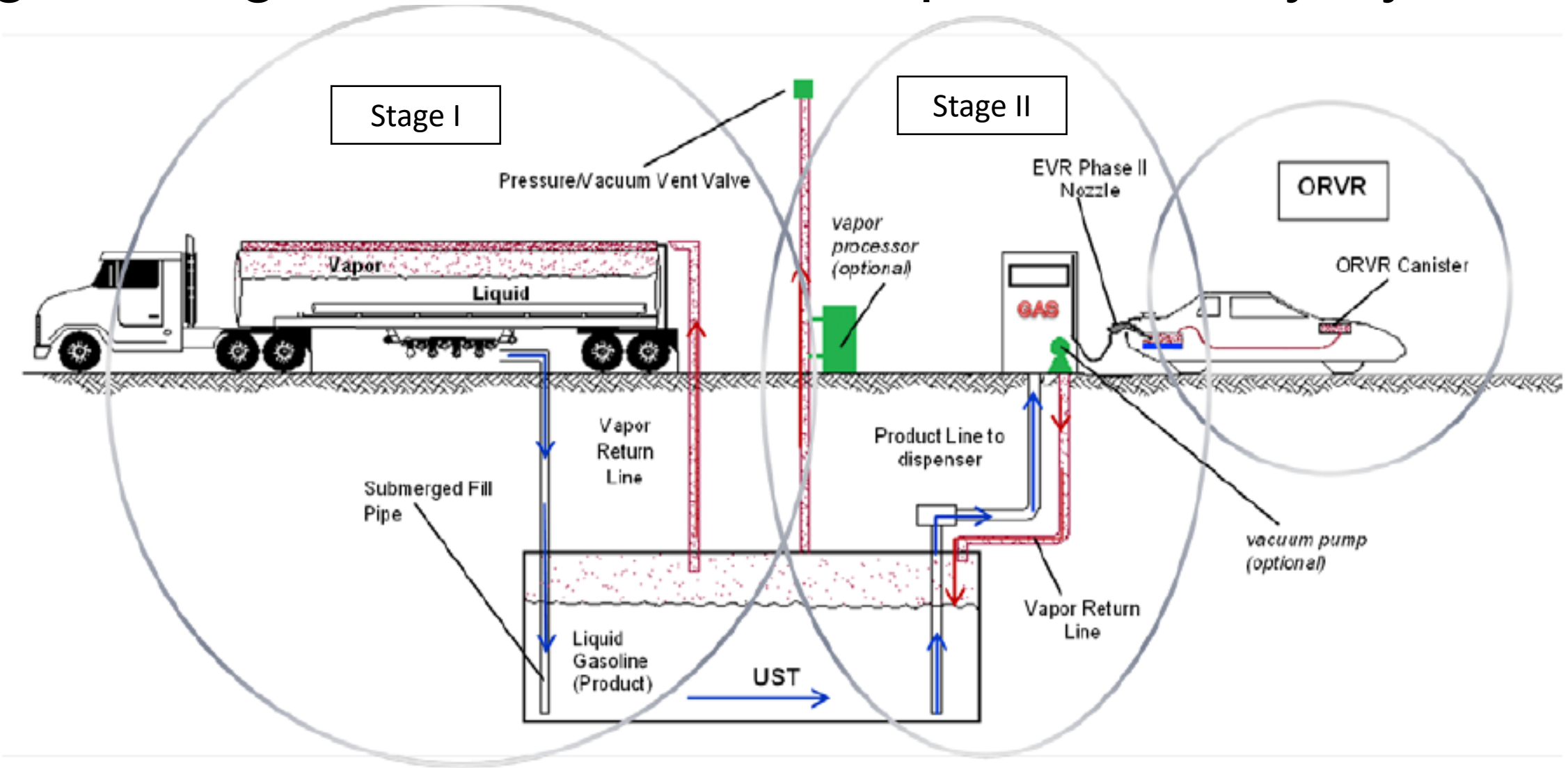
Vapors

- Ozone Precursors
  - VOCs, NO_x
- Hazardous Air Pollutants (toxics)
  - Benzene, etc.

