Enhanced Vapor Recovery (EVR) 2014 Rulemaking Workshop

Sacramento – July 21, 2014
Diamond Bar – July 22, 2014
Fresno – July 23, 2014

California Environmental Protection Agency
Air Resources Board

Housekeeping

* Emergency Exits, Building Evacuation, Restrooms
* Listen Only Conference Line:
  * Phone: (800) 369-1605
  * Pass Code: 36954
* For those participating via conference call, e-mail your comments during the presentation to sbacon@arb.ca.gov
* Presentation is available at http://www.arb.ca.gov/vapor/vapor.htm

Purpose of This Workshop

- Status of overpressure assessment
- Discuss proposed regulatory amendments
  - AST EVR Applicability
  - ECO Nozzles for Fueling ORVR Vehicles.
- Get feedback to improve the proposed amendments before presenting them to the Board in November 2014

Presentation Outline

Section 1: ISD Overpressure Alarms

Section 2: AST Regulatory Amendments

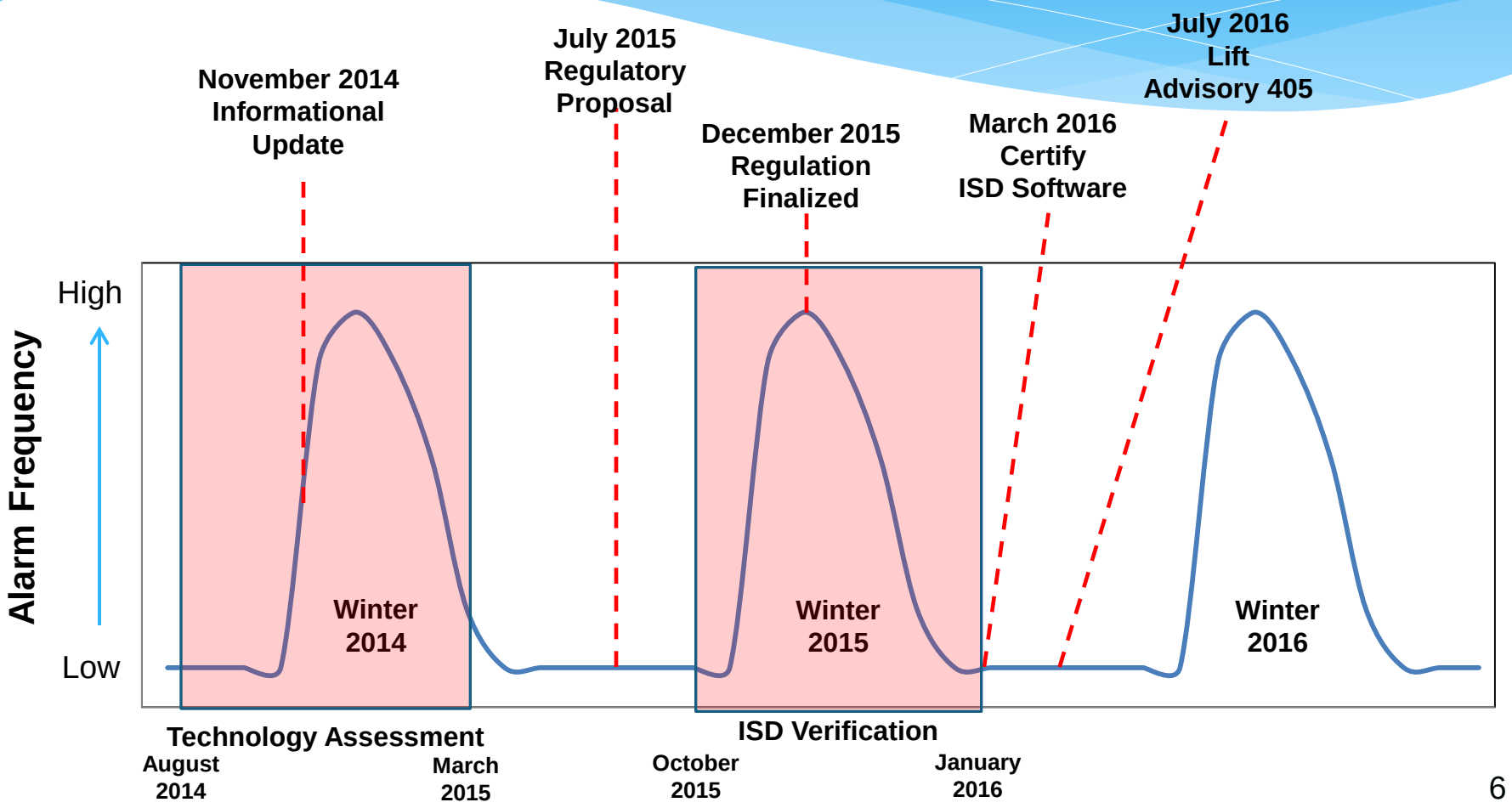
Section 3: ECO Nozzle Regulations

Section 4: Next Steps and Discussion

ISD Overpressure

* Many GDFs experience ISD overpressure alarms in winter months
  * alarms are often not associated with equipment failures
* Advisory 405-B provides temporary relief from overpressure alarm response
* ARB staff is developing a permanent regulatory solution
  * Target date for regulations was November 2014
  * Regulations now expected in July 2015

