Aboveground Storage Tank (AST) Enhanced Vapor Recovery (EVR) Advisory Workshop

Sacramento – April 28, 2014
Diamond Bar – April 30, 2014
Fresno – May 1, 2014

California Environmental Protection Agency

Air Resources Board

Housekeeping

- Emergency Exits, Building Evacuation, Restrooms
- Listen Only Conference Line:
  - Phone: 800-857-0395
  - 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

- Explain the AST EVR Advisory
  - Why was it issued
  - What it does. What it does not do.
- Get feedback to guide AST EVR amendments that would be considered in November by ARB

Presentation Outline

Section 1: AST EVR Background

Section 2: AST Regulatory Advisory

Section 3: Estimated Costs and Emissions Impact

Section 4: Next Steps and Discussion

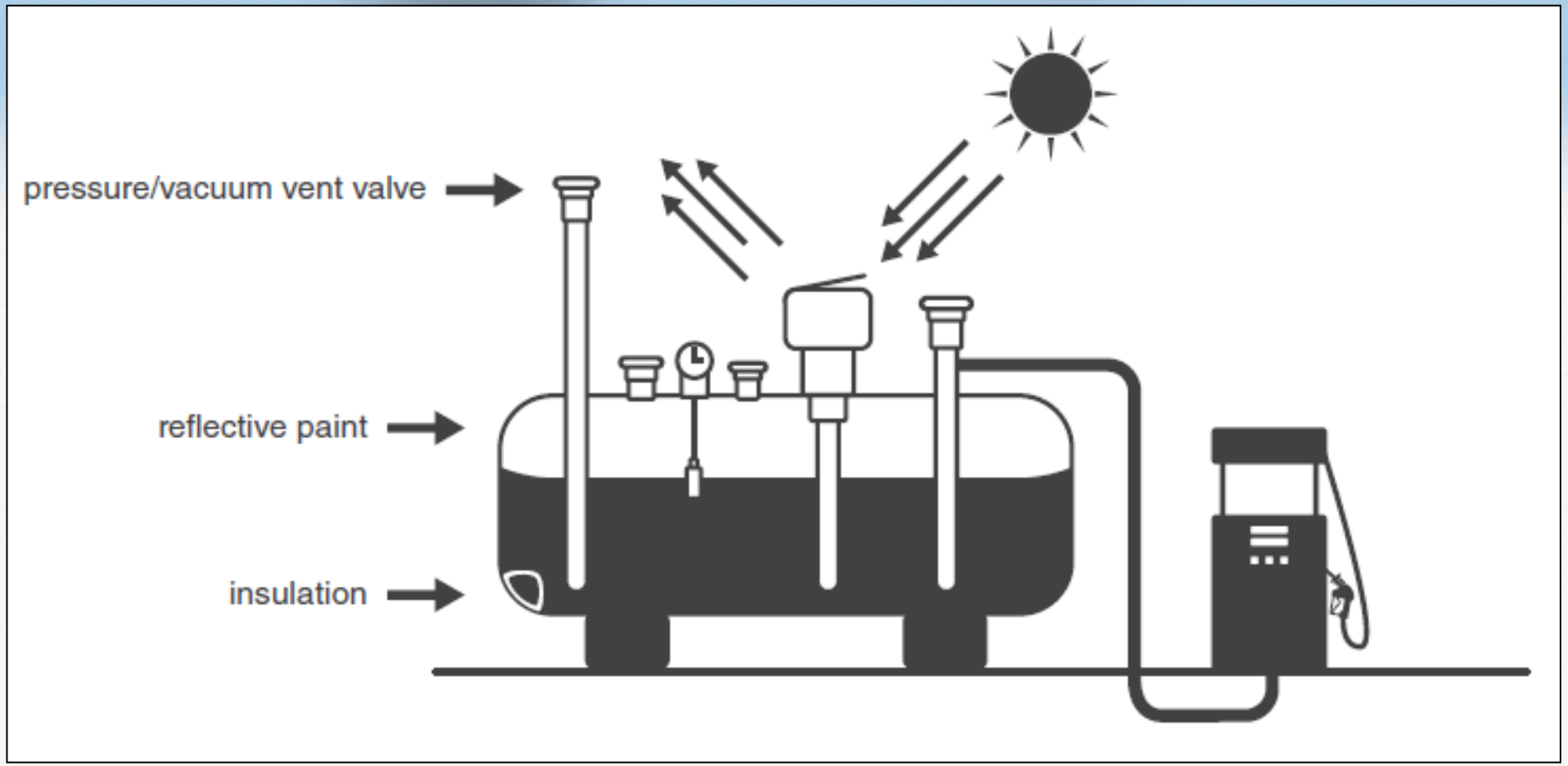
Section 1

AST EVR Background

AST Rulemaking

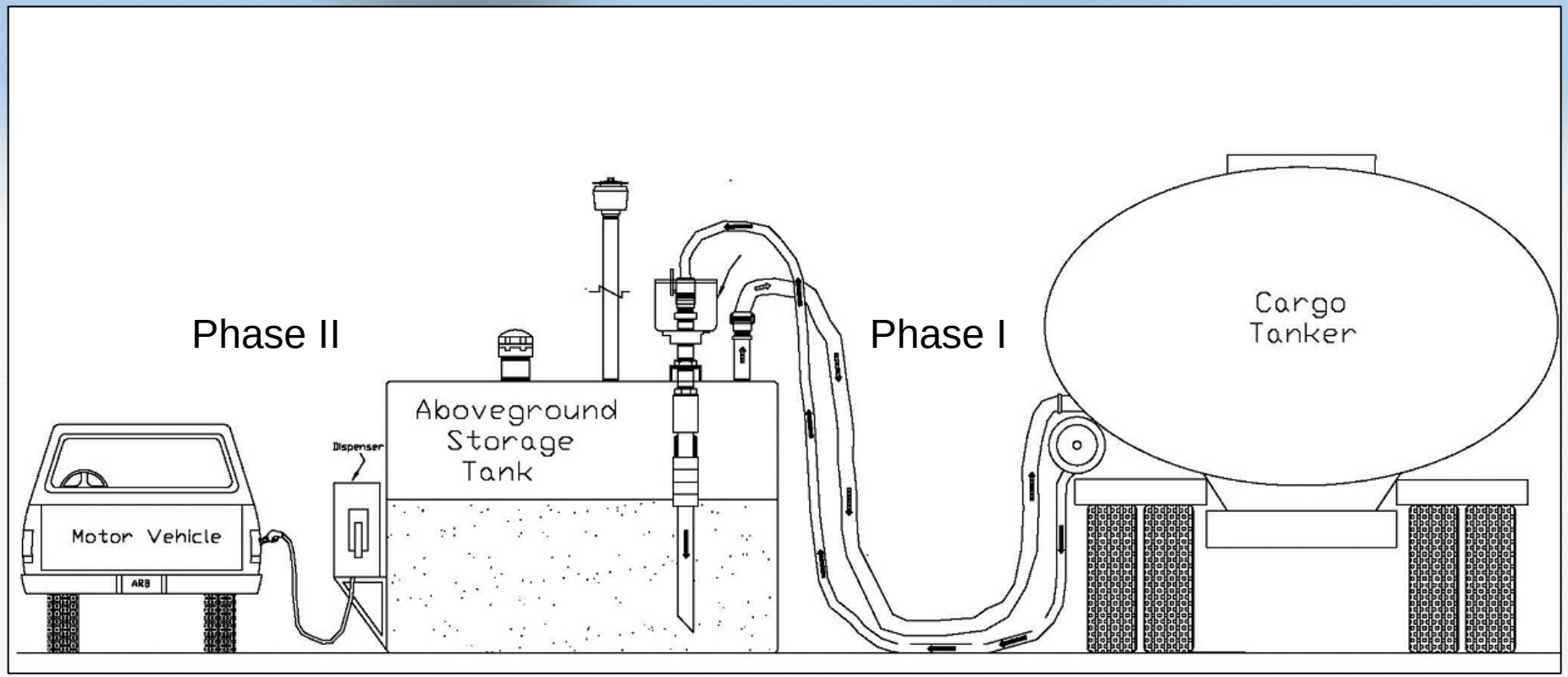
- ARB adopted a rule in 2008 that establishes new vapor recovery standards for ASTs
- Rule includes three modules:
  - Standing Loss Control
    - Controls evaporative emissions (periods of no deliveries or dispensing)
  - Phase I EVR
    - Controls transfer emissions from delivery truck into the AST
  - Phase II EVR
    - Controls transfer emissions while dispensing from the AST into vehicles

