

California Environmental Protection Agency

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# Workshop For 2013 Vapor Recovery Rulemaking

Enhanced Vapor Recovery (EVR)  
and  
Gasoline Cargo Tanks

April 23, 2012 - Sacramento

# Presentation Outline

1. Purpose / Context of Today's Workshop
2. 2013 EVR Regulatory Proposal
  - Enhanced Conventional (ECO) Nozzles for On-Board Refueling Vapor Recovery (ORVR) Fleet Fueling Facilities
  - Aboveground Storage Tank (AST) Certification Test Procedures
  - Cargo Tank Certification
3. Questions, Contact Information

# Purpose of Workshop

- Inform interested parties about proposed changes to vapor recovery program
- Solicit feedback on proposed changes
- Our Goal: Identify and resolve any issues before we present these amendments to our Board for adoption
- Board Hearing scheduled for July 2013

# Public Participation

**Public Workshops**  
Oct/Nov 2012, April 2013

**Rulemaking 45-day  
Comment Period**  
June 10 – July 25, 2013

**Board Hearing**  
July 25, 2013

## Informal Process

Present concepts and draft regulatory language

Solicit and consider stakeholder feedbacks on concepts and draft language

## Formal Process

Staff publishes the proposed regulatory change and provides reasons including costs and impact

Public may submit written or oral comments on staff's proposal to Board

## Final Stage

Staff formally presents proposal to Board

After considering all comments, Board accepts proposal, directs staff to address any remaining issues, or rejects proposal

# Vapor Recovery Program

- Vapor recovery program has been in place for over 35 years in California
- Staff is focused on improving the vapor recovery program by:
  1. Reducing operation and maintenance costs
  2. Implementing technical improvements
  3. Reducing emissions where practical and cost-effective

# Oct / Nov 2012 Workshops

- Short-term, mid-term, and long-term concepts for program improvement were presented.
- Some of the short-term measures are already being implemented:
  - ARB staff audit of manufacturer training
  - Mix & match of balance EVR components
  - Informational Bulletin issued regarding removal of In-Station Diagnostics (ISD) on stations under 600,000 gal. annual throughput
  - Online vapor recovery equipment complaint form

# The Next Steps...

- Mid-term items are in today's proposal
- Long-term items in late 2014 will include:
  - ISD overpressure alarm solution
    - Staff is revising proposal based on new data
    - Advisory 405-B remains in place
  - ISD software enhancements that will improve diagnostic capability and streamline or reduce compliance testing
  - Field test procedure improvements



# 2013 VAPOR RECOVERY REGULATORY PROPOSAL

# 2013 Regulatory Proposal

- **Enhanced Vapor Recovery (EVR) Proposal**
  - Adopt new standards for ECO Nozzles to be used at ORVR Fleet Fueling Facilities
  - Revise TP 201.1, Volumetric Efficiency of Phase I EVR
  - Revise TP 206.2, Emission Factor of Standing Loss Control Systems with Processors for ASTs
- **Cargo Tank Proposal**
  - Revise Cargo Tank Certification and Test Procedures



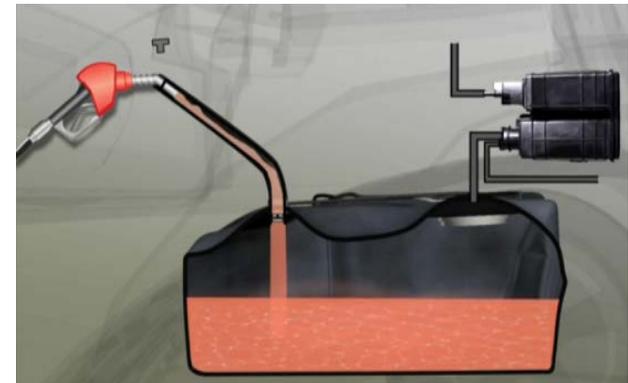
# Enhanced Conventional Nozzles (ECO Nozzles)

For Use at On-Board Refueling  
Vapor Recovery (ORVR)  
Fleet Fueling Facilities

# ORVR / Phase II Background

Two Control Systems Targeting the Same Emission Source: vapor displaced during vehicle fueling