Timeline for Overpressure Solution



Overpressure Working Group

* ARB / CAPCOA Collaboration
* Analyze data and identify trends
  * Data from 400 sites throughout California, collected from fall 2013 to spring 2014
  * More detailed historic data from several ARB study sites
* Identify need for additional analysis or testing
* Provide feedback on possible solutions

ISD Overpressure
Technology Assessment

* Field testing to assess potential solutions
  * Oct 2014 to Feb 2015
  * Testing could include nozzles, hanging hardware, vapor processors, and ISD software
* Goal is to present the Board with a solution in July 2015 that is proven to be effective

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AST EVR Rulemaking
Background

* Established new vapor recovery standards for ASTs in 2008
* Rule includes three modules
  * Standing Loss Control (SLC): Controls evaporative emissions during periods of no deliveries or dispensing
  * Phase I EVR: Controls transfer emissions from delivery truck into the AST
  * Phase II EVR: Controls transfer emissions while dispensing from the AST into vehicles

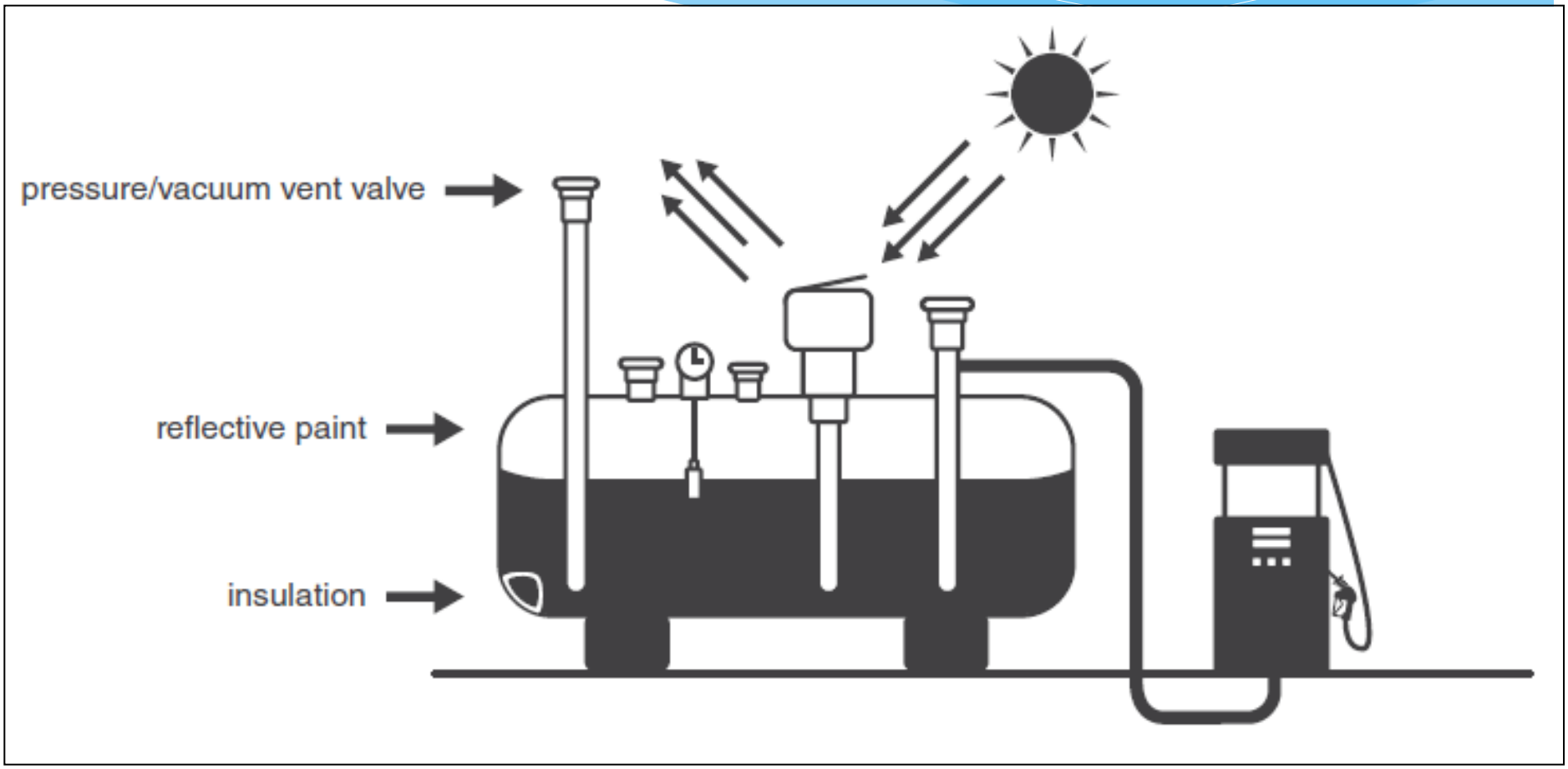
AST Implementation Timeline

EVR Module	New Installations	Existing Installations
Standing Loss Control	4/1/09	4/1/13
Phase I	7/1/10	7/1/14
Phase II	Expected in 2014*	Expected in 2018**
In-Station Diagnostics (>600,000 gal./yr.)	Pending*	Pending**