Sources

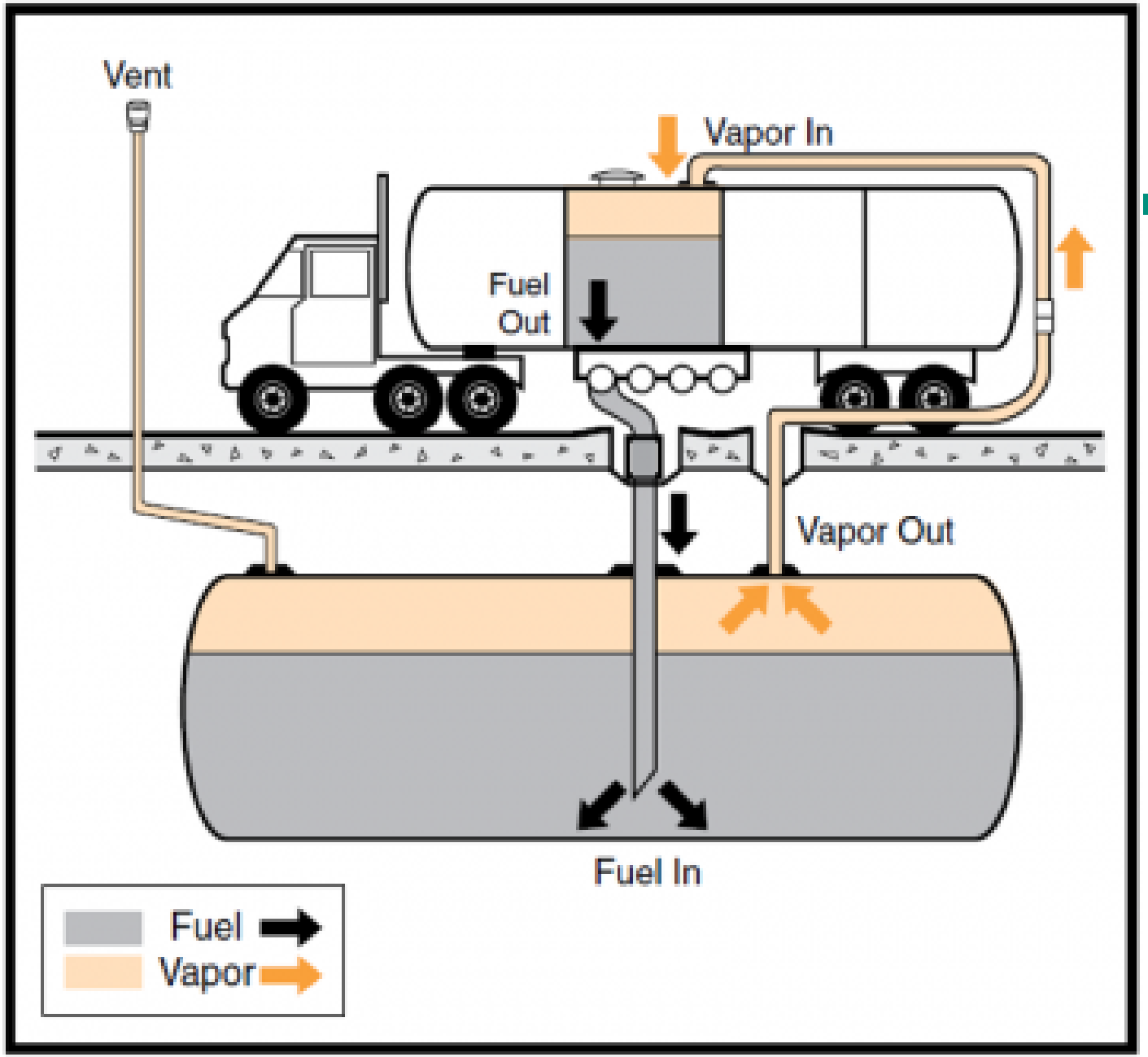
- Stage I (Tanker to UST)
- Stage II (Vehicle Refueling)

Stage I, Stage II, and On Board Vapor Recovery Systems



Source: California Air Resources Board (edited by DEQ)

