



Portable Refueling Stations

ARB Monitoring and Laboratory
Division

June 24, 2009



Agenda

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- Population Survey
- Growth Projections
- Emissions Testing/Calculations
- Emissions Data
- Control Strategies
- What's Next?
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Category Description

- Portable refueling stations are plastic or metal containers, generally between 10 and 30 gallons.
- Used to store and dispense fuel to tractors, lawn mowers, boats, generators, motorcycles, or other motor vehicles or implements.
- Generally on wheels, or are capable of being carried.
- Fuel dispensing is typically through gravity feed hoses, a hose and nozzle assembly, or a 2-way rotary hand pump.

Portable Refueling Stations





Regulation Objectives

- Reduce gasoline permeation emissions.
- Reduce gasoline vented/evaporative emissions (including leaks).
- Reduce gasoline refueling losses (vapor displacement).
- Reduce gasoline spillage?



Population Survey

- Approximately 230 steel and 2280 plastic refueling stations sold in CA in 2008 (2510 units per year).
- Total population data under review.



Growth Projections

- Growth estimates in 10 years (Year 2018):
 - Steady Growth (Same rate per year): 25,100 units.
 - 20% Overall Growth: 30,120 units.
 - 5% Annual Growth: 35,659 units.



Emissions Testing/Calculations

- Tanks: Permeation, vented/evaporative, leak emissions.
 - SHED Testing (65°-105°-65° temp. profile).
 - Gravimetric procedures.

- Hoses: Permeation (pending).
 - Gravimetric procedures.

- Spillage (pending).

- Refueling losses (vapor displacement).

- Test/calculation results to date available on website <http://www.arb.ca.gov/consprod/fuel-containers/fuel-containers.htm>.



Emissions Data

■ Permeation Losses

- Based on .80 g/gal/day emission factor (for plastic tanks).
 - 2008-- .03 Tons Per Day (TPD).
 - 2018--Steady Growth: .28 TPD.
 - 2018--20% Growth: .34 TPD.
 - 2018--5% Annual Growth: .40 TPD.



Emissions Data (cont.)

- Vented/Evaporative Losses

- Based on 2.71 g/gal/day emission factor (for metal tanks).

- 2008-- .02 Tons Per Day (TPD).

- 2018--Steady Growth: .15 TPD.

- 2018--20% Growth: .18 TPD.

- 2018--5% Annual Growth: .22 TPD.



Emissions Data (cont.)

- Spillage (pending).



Emissions Data (cont.)

■ Refueling Losses

- Based on 12 refueling events per/year, volume transferred (50 percent).
 - 2008--.62 tons/yr (.002 TPD).
 - 2018--Steady Growth: 6.20 tons/yr (.017 TPD).
 - 2018--20% Growth: 7.44 tons/yr (.020 TPD).
 - 2018--5% Annual Growth: 8.81 tons/yr (.024 TPD).



Emissions Data (cont.)

■ Hoses

- Draft testing protocol completed.
- In process of being tested.



Emissions Data (cont.)

- Summary Data 2018 (5% steady growth):

- Tanks—

- Permeation losses: .40 TPD
 - Vented/evap. losses: .22 TPD
 - Refueling losses: .024 TPD

.644 TPD

- Hoses (pending).



Control Strategies

- Metal Tanks: reduce vent/evaporative emissions, and leaks.
 - Vent Caps.
 - Hardware Fittings.
- Plastic Tanks: reduce permeation, vent/evaporative emissions, and leaks.
 - Barrier treatment.
 - Construction material.
 - Hardware fittings.



Control Strategies (cont.)

- Hoses: reduce permeation emissions.
 - Low Permeation Hoses
- Spillage
 - Improvement to hardware connections.
 - Mechanical device.
 - Visibility and control measures.
- Refueling losses.
 - Spout configuration.
 - Closed fueling system.



What's Next?

- Complete testing of hoses.
- Complete testing of tanks and hoses with CaRFG3 gasoline with 10% ethanol.
- Develop emission standards for category.



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