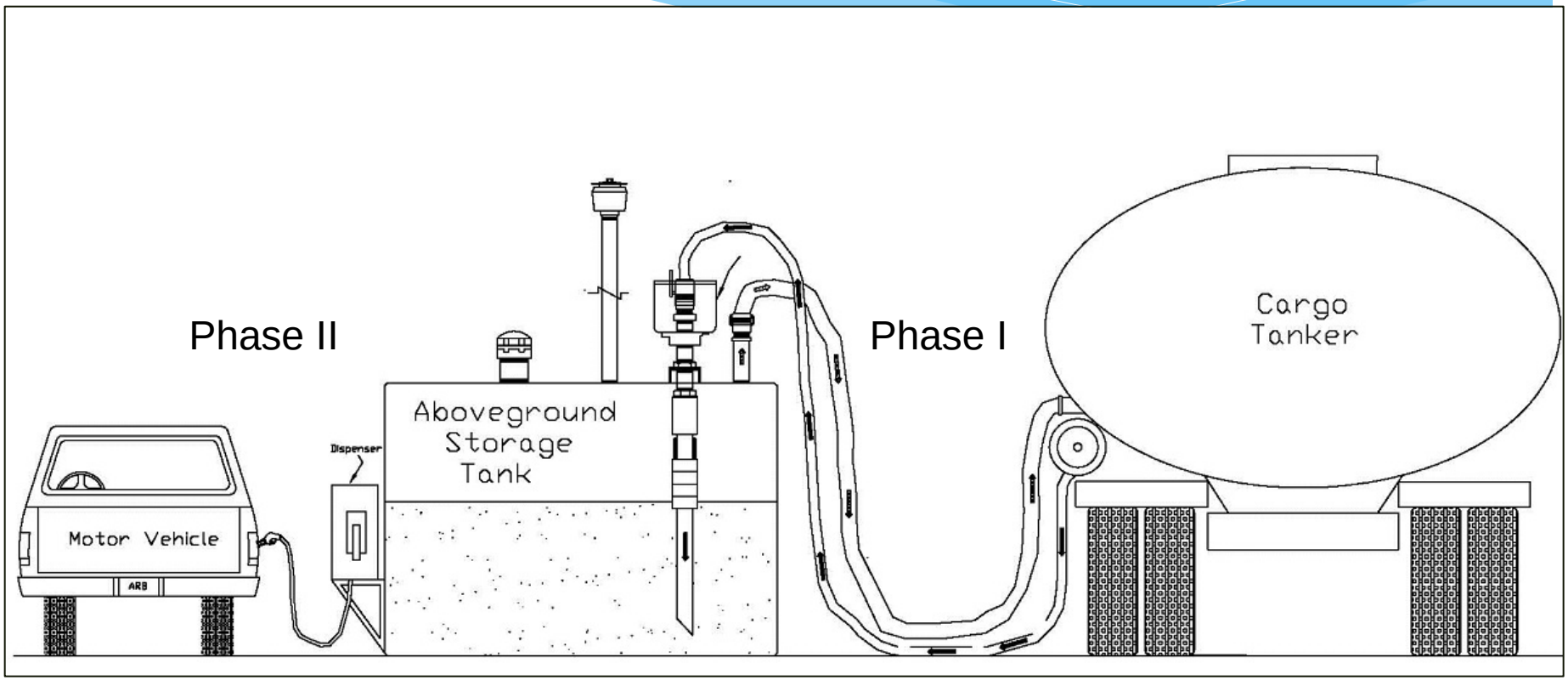
* The compliance date will be the date the first Phase II or ISD system is certified.

** The compliance date will be four years from the date the first Phase II or ISD system is certified.

Standing Loss Control



AST EVR Phase I and Phase II



2013 ARB Staff Review of AST EVR Regulations

* 2008 rulemaking cost effectiveness (CE) estimate was based on SLC, Phase I EVR, and Phase II EVR combined
* Analysis of individual modules reveals:
  * SLC is cost-effective
  * Phase I and Phase II reductions and cost-effectiveness depend on AST throughput
* Phase I EVR upgrade costs are higher than anticipated in 2008

ARB / CAPCOA Working Group

* Formed in 2013 with a goal of amending the AST EVR regulations to:
  * Maintain needed emissions reductions and public health protection
  * Improve cost effectiveness
  * Provide flexibility to districts
  * Be practical to implement
  * Harmonize with district rules where possible