Stage I VRS



Source: Minnesota Pollution Control Agency

Stage I VRS

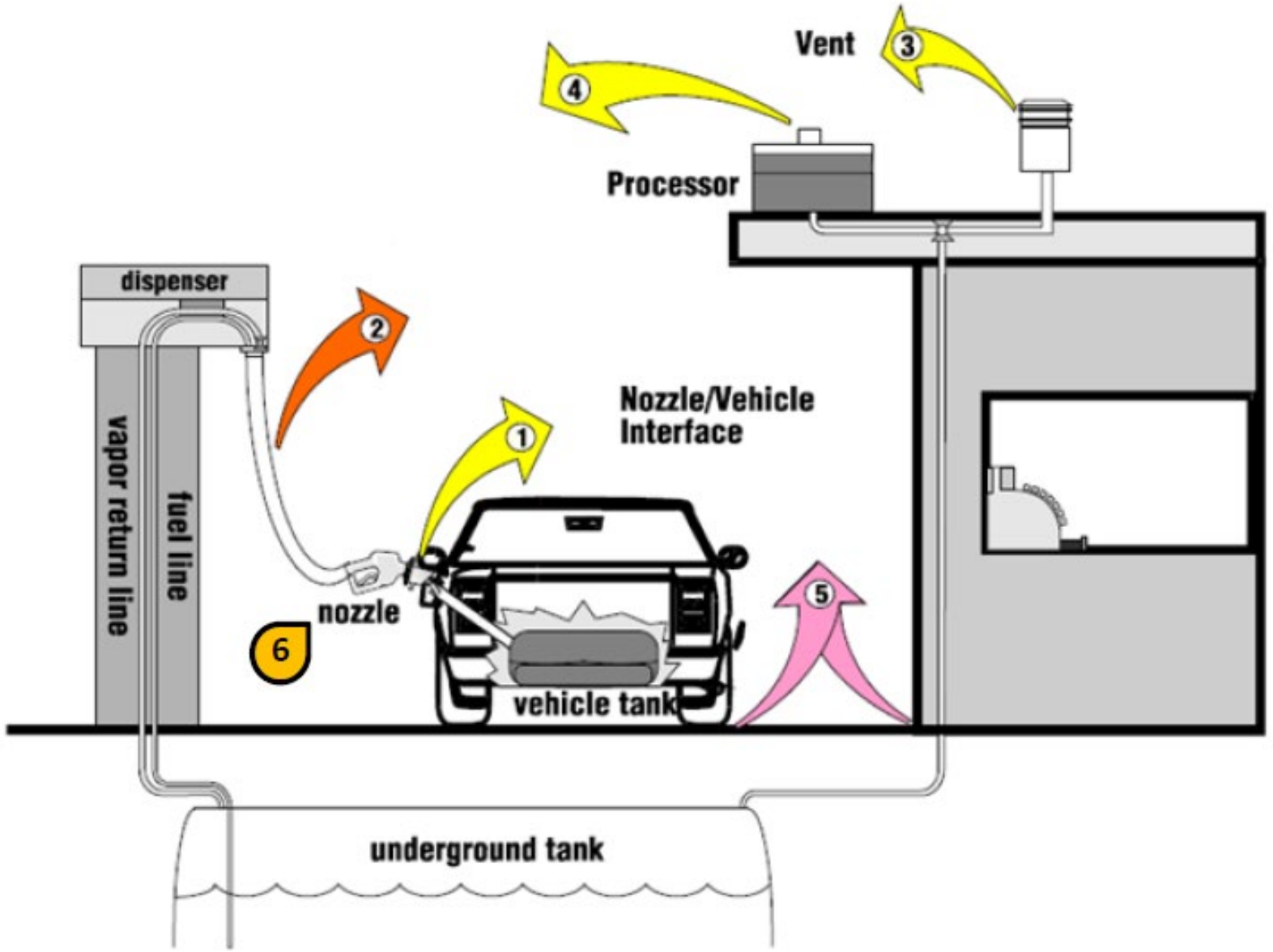
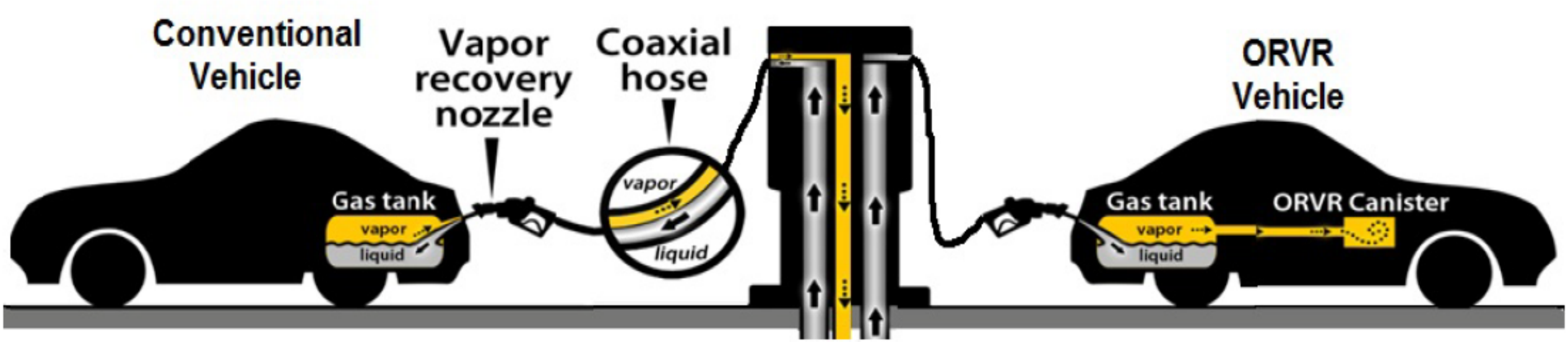
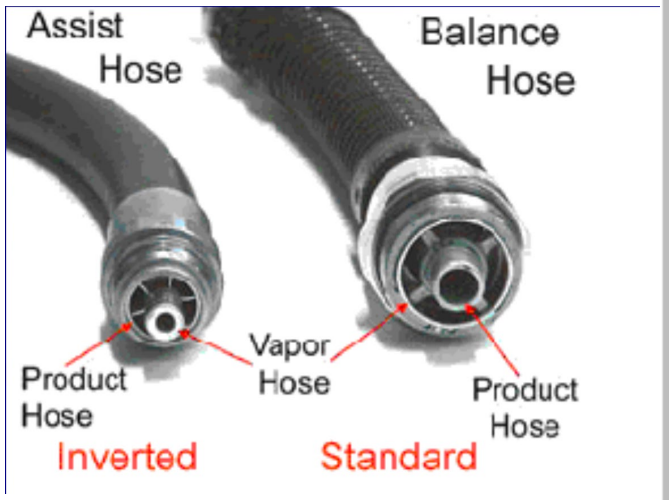


Figure ID	Emission Point
1	Vehicle fueling
2	Hose
3	Vent
4	Vapor Processor (optional)
5	Pressure driven
6	Nozzle

Source: California Air Resources Board





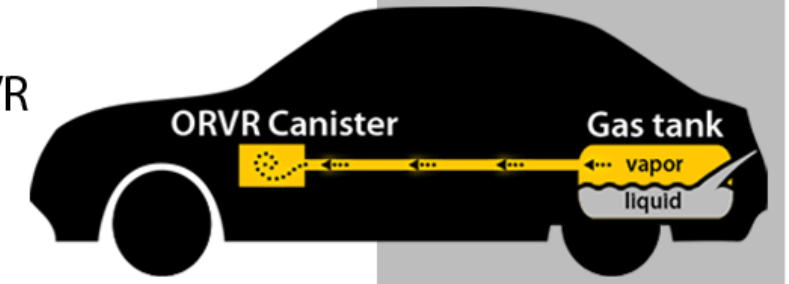
Source: California Air Resources Board

ORVR equipment

Federal legislation required EPA to adopt ORVR regulations for gasoline-powered vehicles.