1. [Phase II Vapor Recovery](#): gasoline dispensing facility (GDF) based, vapor returned to storage tank, uses coaxial nozzles and hoses, vapor return piping
2. [Onboard Refueling Vapor Recovery \(ORVR\)](#): vehicle based, vapor is captured in a carbon canister on the vehicle and later burned, no vapor for Phase II system to recover, federal requirement for vehicles after 1998

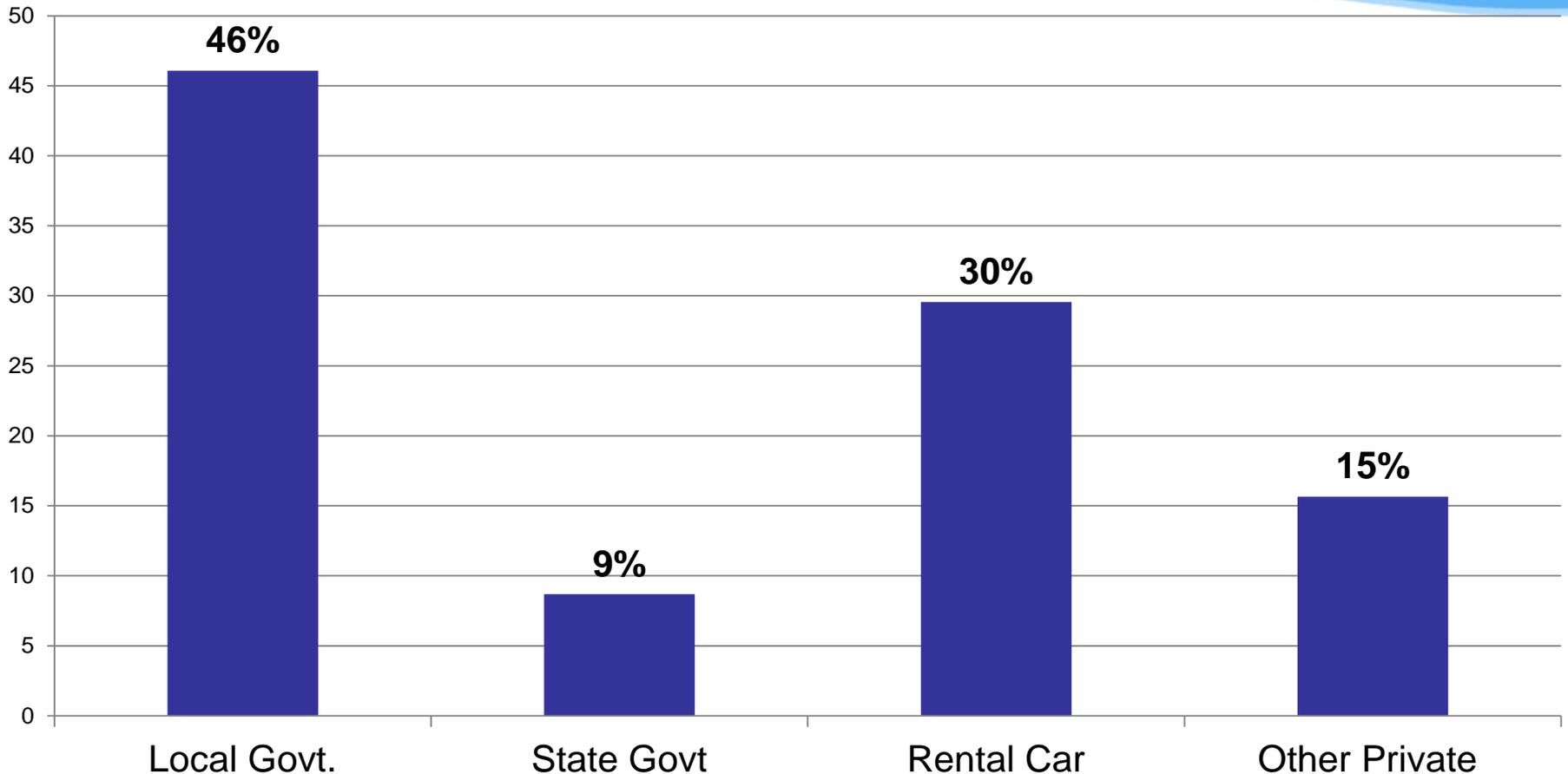


# ORVR Fleet Facilities

- Many Air Districts allow ORVR fleet GDFs to operate without Phase II Vapor Recovery
  - 2/20/2008 Letter from ARB to Air Districts
  - Consistent with U.S. EPA Memo
- Requires a fleet of 90% to 100% ORVR vehicles, depending on the district rule
- Applicable to non-retail facilities only
  - Car rental, government, or corporate fleets