AST Regulatory Advisory

* Issued on February 28, 2014
* Provides interim guidance for AST owners while regulatory amendments are developed
  * Necessary due to July 1, 2014 Phase I EVR upgrade deadline
* Avoid unnecessary upgrade expenses
* Permanent solution is to adopt regulatory amendments through a rulemaking process

Proposed Regulatory Amendments

1. Closely Match the AST Regulatory Advisory
   - Retains requirements for new facilities
   - Preserves Standing Loss Control (SLC) reductions where needed
   - Exempts existing ASTs in federal ozone attainment areas
   - Exempts low throughput ASTs from Phase I EVR requirements
   - Allows district exemptions for agricultural operations
2. Some Differences from AST Regulatory Advisory
   - Districts assess risk for ASTs near sensitive receptors
   - Allows for continued application of existing district exemptions
   - Allows districts to exempt additional facilities from EVR if certain criteria are satisfied

Tank Classifications

Class	Standing Loss	Phase I
1	Must be installed by April 1, 2013	• EVR system must be installed by July 1, 2014
2	Must be installed by April 1, 2013	• Maintain pre-EVR system • Use compatible EVR replacement components
3	Not required	• Not required • If Phase I system is present, use compatible EVR replacement components

* CP-206, sec. 1.4.3 - 1.4.5, defines classes
* Classes match steps 5 - 9 of the AST Advisory

Class 1 and Class 2 Tanks

* Class 1 and 2 includes all tanks over 250 gallons located in federal ozone non-attainment areas
* Classes are based on throughput, federal non-attainment classification, and population density
* Emission reductions from Phase I EVR are:
  * more critical in areas with more extreme non-attainment and greater population density
  * proportional to throughput of the AST
  * are less cost-effective on low throughput ASTs

Phase I EVR Upgrade Requirements for Existing Tanks (>250 gal.) Located in Non-Attainment Areas

Nonattainment Classification[1]	Annual Throughput (gallons)			Example Region
	> 60,000	18,000 to 60,000	< 18,000	
Extreme (Urban[2])	Subject	Subject	Subject	South Coast
Extreme (Rural[3])	Subject	Subject	Exempt	San Joaquin
Severe/Serious/ Moderate/Marginal (Urban[2])	Subject	Subject	Exempt	Sac Metro, Ventura, Bay Area
Severe/Serious Moderate/Marginal(Rural[3])	Subject	Exempt	Exempt	Mojave Desert, Yolo-Solano, Butte, Calaveras

[1] Classification based on 2008 federal 8-hour ozone standard (0.075 ppm).
[2] Urban defined as nonattainment area with population density of 300 persons per square mile or greater.
[3] Rural defined as nonattainment area with population density of less than 300 persons per square mile .