1998: Began phasing in for new vehicles

2006: More than 99% of all new vehicles equipped



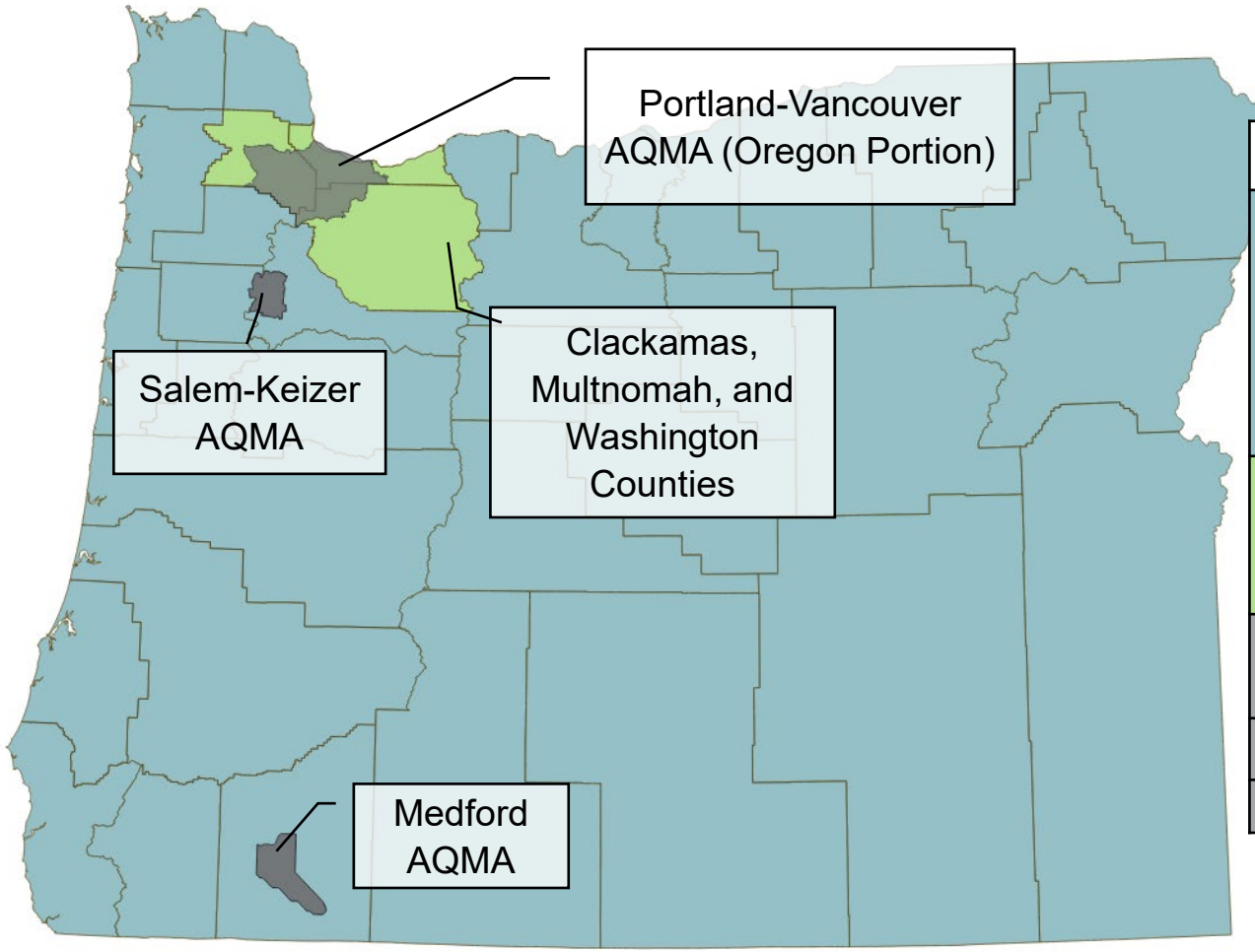
Vacuum assist nozzle

Some are incompatible with ORVR equipment and can actually cause a net increase in emissions.

Balance nozzle

Compatible with all ORVR equipment.