Standing Loss Control

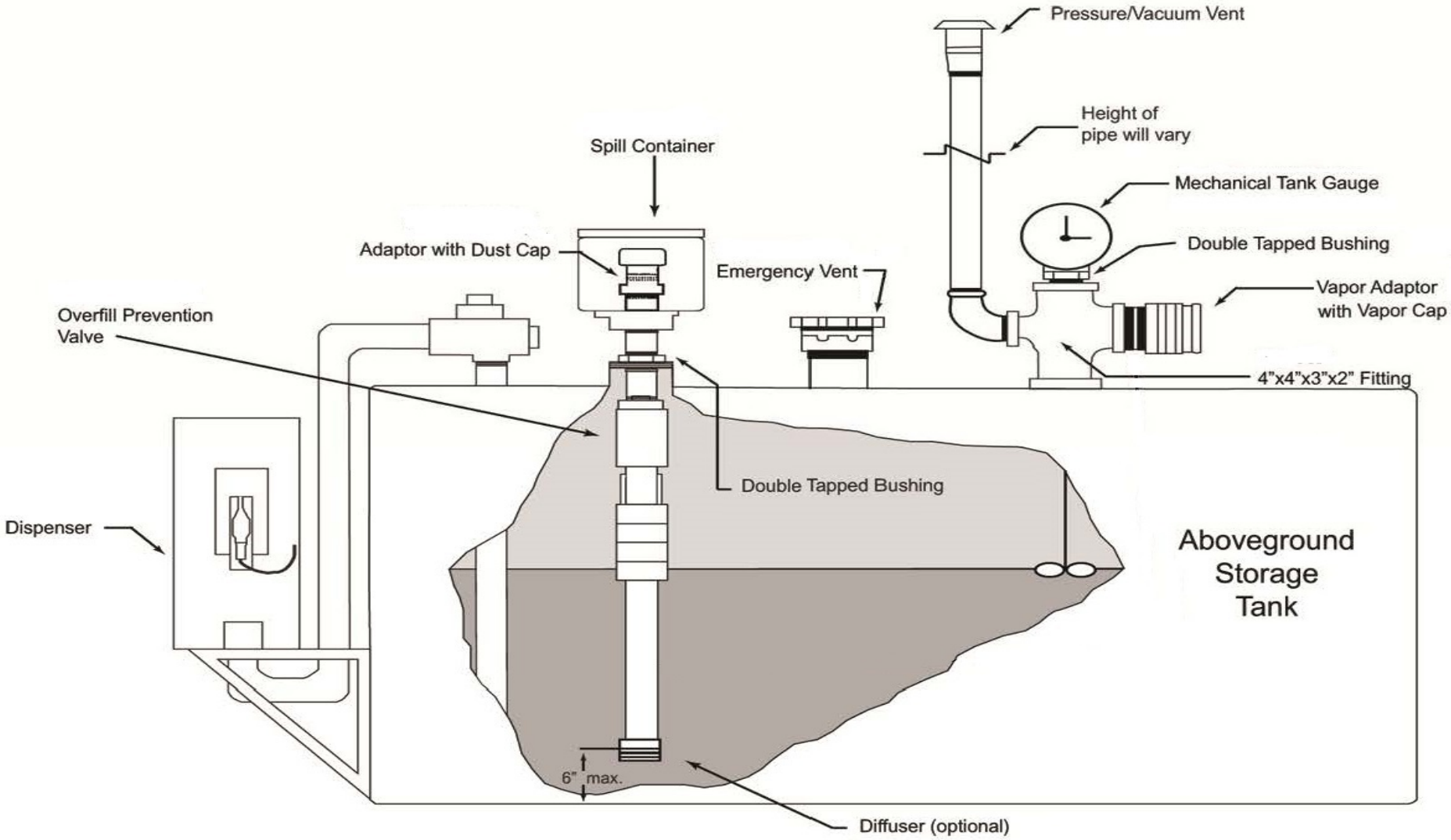


Standing Loss Control: Protected and Unprotected ASTs

AST EVR Phase I and Phase II



Phase I EVR Components



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.

Section 2

AST Advisory

ARB Staff Review of AST EVR Regulations

- 2008 rulemaking cost effectiveness (CE) estimate combined SLC, Phase I EVR, and Phase II EVR
- Analysis of individual modules reveals:
  - SLC is cost-effective
  - Phase I and Phase II reductions are directly proportional to throughput
- Phase I EVR upgrade costs are higher than anticipated in 2008

ARB / CAPCOA Working Group

- Develop amendments to AST EVR regulations that would:
  - Maintain needed emissions reductions and protect public health
  - Improve cost effectiveness
  - Provide flexibility to districts
  - Be practical for districts and industry to implement
  - Harmonize with district rules where possible

Purpose of AST Advisory

- Provide interim guidance for AST owners while regulatory amendments are developed
  - Necessary since the deadline to upgrade to Phase I EVR is approaching
- Avoid unnecessary upgrade expenses