# ORVR Fleet Facility Ownership

Ownership Percentage  
Based on data Provided by South Coast AQMD



# ECO Nozzles

- Since these facilities are exempt from Phase II Enhanced Vapor Recovery (EVR), what standards apply?
  - Conventional nozzle (no vapor return path)
  - Phase II EVR nozzle with vapor path capped
- New standards would provide statewide consistency, emission reductions, and cost savings

# ECO Nozzle Standards

<b>Performance Type</b>	<b>Requirement</b>	<b>Test Procedure</b>
<b>Nozzle Spillage</b>	<b><math>\leq 0.24</math> pounds/1,000 gallons</b>	<b>TP-201.2C</b>
<b>Post-Refueling Drips</b>	<b><math>\leq 3</math> Drops per Refueling</b>	<b>TP-201.2D</b>
<b>Liquid Retention</b>	<b><math>\leq 100</math> mL per 1,000 gallons</b>	<b>TP-201.2E</b>
<b>Nozzle Spitting</b>	<b><math>\leq 1.0</math> mL / nozzle / fueling</b>	<b>TP-201.2E</b>

# Comparison of Nozzle Controls

		Nozzle Type		
		Phase II EVR Nozzle	Conventional Nozzle	ECO Nozzle
Vehicle Type	ORVR	Liquid and Vapor Controls	Vapor Controls	Liquid and Vapor Controls
	Non-ORVR	Liquid and Vapor Controls	No Liquid or Vapor Controls	Liquid Controls

# ECO Nozzle

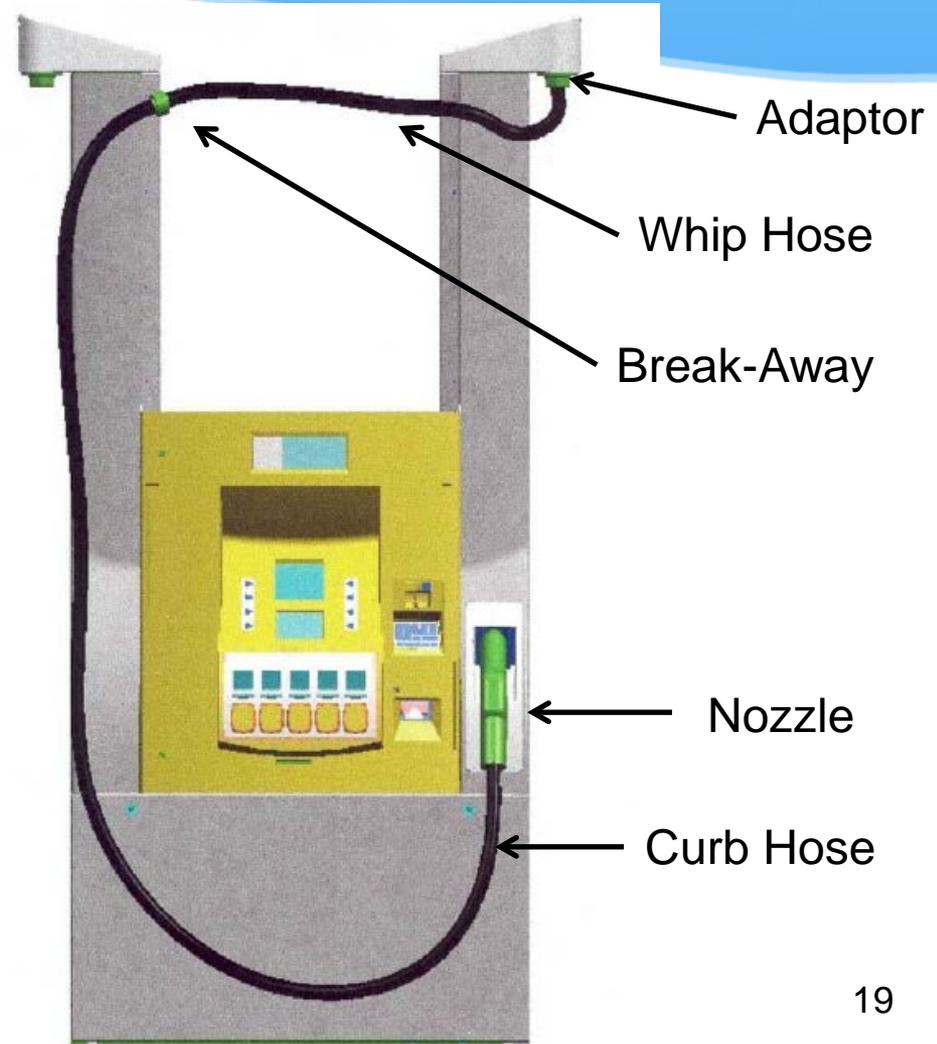
- Incorporates relevant Phase II EVR standards and specifications for liquid
- Insertion interlock is required to meet spitting standard
- New nozzle will cost more than current conventional nozzle but less than EVR nozzle