Stage I

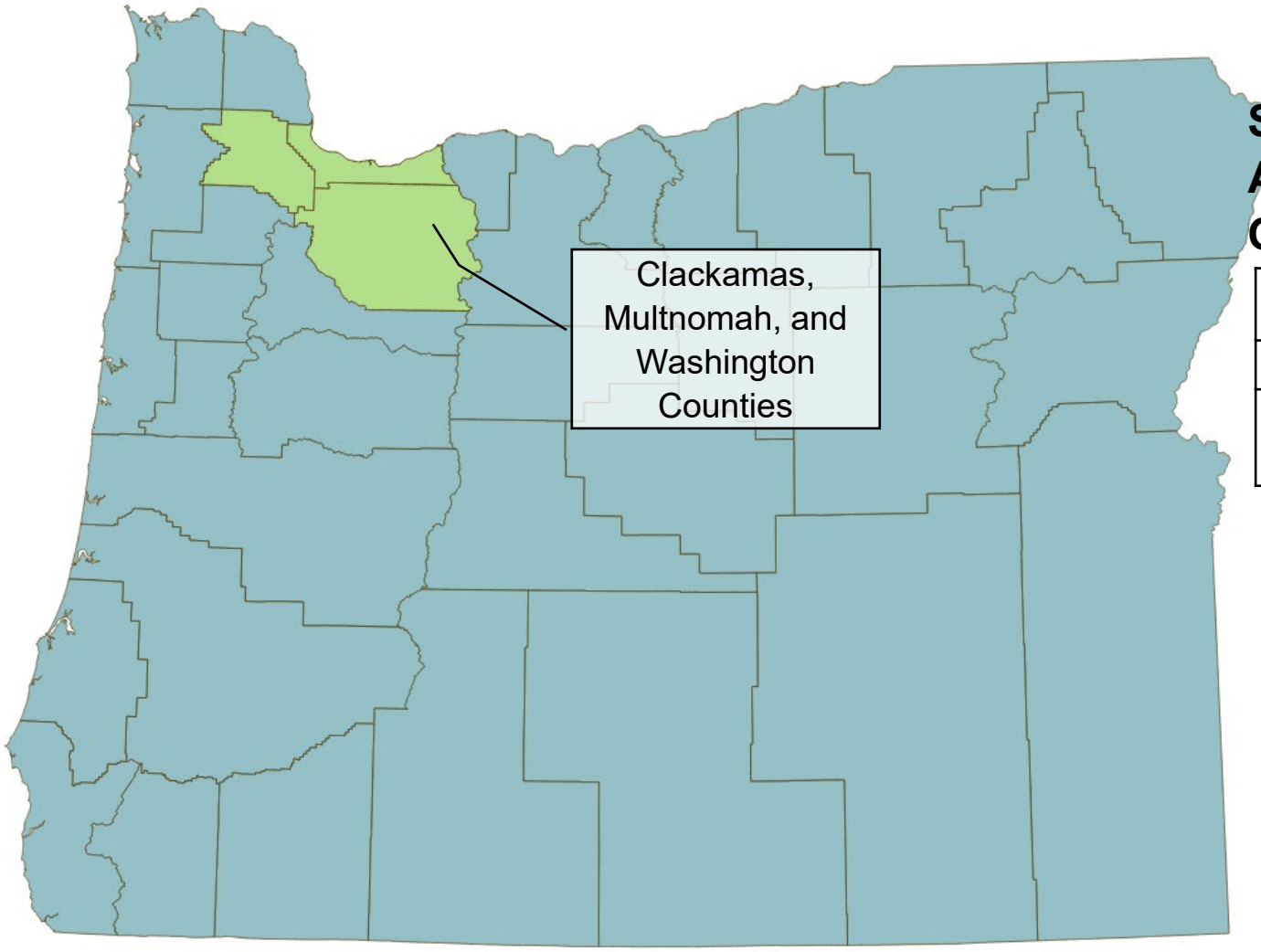


Stage I
General Permit: AQGP-022
Rules: OAR 340-244-0232 through OAR 340-244-0252

Area	Affected sources
State-wide	250 gallons or larger tanks with: • annual throughput: 480,000 gallons or more, or • monthly throughput: 100,000 gallons or more
Clackamas, Multnomah, and Washington Counties	All tanks with annual throughput of 120,000 gallons gasoline or more
Portland-Vancouver AQMA[1,2]	Tanks with a capacity of 1,500 gallons or more
Salem-Keizer AQMA	
Medford AQMA	

AQMA = Air Quality Management Area
1. https://www.oregon.gov/deq/FilterDocs/portlandSalemOzone.pdf
2. Oregon Portion