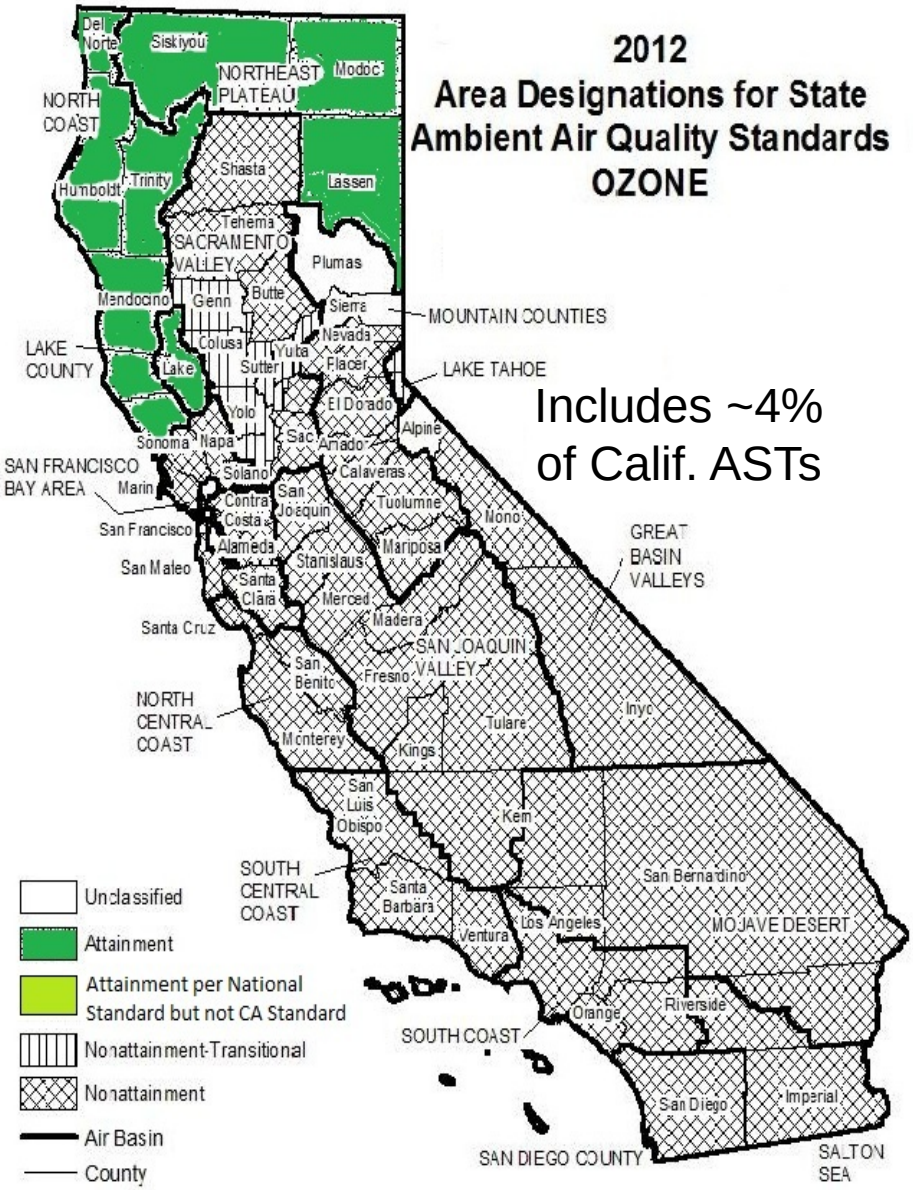
Class 1 Tanks

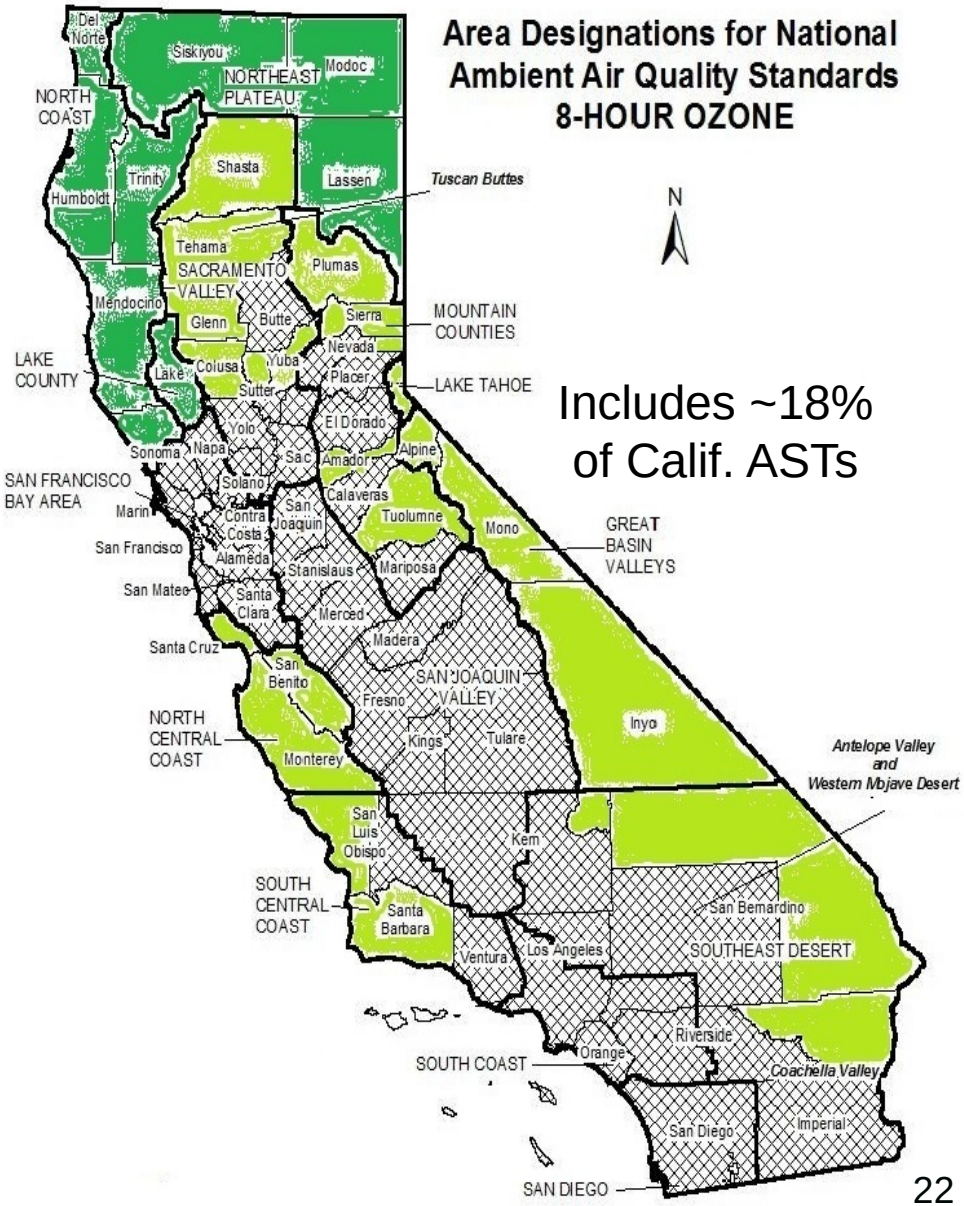
Class 2 Tanks

Class 3 Tanks

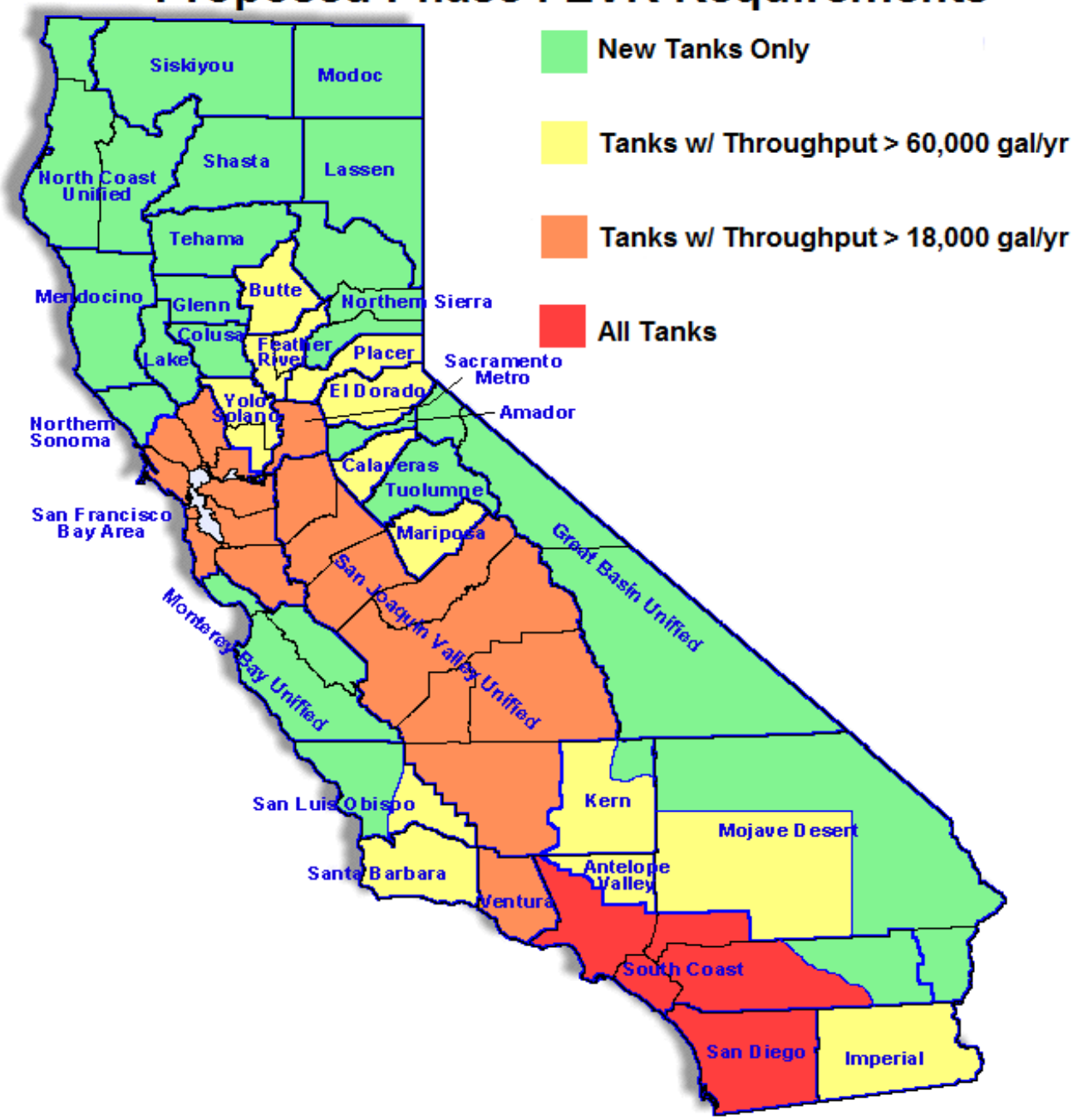
* Class 3 tanks include:
  * All tanks under 250 gallons, and
  * All tanks located in **federal** ozone attainment areas
* Current regulations exempt only those existing tanks located in **state** ozone attainment areas
  * Using federal rather than state attainment matches the AST Advisory and is consistent with other ARB rules
* Exemption applies to SLC, Phase I, and Phase II
* New facilities are still subject to all EVR requirements

State and Federal Ozone Attainment





Proposed Phase I EVR Requirements



Replacement Components

* Facilities that are exempt from Phase I EVR upgrade requirements must use EVR replacement components if compatible
  * CP-206, section 20.1
* ARB staff is developing a list of compatible components
* All ASTs will migrate toward Phase I EVR through attrition of pre-EVR components