Limitations of the AST Advisory

- Advisory is NOT a regulation
- Advisory explains that enforcement discretion will be used with regard to July 1, 2014 compliance date
- Advisory is temporary
- Permanent solution is to adopt regulatory amendments through a rulemaking process
  - Amendments may differ from the Advisory

AST Advisory
Key Provisions

1. Retain requirements for new facilities
2. Preserve Standing Loss Control (SLC) reductions where needed
3. Exempt existing ASTs in federal ozone attainment areas
4. Exempt low throughput ASTs from Phase I EVR requirements
5. Harmonize with existing district exemptions for agricultural operations
6. Require controls on ASTs near sensitive receptors

Standing Loss Control (SLC)

- Per 2008 rulemaking estimates, SLC accounts for 89% of total emissions reductions from AST EVR regulations
- Overall SLC is very cost effective
- Two areas identified where cost-effectiveness could be improved
  - Existing protected tanks
  - Federal ozone attainment areas

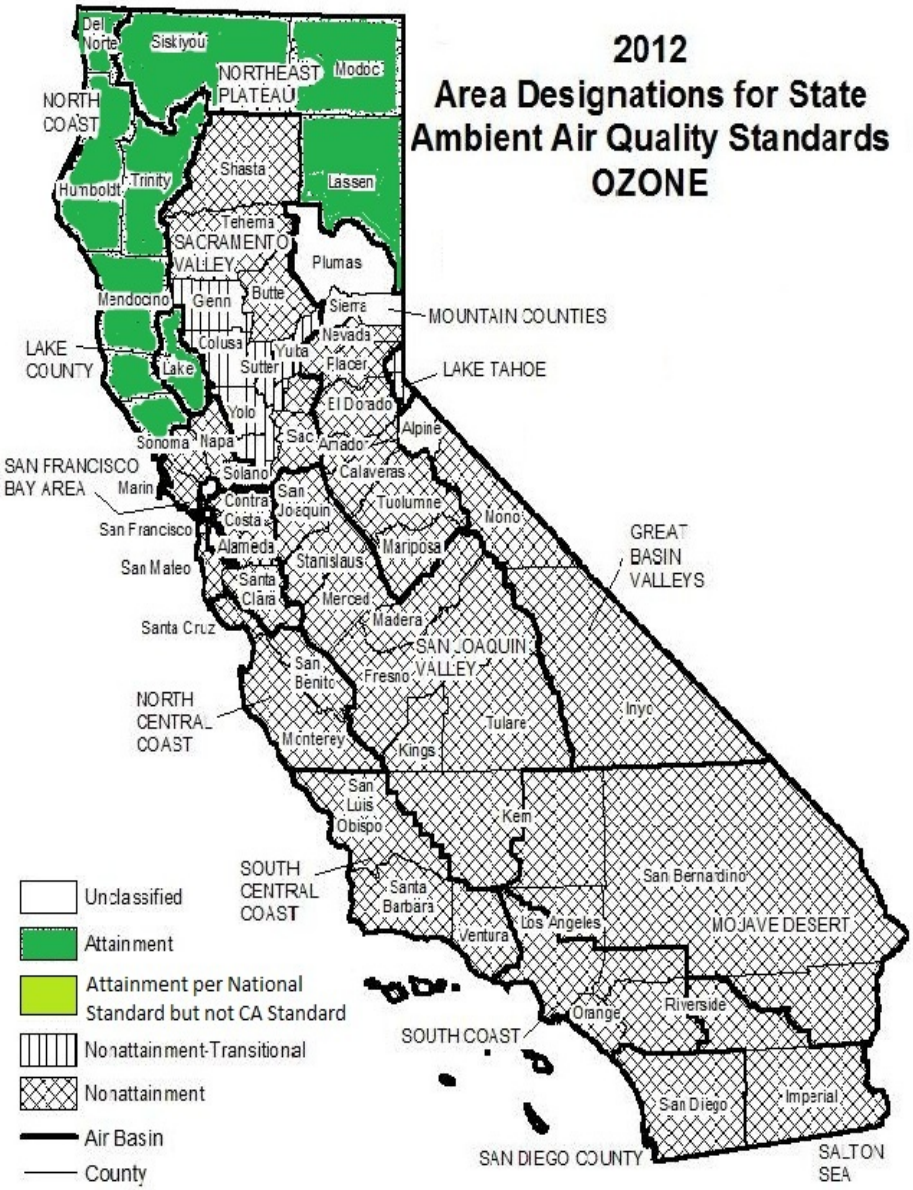
SLC for Existing Protected Tanks

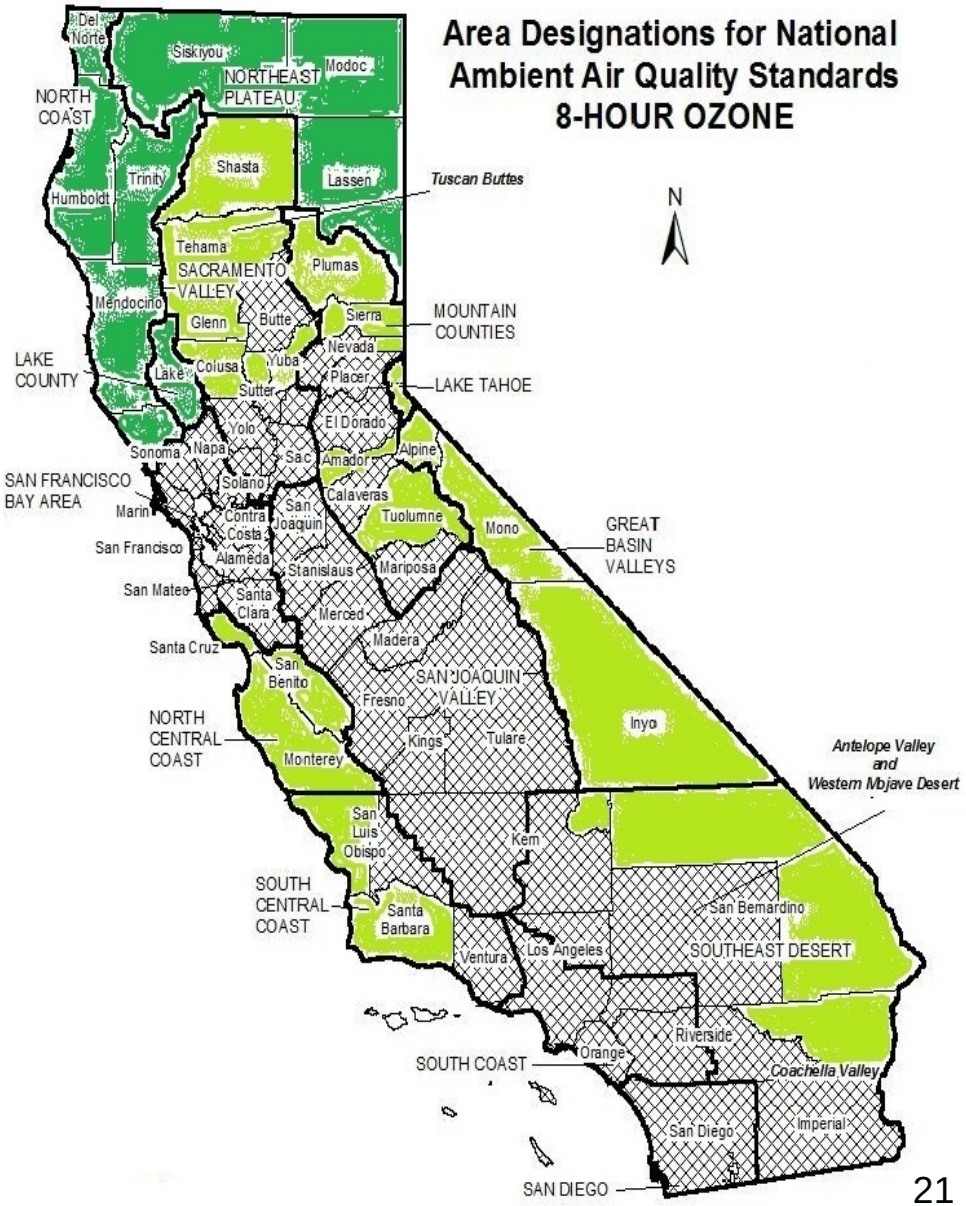
- SLC Executive Order requires painting existing protected tanks with an approved coating
- Recent ARB test data indicates that some existing protected tanks comply with the SLC performance standard for existing tanks
- SLC Executive Order is being revised to include certain existing protected tanks that meet specified design criteria, such as UL 2085
- Significantly reduces implementation cost
- Note: EVR P/V valve is still required

Exempt Existing ASTs in Federal Ozone Attainment Areas

- Switch exemption criteria from state to federal ozone attainment designation
- Consistent with exemptions in other ARB rules
- Reduces the number of subject ASTs
  - Applies to SLC, Phase I, and Phase II
- Retains controls in areas where emission reductions are most needed
- Provides relief and flexibility in many districts