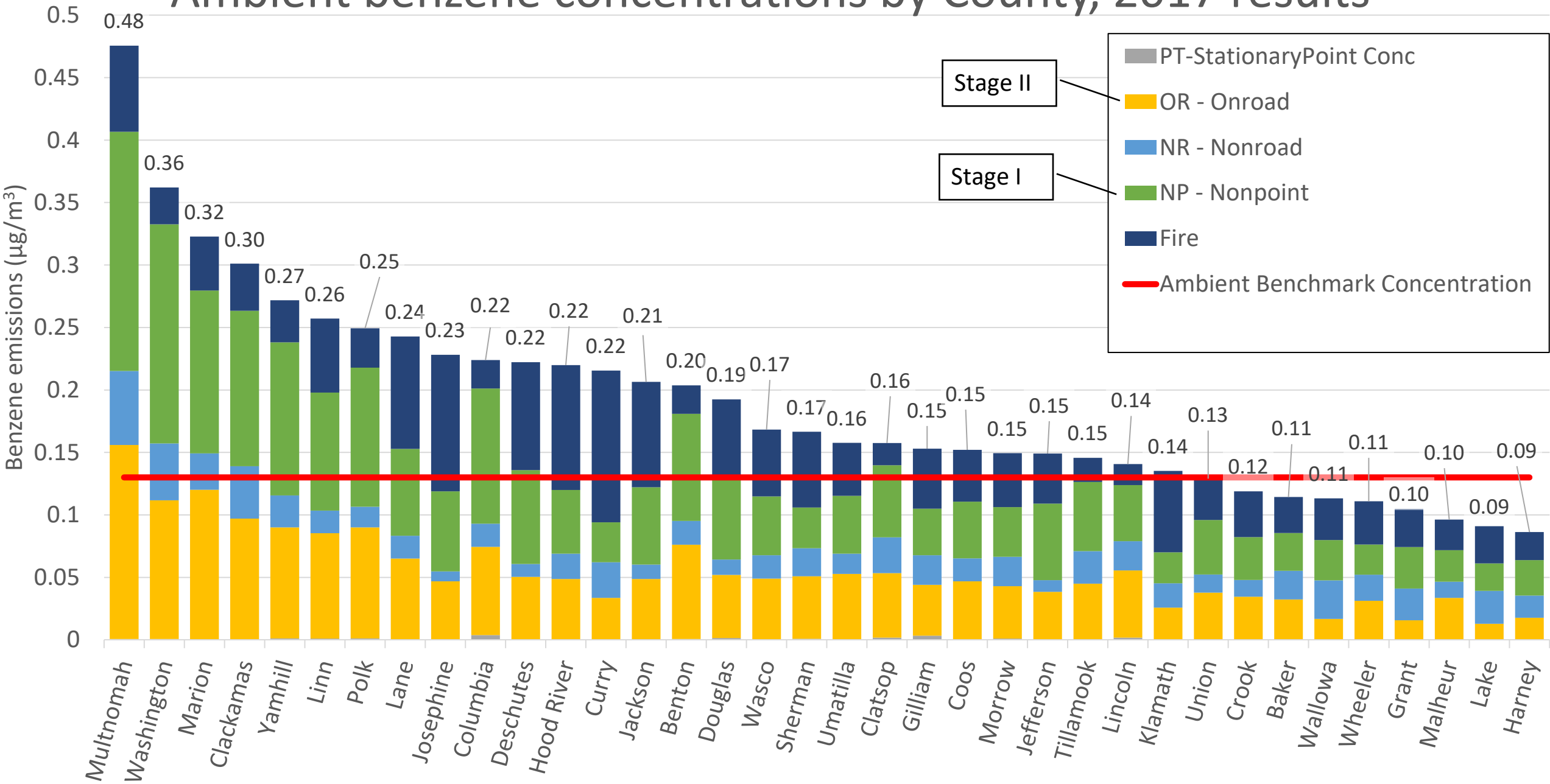
Stage II



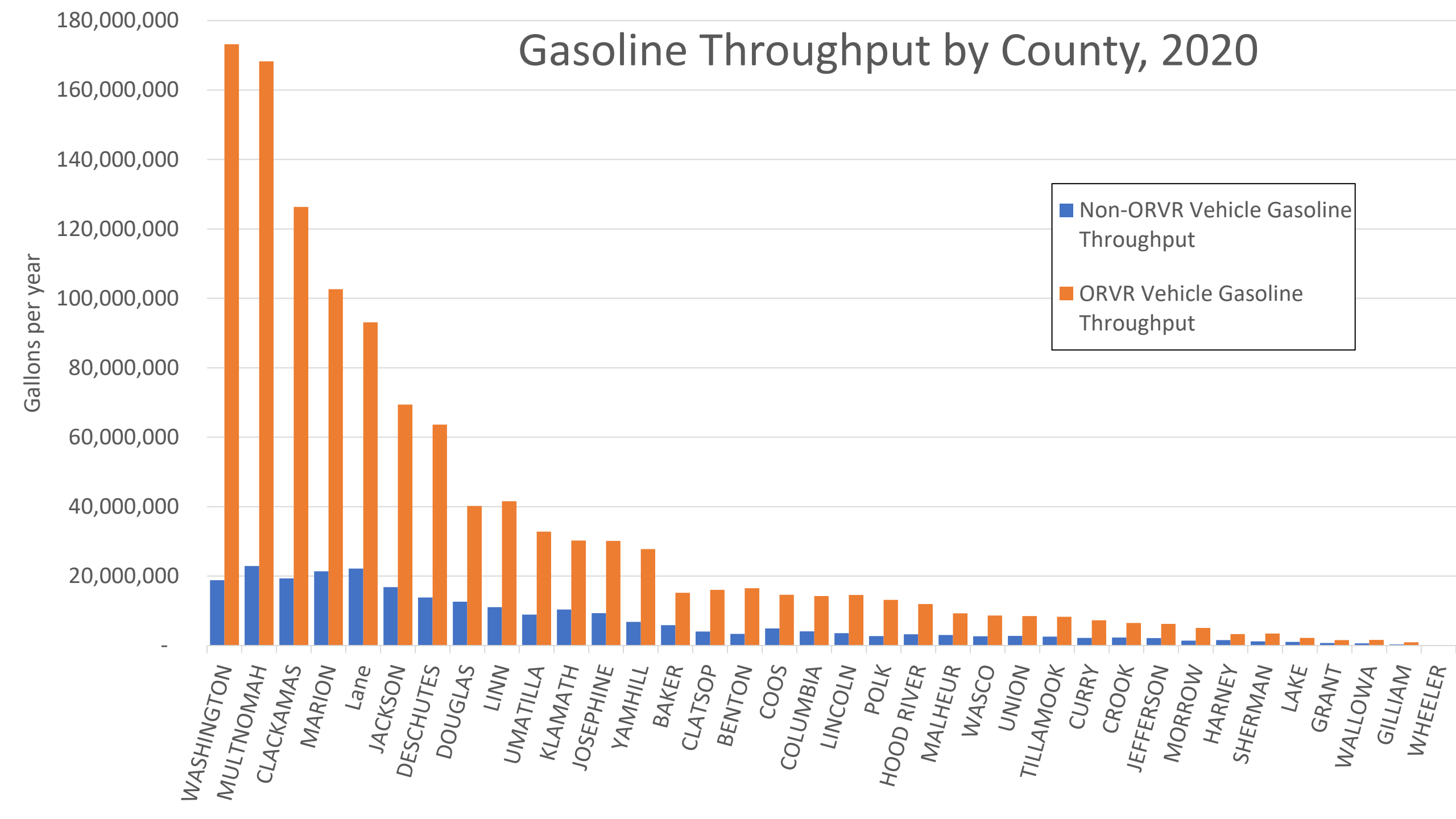
Stage II
AQGP-023
OAR 340-242-0500 through OAR 340-242-0520

Area	Affected sources
State-wide	NA
Clackamas, Multnomah, and Washington Counties	Annual throughputs: 600,000 gallons or more