Agricultural Facilities

* CP-206, section 1.4.1 would allow districts to exempt ASTs used in agricultural operations
  * Many districts already have such exemptions in place
  * Exemptions can apply to new and existing tanks, SLC, Phase I, and Phase II
* Identical to the AST Advisory
  * Does <u>not</u> provide new blanket exemptions for agricultural operations
  * District rules need to be in place

Differences between Proposal and AST Advisory

* **<u>Sensitive Receptors</u>:** AST Advisory prohibited exemptions for ASTs located within 50 feet of sensitive receptors
  * Intended to ensure adequate protection of public health
* Provision not included in regulatory proposal
  * Modeling shows negligible difference in risk between low throughput ASTs with pre-EVR versus EVR Phase I
  * Districts assess risk during their permitting process

Differences between Proposal and AST Advisory

* **Existing District Exemptions**: AST Advisory did not address existing district exemptions for ASTs
* Proposal allows for continuation of district exemptions adopted prior to February 28, 2014
  * Exemptions cannot be less stringent than the Benzene Airborne Toxic Control Measure (Benzene ATCM)
  * CP-206, section 1.4.2
* Eases implementation for districts and affected AST operators

Differences between Proposal and AST Advisory

* **<u>New District Exemptions</u>:** AST Advisory did not address new district exemptions for ASTs
* Proposal allows districts to adopt rules exempting ASTs that would otherwise be subject to EVR
  * District must find that the rule does not compromise public health and is consistent with air quality planning goals
  * CP-206, section 1.4.7
* Provides flexibility for districts while protecting air quality and public health

Criteria for Exempting Additional Tanks

* District must undertake rulemaking that shows exemptions do not impact:
  * Meeting federal ozone standards
  * Transport of air pollutants
  * Protecting public from cancer risk
  * Environmental justice communities
  * Benzene ATCM

What About Phase II EVR?

* Emission reductions and cost effectiveness of Phase II EVR depend on throughput
* Phase II costs unclear, so defining appropriate applicability is not practical at this time
* Proposal leaves Phase II unchanged
  * Standards separated in CP-206 for clarity (Table 2-2)
* Phase II applicability will be addressed in a future rulemaking

Summary of Regulatory Proposal

* Will not require Phase I EVR upgrades on any tanks that were exempted by the AST Advisory
* Harmonizes with existing district exemptions and provides districts with additional flexibility
* Recognizes the greater need for reductions in highly populated areas and areas of extreme or severe non-attainment
* Retains most of the Phase I emission reductions envisioned in the 2008 EVR AST rulemaking, but greatly improves cost effectiveness

Phase I Exemption Analysis

(Based on data provided by 15 of 19 non-attainment districts)

Phase I EVR Requirement	Number of Districts	# of Tanks (includes only tanks with known throughput)	# of Tanks Subject to EVR	Annual Throughput (million gal.)	
				Total	Subject to EVR
All Tanks > 250 gallons	2	731	731 (100%)	62	62 (100%)
Only Tanks > 18,000/year	5	902	307 (34%)	42	38.4 (91.3%)
Only Tanks > 60,000/year	8	326	50 (15.3%)	17.9	14.1 (78.5%)
Total	15	1,959	1,088 (55.5%)	122	114 (93.8%)

AST Phase I Emissions

	No VR System	Pre-EVR	EVR
Emission Rate	7.6 lb/1,000 gal	0.76 lb/1,000 gal	0.15 lb/1,000 gal
Control Factor*	0%	90%	98%
Annual Statewide Emissions (based on throughput of 122 million gal/yr)	927,200 lbs. (464 tons)	92,720 lbs. (46 tons)	18,300 lbs. (9 tons)
Annual Statewide Reductions	0	834,480 lbs. (417 tons)	908,900 lbs (454 tons)

* Control factors are based on certification standards

Summary of Emissions Analysis

(Based on data provided by 15 of 19 non-attainment districts)

* Relief from existing Phase I EVR upgrade requirements for ~ 45% of AST owners
* Retain more than 90% of original statewide emissions reductions
* Provide flexibility in meeting requirements while still retaining emission benefits where most needed

Phase I EVR Costs

Item	Assumed Life	Cost
Phase I EVR Components	5 years	$ 2,532
Pre-EVR Components	5 years	$ 1,549
Phase I Installation	5 years	$ 1,527
Phase I Maintenance	1 year	$ 99
Total Cost of Phase I EVR	15 years	$13,561
Total Cost of Phase I Pre-EVR	15 years	$7,635
Difference between pre-EVR and EVR	15 years	$5926
Annualized Cost of Phase I EVR (as compared to maintaining current pre-EVR system)		$ 571/year

Includes the full cost of replacing a functional pre-EVR system with an EVR system. Assumes that both pre-EVR and EVR components would need to be replaced every 5 years on average.