State and Federal Ozone Attainment





Effects of Switching from State to Federal Ozone Designation

- Staff estimates 4% of existing AST are exempted under state ozone designation
- Additional 18% would be exempted under federal ozone designation
- New facilities are still subject to EVR
- Where SLC is cost effective, provide flexibility so attainment districts may consider requiring SLC by local rule

Phase I EVR

- Emission reductions from Phase I controls are proportional to throughput
- Phase I controls installed on low throughput ASTs provide lower emission reductions and are less cost-effective
- Phase I exemptions are based on throughput while considering federal non-attainment classification and population density

Exemption for Existing Low Throughput ASTs

Nonattainment Classification[1]	Annual Throughput (gallons)			AST with Capacity of 250 Gallons or Less	Example Region
	> 60,000	18,000 to 60,000	< 18,000		
Extreme (Urban[2])	Subject	Subject	Subject	Exempt[4]	South Coast
Extreme (Rural[3])	Subject	Subject	Exempt[4]	Exempt[4]	San Joaquin
Severe/Serious/ Moderate/Marginal (Urban[2])	Subject	Subject	Exempt[4]	Exempt[4]	Sac Metro, Ventura, Bay Area
Severe/Serious Moderate/Marginal (Rural[3])	Subject	Exempt[4]	Exempt[4]	Exempt[4]	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 .
[4] AST installation must be more than 50 feet away from the nearest sensitive receptor.

Analysis of Throughput Exemption

(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)	Total Annual Throughput	# of Tanks Subject to EVR	Throughput Subject to EVR
All Tanks > 250 gallons	2	731	62,000,000	731 (100%)	62,000,000 (100%)
Only Tanks > 18,000/year	5	902	42,000,000	307 (34%)	38,400,000 (91.3%)
Only Tanks > 60,000/year	8	326	17,900,000	50 (15.3%)	14,100,000 (78.5%)
Total	**15**	**1,959**	**122,000,000**	**1,088 (55.5%)**	**114,000,000 (93.8%)**

Low Throughput Exemption

- Greatly improves cost effectiveness
- Retains most of the Phase I emission reductions envisioned in the EVR AST rulemaking
- Recognizes the greater need for reductions in areas of extreme or severe non-attainment
- Harmonizes with existing district exemptions for tanks under 250 gallons capacity

Replacement Components

- Facilities that are exempt from EVR upgrade requirements must use EVR replacement components if compatible
  - ARB staff is developing a list of compatible components
- All ASTs will migrate toward EVR systems over time, through attrition of existing components

Agricultural Facilities

- Advisory recognizes existing district exemptions for 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
- Advisory does not provide new blanket exemptions for agricultural operations
  - District rules need to be in place

