



UTAH DEPARTMENT *of*  
ENVIRONMENTAL QUALITY

**AIR  
QUALITY**

## **Technical Supporting Documentation**

**Proposal to Amend R307-328; Gasoline Transfer and Storage, to establish a requirement for gasoline dispensing facilities located in Davis, Salt Lake, Tooele, Utah and Weber counties to use CP - 207 certified dripless nozzles and low permeation hoses for the dispensing of gasoline**

**2024**

## Gasoline Dispensing Inventory

The Utah Division of Air Quality (UDAQ) developed an inventory of the number of gasoline dispensing pumps currently located within the applicable counties. That inventory was then multiplied by 2 to approximate the number of gasoline nozzles and hoses located within the same region, as each pump typically houses two different filling locations.

Table 1: Number of gasoline dispensing pumps located within each county included in the proposed amendments to R307-328.

County	# Businesses	# Dispensing Pumps
Davis	75	867
Salt Lake	235	3,193
Tooele	38	234
Utah	154	1,628
Weber	79	941
<b>TOTAL</b>	<b>581</b>	<b>6,863</b>

Source: Dispensing units provided by Utah Weights and Measures Program Manager (2023).

Total number of gasoline dispensers: (2 hoses and nozzles per pump) x (6,863 pumps) = 13,726 dispensers.

### Low Permeable Hoses

Below is an overview of how the Utah Division of Air Quality quantified the emission reductions associated with the adoption of CP - 207 certified low permeability tubing.

CARB empirical equation to predict uncontrolled permeation rate<sup>1</sup>: Permeation Rate =  $16.628e^{0.0693(\text{temp in C})}$

Annual Average Salt Lake City temperature<sup>2</sup>: 53 degrees F/ 11.7 degrees C.

Permeation rate = 37.3 g/m<sup>2</sup>/day.

(37.3 g/m<sup>2</sup>/day) (0.0022 lb/g) (0.1824 m<sup>2</sup> conv hose) = 0.0149 lb/day evaporative loss/hose.

(0.0149 lb/day) (365 days/yr) = 5.4602 lb/yr/hose/ (6.24 lb/gal weight of gas) = 0.8750 gal/yr loss/hose.

(0.8750 gal/yr) (0.96 emission reduction from low perm hose) = (0.84 gal/yr saved) (6.24 lb/gal gas) = 5.24 lbs/yr/hose savings with low perm hose.

<sup>1</sup> CARB, Gasoline Dispensing Facilities Hose Emissions Inventory For Vacuum Assist and Conventional Hoses Appendix 4. <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2011/evr11/gdfhapp4.pdf>

<sup>2</sup> U.S. National Weather Service.

(13,726 fueling positions) (5.24 lbs/yr/hose) = 71,924.24 lbs/yr/2000 = 35.96 tons/yr fuel emission control.

(71,924.24 lbs/yr)/(6.24 lb/gal gas) = 11,526 gal/yr saved (\$3/gal) = \$34,579 saved / year.

*Notations*

1. 0.0022 lb/gram conversion factor from gram to pound.
2. 0.1824 m<sup>2</sup> conv hose = avg permeable surface area for conventional hose<sup>3</sup>.

Conclusion: The adoption of CP - 207 certified low permeation hoses would result in the reduction of 35.96 tons per year of VOC emissions.

### Dripless Nozzles – MOVES4 Workbook

Below is an overview of the resulting emission reductions from the adoption of CP - 207 certified nozzles as identified using the MOrtor Vehicle Emission Simulator v4 (MOVES4)<sup>4</sup>.

Density Gasoline (E10)			
Fuel Type	Grams to lbs	Gasoline Density*	Lbs per Gallon Gasoline
E10	0.00220462	2829	6.23686998

MOVES4 Default 2026 Summer Weekday July Refuelling Spillage Emissions Uncontrolled .7 lb/1000gal Grams Per Day	
County	VOC Refueling Spillage
Davis	98406
Salt Lake	327475
Weber	61537
Tooele	37028
Utah	167212
<b>Total</b>	<b>691658</b>

MOVES4 Default 2026 Summer Weekday July Refuelling Spillage Emissions Uncontrolled .7 lb/1000gal Lbs Per Day	
County	VOC Refueling Spillage
Davis	216.95
Salt Lake	721.96
Weber	135.67
Tooele	81.63
Utah	368.64
<b>Total</b>	<b>1524.84</b>

<sup>3</sup> CARB, Gasoline Dispensing Facilities Hose Emissions Inventory For Vacuum Assist and Conventional Hoses Appendix 4. <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2011/evr11/gdfhapp4.pdf>

<sup>4</sup> <https://www.epa.gov/moves/latest-version-motor-vehicle-emission-simulator-moves>