# Current ORVR Fleet Fueling Data

- 322 Facilities Statewide
  - 145 using EVR nozzles and hardware
  - 177 using uncertified conventional nozzles and hardware
- Average of 3 nozzles per facility
  - 435 EVR, 531 Conventional, 966 Total
- Average facility throughput of 19,500 gallons per month

# Upgrading to ECO Nozzles

- “Effective Date” would be the day the first ECO Nozzle is certified by ARB
- State Law allows existing equipment to remain in use for four years from the effective date.



# ECO Nozzle Costs

## Cost of Conversion: Phase II EVR to ECO Nozzle

Component	Phase II EVR Cost	ECO Nozzle Cost	Difference
Adaptor	N/A	\$ 21	\$ 21
Whip Hose	\$ 71	\$ 30	\$ -41
Breakaway	\$ 117	\$ 65	\$ -52
Curb Hose	\$ 172	\$ 84	\$ -88
Swivel	N/A	\$ 29	\$ 29
Nozzle	\$ 439	\$ 305	\$ -134
<b>Total</b>	<b>\$ 799</b>	<b>\$ 534</b>	<b>\$ -265</b>

## Cost of Conversion: Uncertified Conventional to ECO Nozzle

Component	Uncertified Conventional Cost	ECO Nozzle Cost	Difference
Nozzle	\$ 62	\$ 305	\$ 243
<b>Total</b>	<b>\$ 62</b>	<b>\$ 305</b>	<b>\$ 243</b>

# Emission Reductions from ECO Nozzle Proposal

- Spillage reduced from 0.61 to 0.24 pounds/1000 gallons dispensed
  - Applies only to the conventional nozzles that will be upgraded to ECO Nozzles
- Spillage reduced by ~15,400 pounds per year
  - Approximately 2,500 gallons (or \$9,500) of fuel

# Total Statewide Cost of ECO Nozzle Proposal

- Cost of Upgrading Conventional to ECO Nozzles = \$32,000 / year
- Savings from Replacing EVR with ECO Nozzles = \$29,000 / year
- Value of Fuel Saved from Reduced Spillage = \$9,500 / year
- Total: \$32,000 - \$29,000 - \$9,500 =  
**Statewide Savings of ~\$6,500 / year**

# Cost Effectiveness of ECO Nozzle Proposal

- Considering only the facilities upgrading from conventional to ECO Nozzles:

**\$1.48 per pound reduction**

- Statewide total, taking into account the savings from facilities replacing EVR equipment with ECO Nozzle equipment:

**\$-0.39 per pound reduction**



# REVISE AST CERTIFICATION TEST PROCEDURES

TP-201.1: PHASE I VOLUMETRIC EFFICIENCY

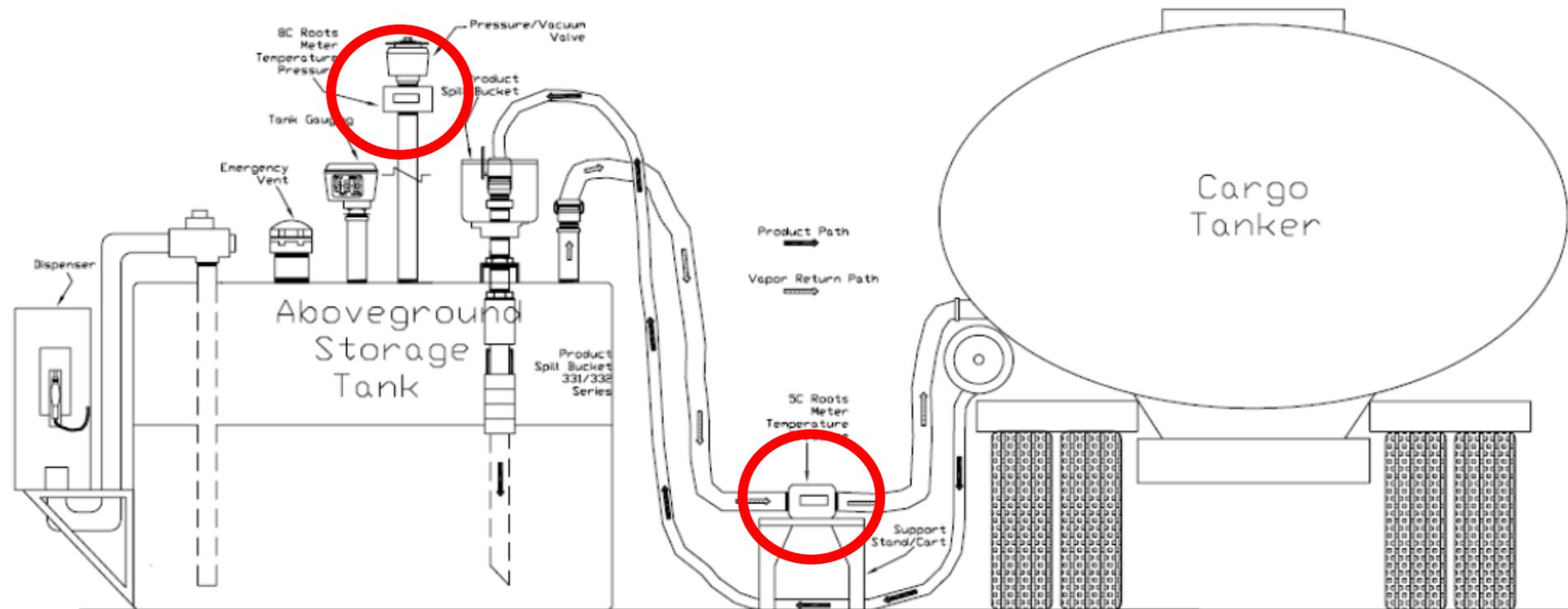
TP-206.2: STANDING LOSS CONTROL (SLC)  
EMISSION FACTOR

# TP-201.1 Amendments

- Phase I EVR systems must achieve a volumetric (fuel transfer) efficiency of  $\geq 98\%$
- Existing Phase I Volumetric Efficiency Test Procedure [TP-201.1](#) was originally developed for UST applications in 1996
- When ARB adopted EVR for AST in 2008, TP-201.1 was incorporated for AST certification
- [TP-201.1](#) not well suited for AST's due to pressure driven vent line emissions which may occur during idle periods

# TP-201.1 Amendments Background

$$\text{Phase I Efficiency Equation: } E = (100) [(V_{\text{returned}} - V_{\text{vent}}) / (V_{\text{returned}})]$$