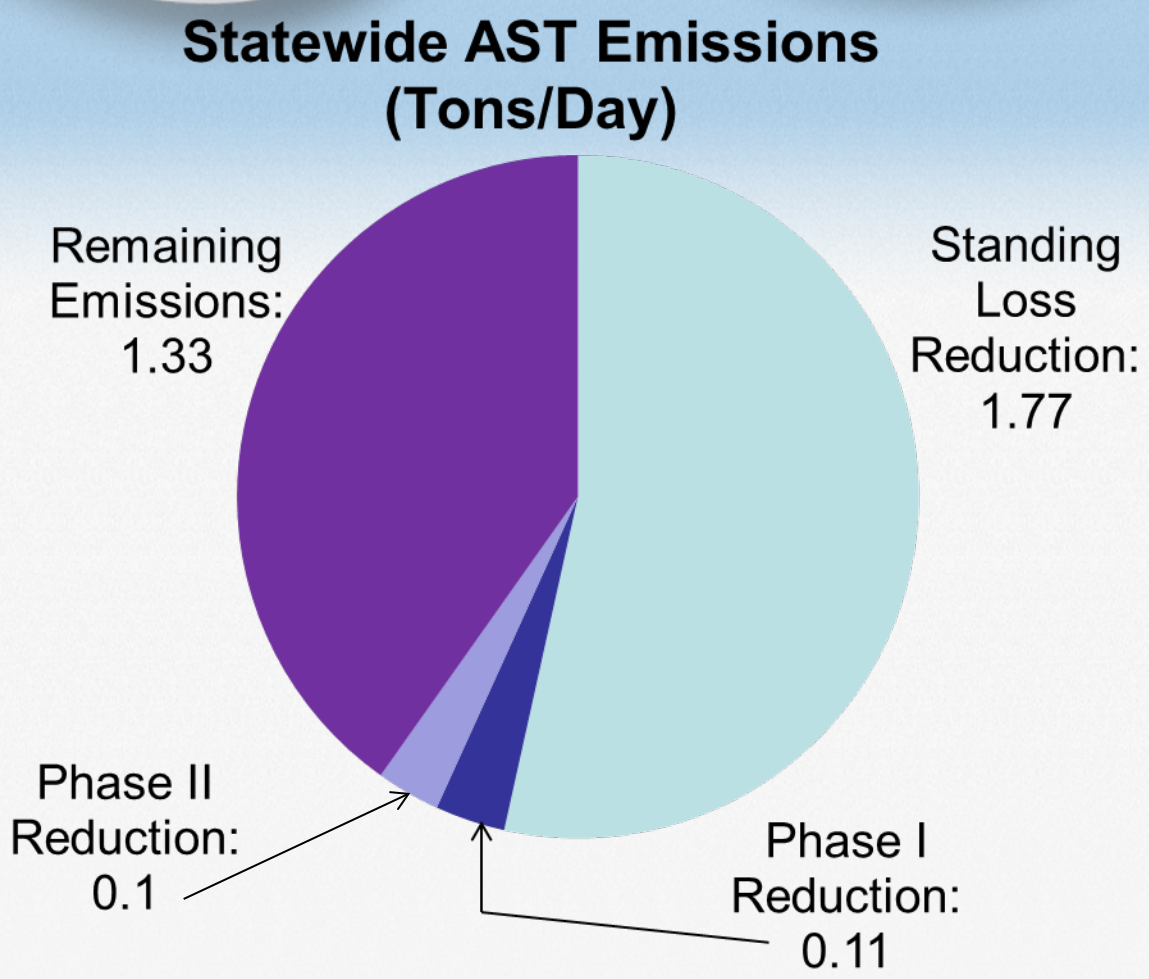
Sensitive Receptors

- No exemptions for ASTs located within 50 feet of sensitive receptors
    - residence, school, day care, or healthcare facility
- Ensures adequate protection of public health
- Similar sensitive receptor provisions exist in various ATCMs
- Final regulatory proposal will be based on recent ARB risk modeling

Section 3

Estimated Costs and Emissions Impact

2008 Rulemaking Emissions Estimates



Emission Factor for Standing Loss Control (SLC)

- Uncontrolled emissions: 5.7 lbs./1000 gal. tank ullage/day
  - Based on bare steel tank with no P/V valve
  - Varies with tank size, temp., and fuel RVP

Technology	Control %	Emission Factor
Bare steel and P/V Valve (Based on ARB test data. Not an allowable configuration)	~ 40	~ 3.4 lb./1000 gal./day
P/V and Paint	60	2.26 lb./1000 gal./day
P/V and Certified Insulated or Protected Tank	90	0.57 lb./1000 gal./day

SLC Costs

Item	Assumed Life	Cost
P/V Valve	3 years	$ 416
P/V Valve Installation	3 years	$ 245
Paint	15 years	$ 114
Decal Kit	15 years	$ 150
Paint Installation	15 years	$ 2,148
Total		$ 3,072
Annualized Cost (15 yrs)		$552 per year

- Costs to upgrade an existing 1,000 gallon unprotected steel tank
- Based on 2013 survey of equipment suppliers and installers

SLC Cost Effectiveness

example: 1000 gal. unprotected tank

- SLC upgrade requires an approved paint and an approved pressure/vacuum (P/V) vent valve
- Cost effectiveness varies depending on tank size and current equipment configuration

Current Equipment	No P/V	Pre-EVR P/V	EVR P/V
Annualized Cost	$552	$552	$511
Emission Reductions	627 lb./yr.	209 lb./yr.	209 lb./yr.
Value of Fuel Saved	$356/yr.	$119/yr.	$119/yr.
Cost Effectiveness	**$0.31/lb.**	**$2.07/lb.**	**$1.87/lb.**

Phase I Emission Factors

Emission factors are based on certification standards

	No VR System	Pre-EVR	EVR
Emission Rate	7.6 lb/1000 gal	.76 lb/1000 gal	.15 lb/1000 gal
Control Factor	0%	90%	98%
Emissions from 100,000 gal. throughput	760 lb (125 gal)	76 lb (12 gal)	15 lb (2.5 gal)