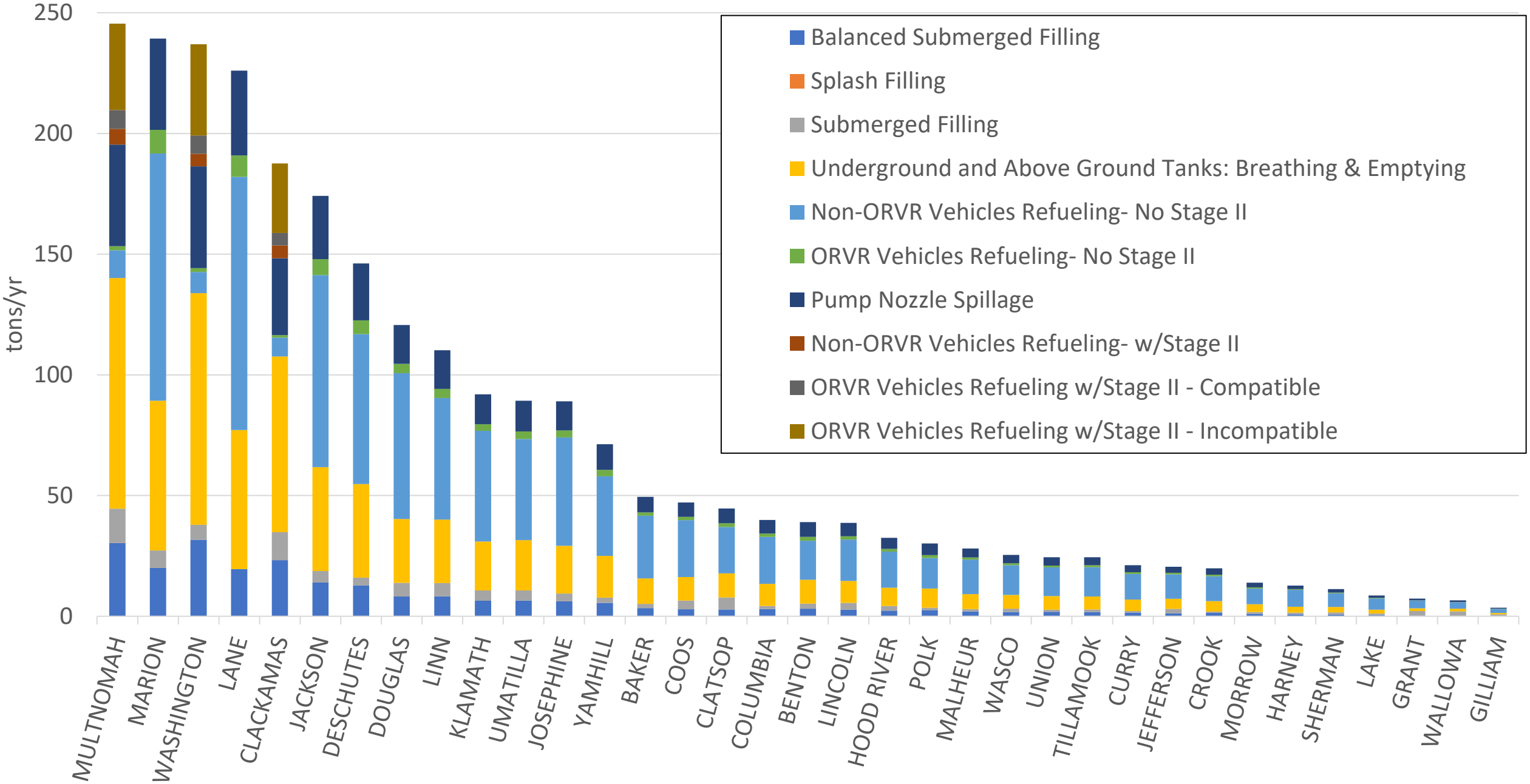
Ambient benzene concentrations by County, 2017 results



Source: EPA National Air Toxics Assessment


Gasoline Throughput by County, 2020
Gallons per year
180,000,000
160,000,000
140,000,000
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
-
Non-ORVR Vehicle Gasoline Throughput
ORVR Vehicle Gasoline Throughput
WASHINGTON
MULTNOMAH
CLACKAMAS
MARION
Lane
JACKSON
DESCHUTES
DOUGLAS
LINN
UMATILLA
KLAMATH
JOSEPHINE
YAMHILL
BAKER
CLATSOP
BENTON
COOS
COLUMBIA
LINCOLN
POLK
HOOD RIVER
MALHEUR
WASCO
UNION
TILLAMOOK
CURRY
CROOK
JEFFERSON
MORROW
HARNEY
SHERMAN
LAKE
GRANT
WALLOWA
GILLIAM
WHEELER

VOC emissions by GDF activity and county, 2020



VOCs controlled by Stage II VRS Clackamas, Multnomah, Washington Counties

Scenario	Emission Factor (lbs/1000 gal)	Approximate Throughput (gal/year)	Annual emissions (tons/year)	Emissions change due to Stage II (tons/year)	Notes
Non-ORVR Vehicles Refueling- No Stage II	8.7	6,400,000	28.0	--	
ORVR Vehicle - no Stage II	0.2	49,300,000	4.3	--	
Pump Nozzle Spillage - No Stage II	0.6	54,000,000	16.5	--	
ORVR Vehicle - Stage II and Compatible	0.2	234,600,000	20.5	--	
Non-ORVR Vehicle Stage II	0.6	56,500,000	17.0	229.95	Versus no Stage II
ORVR Vehicle - Stage II and Incompatible	1.0	198,600,000	102.4	-85.07	Versus compatible Stage II
Pump Nozzle Spillage - Stage II	0.4	214,800,000	45.1	99.73	Versus no Stage II

Enhanced Vapor Recovery

- Stage II EVR
  - Nozzles
    - Low drip
    - Dimensions
    - Liquid retention/spitting
    - ORVR Compatibility
  - Hoses
    - Low permeability
    - Configuration at GDF (one per dispenser side)
  - In-Station Diagnostics
- Stage I EVR
  - Specialized connections, fittings, and product adaptors
  - Integrated drain bucket, drop tube and drain valve
  - P/V valves
  - Fuel blend compatibility
  - Drop-tubes with over-fill prevention

California - Stage I EVR Performance Standards and Specifications

Performance Type	Requirement
Stage I Efficiency	≥ 98.0%
Stage I Emission Factor	HC ≤ 0.15 pounds/1,000 gallons
Static Pressure Performance	See CP-201
Pressure Integrity of Drop-Tube with Overfill Prevention	≤ 0.17 CFH at 2.0 inches H2O
Stage I Product and Vapor Adaptor/Delivery Elbow Connections	Rotatable 360°, or equivalent
Stage I Product Adaptor Cam and Groove	See CP-201
Stage I Vapor Recovery Adaptor Cam and Groove	CID A-A-59326
Stage I Vapor Adaptor	Poppetted
Stage I Vapor Adaptor	No Indication of Leaks
Stage I Product and Vapor Adaptors	≤ 108 pound-inch (9 pound-foot) Static Torque
UST Vent Pipe Pressure/Vacuum Valves	2.5 to 6.0 inches H2O Positive Pressure 6.0 to 10.0 inches H2O Negative Pressure Leakrate at +2.0 inches H2O ≤ 0.17 CFH Leakrate at -4.0 inches H2O ≤ 0.63 CFH
Spill Container Drain Valves	Leakrate ≤ 0.17 CFH at +2.0 inches H2O
Vapor Connectors and Fittings	No Indication of Leaks
Compatibility with Fuel Blends	Materials shall be compatible with approved fuel blends