Phase I EVR Cost Effectiveness

Category	Current Regulations	Proposed Regulations
Number of Tanks Affected (based on tanks with known throughput in 15 non-attainment districts who provided data)	1959 tanks	1,088 tanks
Cost per Tank per Year	$571	$571
Statewide Cost per Year (without fuel savings)	$1,118,600	$621,250
Statewide EVR AST Throughput per Year	122 million gal.	114 million gal.
Statewide Emissions Reduced per Year (lbs.)	82,000 lbs.	76,600 lbs.
Statewide Fuel Saved per Year (gal.)	13,440 gal.	12,590 gal.
Statewide Value of Fuel Saved per Year	$48,375	$45,100
Statewide Cost per Year (with fuel savings)	$1,070,200	$576,150
Cost Effectiveness ($ per pound)	$13.05 / lb.	$7.50 / lb.

Summary of Cost Analysis

(Based on data provided by 15 of 19 non-attainment districts)

* ~ 800 fewer tanks need to comply with Phase I EVR requirements
* Statewide Phase I EVR implementation costs reduced by almost 50%
* Average cost-effectiveness improved from $13/lb to less than $8/lb

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ECO Nozzle Proposal
-Purpose-

* A new emission reduction strategy for facilities fueling predominately vehicles with on-board refueling vapor recovery (ORVR) systems
* New standards would provide emission reductions and in some instances cost savings
* Other states have expressed interest in California's proposed ECO nozzle regulations

ECO Nozzle

- Certification Process -

* Operational test of 180-Days (minimum)
* Will evaluate performance standards on the following criteria:
  * Spillage
  * Post Fueling Drips
  * Liquid Retention
  * Spitting
  * Nozzle Interlock Verification

ECO Nozzle
- Proposed Performance Standards-

Performance Type	Requirement	Test Procedure
Nozzle Spillage	≤ 0.24 pounds/1,000 gallons	TP-201.2C
Post-Refueling Drips	≤ 3 Drops per Refueling	TP-201.2D
Liquid Retention	≤ 100 mL per 1,000 gallons	TP-201.2E
Nozzle Spitting	≤ 1.0 mL / nozzle / fueling	TP-201.2E
Insertion Interlock	Verification of No Liquid Flow Prior to Vehicle Fueling	Testing and Eng. Eval.

ECO Nozzle
- Nozzle Spillage -

* Uncontrolled Spillage Emission Factor for Existing Conventional Nozzles = 0.61lbs./1,000 gallon
* ECO Nozzle Spillage Criteria = 0.24lbs./1,000 gallon
* 60% Reduction
* Some studies put uncontrolled emission factor at 0.70lbs./1000 gallon
  * ~ 65% reduction
* Annual Cost Effectiveness
  * Conventional to ECO Nozzle transition = $ 1.84/lb.
  * EVR to ECO Nozzle transition = $ -0.31/lb.

ECO Nozzle

- Spillage Continued: A Perspective -

* ECO Nozzle implementation
  * California's conversion to ECO
    * 42 lbs. of HC emissions reduced per day.
      * Very limited applicability in California
  * 17 States have expressed interest in ECO
    * 23 tons of HC emissions reduced per day.
      * Based upon 2010 Federal Energy Commission Report showing the 17 states use 1080.6 million barrels (45.4 billion gallons) of gasoline.
      * Roughly 3x the gasoline dispensed in CA per year.

ECO Nozzle

- Post Fueling Drips (PFD) -

* Proposal would adopt current criteria of CP-201
* Stakeholders are encouraged to provide comments on whether spillage criteria can be reduced below 0.24 lbs./1,000 gallons in exchange for elimination of PFD test procedure.
  * Comments should provide information on whether such a change would result in an increase in cost to nozzle production.

ECO Nozzle
- Liquid Retention -

* Test Procedure TP-201.2E
  * Intent is to quantify liquid retained in spout
  * Quantifies gasoline exiting spout
  * Deficient in quantifying remaining liquid retained in spout
* Proposal for Draft CP-207
  * Include engineering evaluation to quantify gasoline retained in spout in addition to existing TP-201.2E results

Additional Changes to Certification Procedures

* Several minor changes are proposed to clarify EVR manufacturers' existing requirements to:
  * Provide details about each component that is submitted to ARB for certification
  * Produce components that match those certified
  * Respond to in-use performance issues and warranty claims
* These changes will be incorporated into CP-201, CP-206, and the new CP-207

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Next Steps

* Analyze feedback from these workshops
* Revise proposal as needed based on feedback from these workshops
* Publish proposal for formal 45-day public comment period (Oct. 2014)
  * Includes full statement of reasons and detailed analysis of cost and emissions impacts
* Present the proposed regulations to Board for consideration (Nov. 2014)

Your Comments and Suggestions are Welcome

* Please submit comments by July 31, 2014
* Submit questions and comments to:

AST and General Rulemaking	ECO Nozzle
Scott Bacon sbacon@arb.ca.gov (916) 322-8949	Paul Marzilli pmarzill@arb.ca.gov (916) 445-7431