Phase I EVR Costs

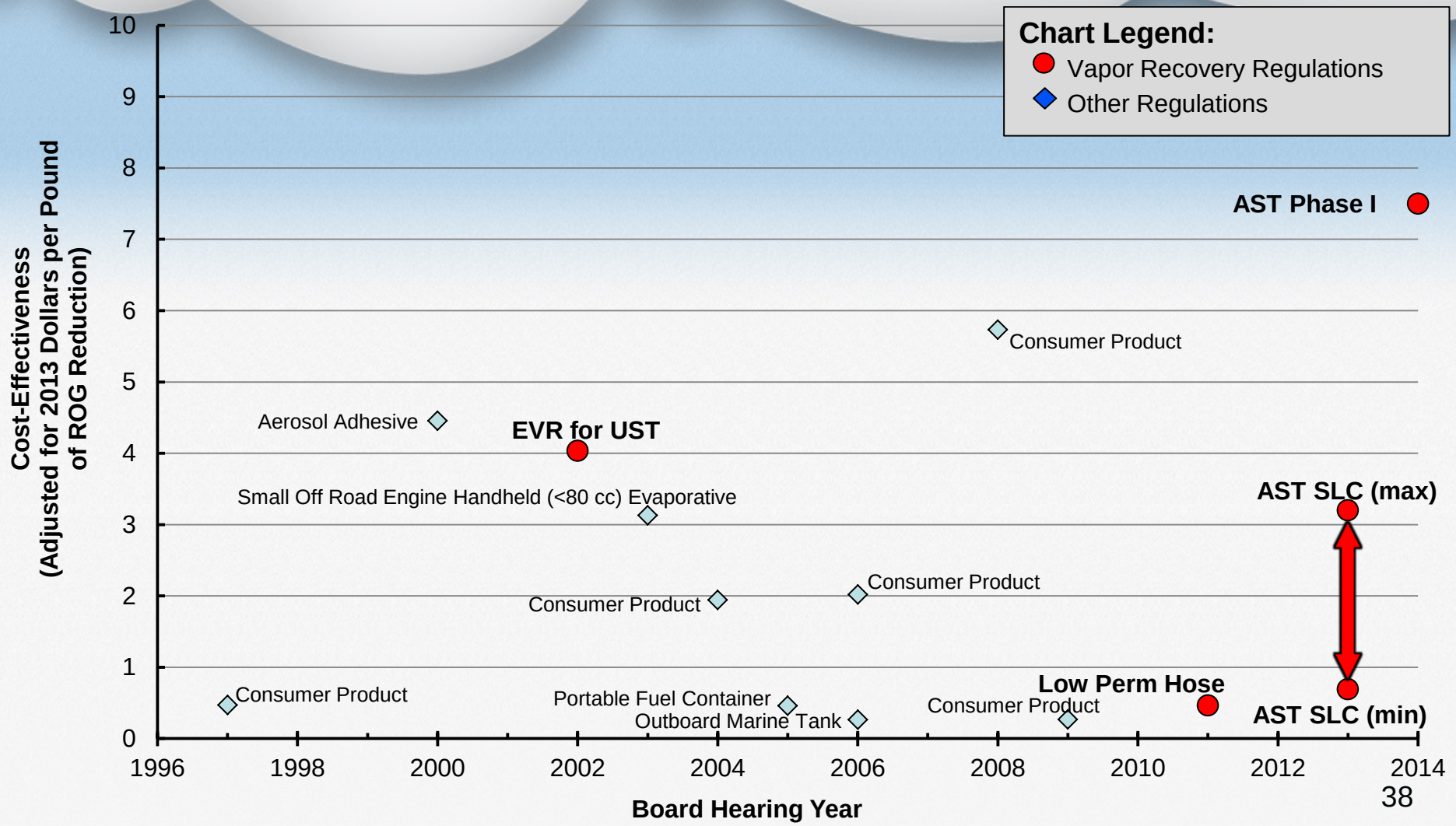
Item	Assumed Life	Cost
Phase I EVR Components	5 years	$ 2,532
Pre-EVR Components	5 years	$ 1,549
Phase I Installation	5 years	$ 1,527
Phase I Maintenance	1 year	$ 99
Total Cost of Phase I EVR	15 years	$13,561
Total Cost of Phase I Pre-EVR	15 years	$7,635
Difference between pre-EVR and EVR	15 years	$5926
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	Without Advisory	With Advisory
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	122,000,000 gal.	114,000,000 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.

Cost Effectiveness of Various VOC Control Programs



Section 5

Next Steps and Discussion

Next Steps

- Solicit feedback and analyze statewide impacts of AST Regulatory Advisory
- Prepare a formal regulatory proposal
  - Based on the Advisory and feedback from workshops
- Public workshops on regulatory proposal (late June 2014)
- Revise proposal as needed based on feedback from workshops
- Present the proposed regulations to Board for consideration (Nov. 2014)

Your Comments and Suggestions are Welcome

- Please submit comments by May 9, 2014
- Questions and comments can be submitted to:

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