MOVES4 Default 2026 Summer Weekday July Refuelling Spillage Emissions Controlled .05 lb/1000gal Grams Per Day	
County	VOC Refueling Spillage
Davis	34722
Salt Lake	115475
Weber	20566
Tooele	17780
Utah	58978
Total	247521

MOVES4 Default 2026 Summer Weekday July Refuelling Spillage Emissions Controlled .05 lb/1000gal Lbs Per Day	
County	VOC Refueling Spillage
Davis	76.55
Salt Lake	254.58
Weber	45.34
Tooele	39.20
Utah	130.02
Total	545.69

% Reduction -64.21%

%Reduction -64.21%

MOVES4 Default 2026 Summer Weekday July Refuelling Spillage Emissions Uncontrolled .7 lb/1000gal Gallons Per Day	
County	VOC Refueling Spillage
Davis	34.8
Salt Lake	115.8
Weber	21.8
Tooele	13.1
Utah	59.1
Total	244.5

MOVES4 Default 2026 Summer Weekday July Refuelling Spillage Emissions Controlled .05 lb/1000gal Gallons Per Day	
County	VOC Refueling Spillage
Davis	12.3
Salt Lake	40.8
Weber	7.3
Tooele	6.3
Utah	20.8
Total	87.5

## MOVES4 County Year Table

countyID	yearID	refuelingVaporProgramAdjust	refuelingSpillProgramAdjust
49011	2026	0	0.92857
49035	2026	0	0.92857
49045	2026	0	0.92857
49049	2026	0	0.92857
49057	2026	0	0.92857

Control efficiency -92.86%

Gallons Saved Per Day 157.0

(157 gal/day) (365 days/yr) (6.24 lb/gal)/2000 lb/ton = 179 tons/yr fuel emission control.

Conclusion: The adoption of dripless nozzles would result in the reduction of 179 tons per year of VOC emissions.

## Combined Emission Reductions

When taken together, the adoption of CP - 207 certified nozzles and hoses resulting in a total 214.96 tpy, or 0.59 tons per day, of VOC emissions reductions from within the 5 applicable counties.

## Costs

To estimate the incremental costs associated with the adoption of CP - 207 certified nozzles and low permeability tubing, the Utah Division of Air Quality identified the cost associated with conventional equipment and compared that to the costs associated with certified equipment.

Capital and Incremental Costs:

- Costs for hoses<sup>5</sup>:
  - Conventional hose: \$268 mean upfront capital cost
  - CP-207 certified hose: \$451 mean upfront capital costs for 8 feet per hose.
  - Incremental costs of low permeation hoses: (\$451 - \$268) \$183 per eight feet of hose.
  - Total incremental cost of all hoses: (\$183 x 13,726) \$2,511,858.

---

<sup>5</sup> The cost for nozzles greatly ranges from under \$100 for a basic nozzle without auto-shutoff and spill guard to nearly \$600 for the most expensive nozzle. UDAQ researched the retail cost of 3 types of common dripless nozzles certified by CARB. The cost for these nozzles ranged in price from \$373-\$568 with a mean price of \$478. Conventional nozzles with auto shut-off and spill guards range from \$150-\$340 with a mean price of \$188.

- Costs for nozzles<sup>6</sup>:
  - Conventional nozzles: \$188 mean upfront capital costs.
  - CP - 207 certified nozzles: \$478 mean upfront capital cost.
  - Per nozzle incremental cost relative to a traditional nozzle: ( $\$478 - \$188$ ) \$290 per nozzle.
  - Total incremental cost of nozzles: ( $\$290 \times 13,726$ ) \$3,980,540.
- Total incremental capital cost for both hoses and nozzles: \$6,492,398.

#### Cost Savings:

The UDAQ has identified a lifetime cost savings over the anticipated three-year lifetime of the dripless nozzles and low permeable hoses resulting from the reduction of lost gasoline products for consumers.

- Low Permeable Hoses: 11,526 gal / year saved hoses ( $\$3/\text{gal}$ ) = \$34,579 saved / year
  - $\$34,579 \times 3 \text{ years} = \$103,737$
  - \$103,737 lifetime savings for consumers.
- Dripless Nozzles: 157 gal/day \* 365 days = 57,305 gal saved per year
  - $57,305 \text{ gal} * \$3.00(\text{per gal}) = \$171,915$  per year
  - $\$171,915 \times 3 \text{ years} = \$515,745$
  - \$515,745 lifetime savings for consumers.
- Total lifetime savings to consumers: \$619,482.

---

<sup>6</sup> UDAQ researched the retail cost for 2 types of common hoses certified by CARB. The cost for 8 ft low permeation hoses range from \$304-\$598 with a mean price of \$451. Conventional comparable hoses range from \$150-\$394 (pricing was available from 3 manufacturers) with a mean price of \$268.