# TP-201.1 Amendments

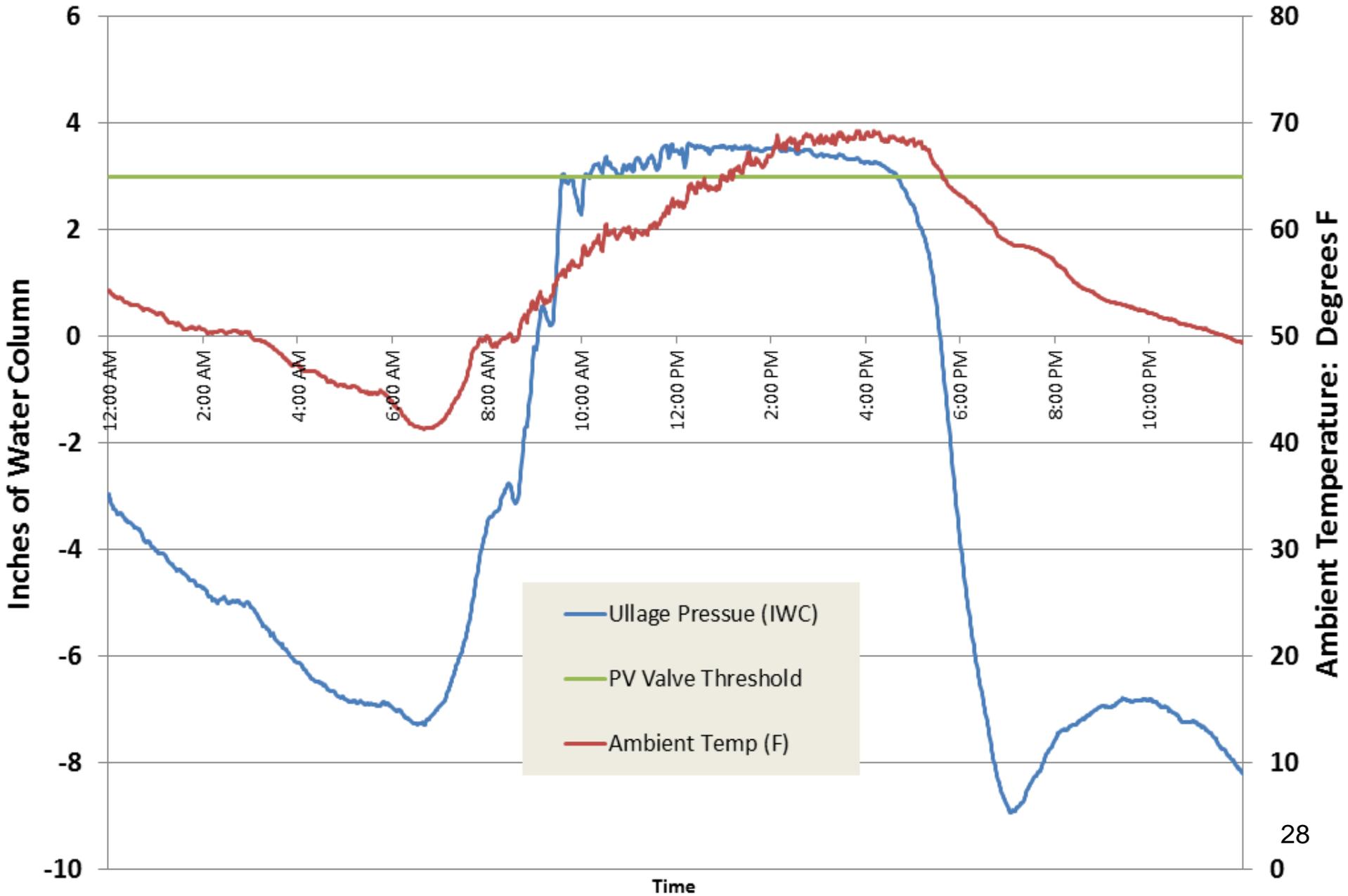
## Description of Problem



- Pressure driven vent line emissions commonly occur in single wall AST due to ambient temp increase & fuel evaporation
  - ARB data shows an average vent line flow rate of ~1 cfh
- Vent line flow rate not due to design of Phase I system, yet included in efficiency equation