Vapor Recovery Phase I EVR Executive Orders

CATEGORIES

Programs Vapor Recovery

Type Link

CONTACT

Vapor Recovery Program Email

Email vapor@arb.ca.gov

Phone (916) 327-0900

Number	Description
VR-101	Phil-Tite Phase I Vapor Recovery System
VR-102	OPW Phase I Vapor Recovery System
VR-103	EBW Phase I Vapor Recovery System
VR-104	CNI Manufacturing Phase I Vapor Recovery System
VR-105	EMCO Wheaton Retail Phase I Vapor Recovery System

https://ww2.arb.ca.gov/resources/documents/vapor-recovery-phase-i-evr-executive-orders

California Stage II EVR Performance Standards and Specifications

Performance Type	Requirement
Stage II Emission Factor Includes: • Refueling and Vent Emissions • Pressure-Related Fugitives	Summer Fuel: 95% Efficiency *and* HC ≤ 0.38 lbs/kgal Winter Fuel: 95% Efficiency *or* HC ≤ 0.38 lbs/kgal
Static Pressure Performance	See CP-201
Spillage Including Drips from Spout	≤ 0.24 pounds/1,000 gallons
ORVR Compatibility	Applicant shall develop test procedure
Liquid Retention Nozzle "Spitting"	≤ 100 ml/1,000 gallons ≤ 1.0 ml per nozzle per test
ISD	See CP-201
Low Permeation Hoses	Permeation Rate ≤ 10.0 $g/m^2/day$
Stage II Compatibility with Stage I Systems	See CP-201
UST Pressure Criteria (30 day rolling average)	Daily Average Pressure ≤ +0.25 in. H_2O Daily High Pressure ≤ +1.50 in. H_2O
Nozzle Criteria	• Post-Refueling Drips ≤ 3 Drops/Refueling • Comply with spout assembly dimensions • Be able to fuel any vehicle that can be fueled with a conventional nozzle
Nozzle/Dispenser Compatibility	• Vapor Check Valve Closed When Hung • Hold-open Latch Disengaged When Hung
Unihose MPD Configuration	One Hose/Nozzle per Dispenser Side

Vapor Recovery Phase II EVR Executive Orders

CATEGORIES

Programs Vapor Recovery

Type Link

CONTACT

Vapor Recovery Program Email

Email vapor@arb.ca.gov

Phone (916) 327-0900

https://ww2.arb.ca.gov/resources/documents/vapor-recovery-phase-ii-evr-executive-orders

Number	Description
VR-201	Assist Phase II EVR System
VR-202	Assist Phase II EVR System Including ISD System
VR-001	Franklin Electric, Inc. Acquisition of Healy System Executive Orders
VR-203	Balance Phase II EVR System
VR-204	Balance Phase II EVR System Including ISD System
VR-205	VST Phase II EVR System with HIRT VCS 100 Thermal Oxidizer not Including ISD
VR-207	EMCO Wheaton Retail Phase II EVR System with HIRT VCS 100 Thermal Oxidizer not Including ISD
VR-208	EMCO Wheaton Retail Phase II EVR System with HIRT VCS 100 Thermal Oxidizer Including ISD
VR-209	VST Phase II EVR System with FFS Clean Air Separator Not Including ISD
VR-210	Site Specific Certification of the Disneyland Resort Gasoline Dispensing Facility with Bulk Plant

Southwest Clean Air Agency

- Annual throughput
  - 360,000 gallons – Cowlitz, Lewis, Skamania, Wahkiakum counties
  - 200,000 gallons – Clark county
- Stage II decommissioning
- Stage II EVR components
  - Breakaway, low permeability hoses
  - Enhanced Conventional nozzles
- Stage I EVR systems
  - New tanks Stage I EVR or equivalent
  - EVR P/V valves all tanks
  - Regular testing OR continuous pressure monitoring system

Delaware

- Annual Throughput
  - 10,000 gallons
- Stage II decommissioning
  - By December 31, 2021
- Stage I EVR systems
  - Required for new tanks
  - Upgrade existing tanks to EVR
  - Monthly onsite inspection *or* Continuous Pressure Monitoring System

Discussion

- Range of vapor control options
  - Costs
  - Benefits/impacts
  - Technical feasibility of various vapor controls
- GDF Conversion
- Emission sources
- Timelines
- Applicability
  - Geographic area
  - Throughput
  - AQMA

Vapor control options

Please discuss concerns/benefits to the various controls available. This may include:

a. Costs effectiveness of controls ($/tons of pollution reduced)

b. Equipment breakage and maintenance costs

c. Which control devices are the most effective at controlling/reducing those emissions?

d. Do you have technical concerns with some of the options?

Conversion

Is it technically feasible for a ORVR non-compatible station to convert to a compatible one?

What are the technically difficulties in converting from Stage I to Stage I EVR

Emission Sources

Where do you think the biggest sources of emissions from GDFs are coming from?

Timing

- How much lead time do you recommend DEQ provide to GDFs to properly install various controls?

Applicability

The applicability of the current rules is based on geographic area of the state (areas with ozone concerns) and throughput. As we show in the presentation, benzene is a concern throughout most of the state. Should applicability of the GDF vapor emission rules be based on different criteria?

- Geographic area
- Throughput
- AQMA

Public Input

Next Steps

2 weeks additional input → Scenario evaluation → RAC Meetings April through August 2022

Thank you

https://www.oregon.gov/deq/rulemaking/Pages/GDF2022.aspx

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