# Pressure & Temperature Profile

## Single Wall AST Test Site - March 10, 2012



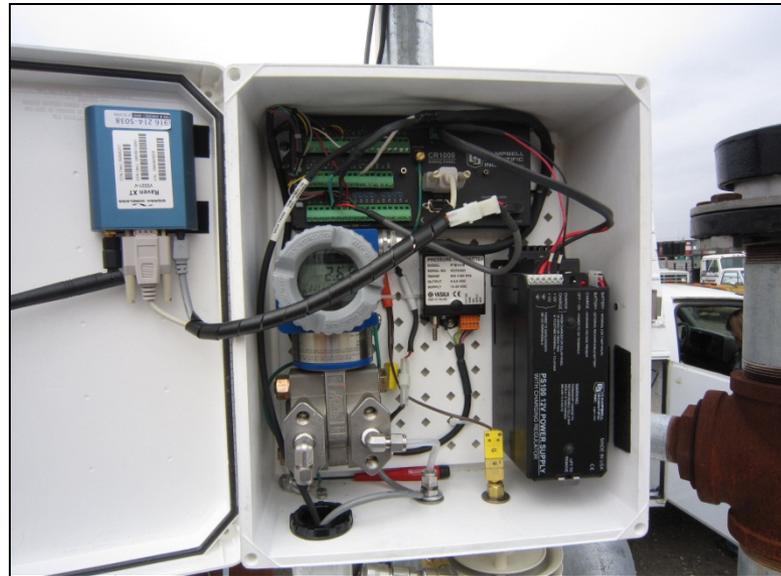
# TP-201.1 Amendments

## Method Development Test Site



### Parameters Measured:

- Vent Line Flow Rate (cubic feet)
- Ullage Pressure (Inches WC)
- Ambient Temperature (°F)
- Atmospheric Pressure (Inches Hg)
- Via Cell Phone Modem



# TP-201.1 Proposed Changes

- For ASTs, remove the post fuel delivery waiting period on vent line emissions
- For ASTs, only measure vent volume emissions during the delivery
- Figures and language updated for ASTs

# TP-206.2 Amendments

## Background

- TP-206.2 is used by ARB staff during certification testing to measure the emission factor of AST Standing Loss Control (SLC) systems that use a vapor processor
  - Measures mass emitted during periods of no deliveries or dispensing (diurnal emissions)
  - Result is reported as mass emitted per 1000 gallons of tank ullage space
  - Based on TP-201.2, emission factor test for Phase II EVR systems on underground tanks

# TP-206.2 Amendments

- TP-201.2 was amended in 2012 to:
  - Accommodate modern sampling equipment
  - Allow staff some flexibility when configuring test equipment in the field
  - Provide instructions for sampling of processor inlet and outlet streams when appropriate
  - Update instrument calibration requirements
- Today's proposal would make similar changes to TP-206.2

# TP-206.2 Amendments

- Proposed changes will not alter the performance standard for SLC
- No significant changes in cost or time required for completing testing per TP-206.2
- No SLC system with vapor processor has been submitted to ARB for evaluation
- TP-206.2 is used by ARB staff, so changes should not impact the public



# **AMENDMENTS TO GASOLINE CARGO TANK VAPOR RECOVERY PROGRAM**

# Cargo Tank Vapor Recovery Program Amendments

- **CP-204** - *Certification Procedure for Vapor Recovery Systems of Cargo Tanks*
  - **TP-204.1** - *Determination of Five Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks*
  - **TP-204.2** - *Determination of One Minute Static Pressure Performance of Vapor Recovery Systems of Cargo Tanks*
  - **TP-204.3** - *Determination of Leak(s)*

# What's Changing?

1. Administrative changes
2. Streamlining the program regarding new components and/or systems
3. Harmonizing the California and Federal requirements for leak decay testing

# New Components

1. Must meet the specifications of G-70-10-A, Exhibit II
2. Must meet annual leak rate criteria per CP-204

# California and Federal Requirements

- Different test methods required
  - California = TP-204.1
  - Federal = EPA Method 27
- Different Test Timelines

# Acceptable Test Methods

Currently Required	Proposed
TP-204.1	TP-204.1, or EPA Method 27 with exceptions

## EPA Method 27 with 3 exceptions

1. Must meet all “degassing” or vapor purging restrictions of CP-204
2. Must meet Leak Rate Criteria in CP-204
3. Pressure, Vacuum, and Internal Vapor Valve Tests passed consecutively

# Test Timelines

## California vs. Federal Test Windows

Program	Current	Proposed
California	60 days prior to expiration	30 days prior to expiration
Federal	30 days prior to expiration	30 days prior to expiration

# TP-204.3

## Vapor or Liquid leaks

Sniffer test and liquid leak standards during loading operations

- Maintains EPA Method 21 as equivalent with the exception of a probe distance of 2.5cm (approximately 1 inch)

# Benefits of Amendments

- Eliminates the certification process for new components
- Harmonizes ARB and Federal Dept. of Transportation (DOT) testing requirements



# QUESTIONS AND COMMENTS

# Contact Information

	Staff	Contact Info
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<http://www.arb.ca.gov/vapor/rulemaking.htm>