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Fill 'er Up

Areas of the state striving to improve air quality are getting assistance at neighborhood gas stations. Stage I and Stage II vapor recovery ensures that harmful gasoline vapors do not escape into the atmosphere during fueling.

Gasoline vapors can be captured during fueling

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Motorists pulling up to a gasoline pump usually have one big decision: regular or premium? From there, it's fairly routine to fill the tank and wash the windshield.

But what appears routine on the surface belies the fact that a complex system might be in place to keep gasoline vapors from entering the atmosphere. This protection benefits the environment and everyone sharing the region's air quality.

Pollution prevention measures known as Stage I and Stage II vapor recovery are found in El Paso and the eastern portion of Texas, where ozone levels in some urban areas have exceeded federal standards.

Vapor recovery occurs in two forms:

- **Stage I** recovers vapors forced out of the petroleum storage tank during fuel deliveries to the station. These vapors are returned to the delivery truck's gasoline fuel compartment.
- **Stage II** recovers the vapors forced out of a motor vehicle's fuel tank during refueling and returns these vapors to the station's storage tank through a nozzle spout and vapor return hose.

Gasoline vapor contains many chemicals that can lead to poor air quality. Some of these chemicals, such as benzene, are known to be toxic or carcinogenic.

When released into the air, these volatile organic compounds (VOCs) contribute to the formation of ground-level ozone. Stage I and II vapor recoveries are required by the federal Clean Air Act in states having ozone nonattainment areas.

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Systems Address Air Quality

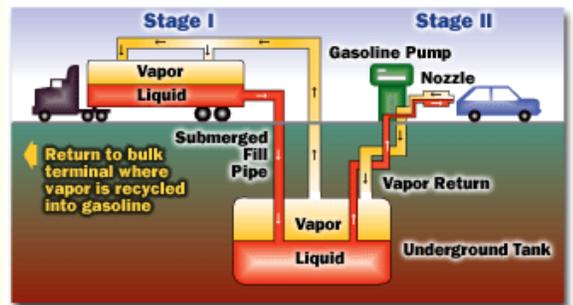
In Texas, gasoline-dispensing facilities must be equipped with Stage I and Stage II vapor recovery equipment if they are located in any of the 16 counties designated as nonattainment for ozone. The counties are:

- Houston-Galveston area: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller.
- Dallas-Fort Worth area: Collin, Dallas, Denton, and Tarrant.
- Beaumont-Port Arthur area: Hardin, Jefferson, and Orange.
- El Paso County.

In these counties, motorists who look closely will notice specially equipped nozzles and hoses at their local service station or convenience store. This equipment is part of Stage II vapor recovery, which captures VOCs at a vehicle's gasoline tank and returns the vapors to the storage tank.

But first, gasoline has to be delivered to the station. Fuel trucks take on large volumes of gasoline--usually 8,000

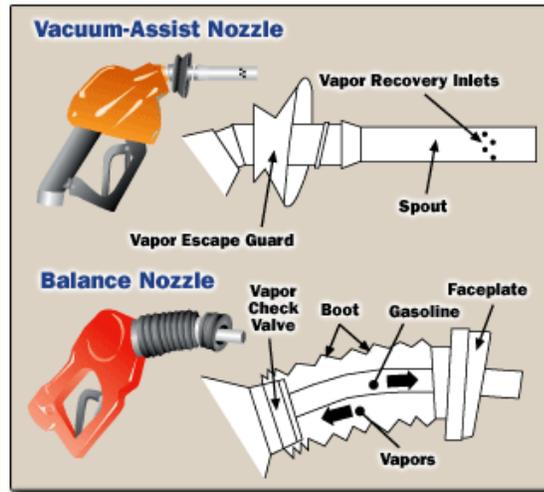
Two Forms of Vapor Recovery



At service stations with both Stage I and Stage II vapor recovery, special equipment is in place to keep vapors from escaping during the fueling of the storage tank and individual vehicles. While gasoline is being pumped through one hose, vapors are being returned through another hose.

gallons--at a loading terminal and travel to individual stations to transfer the fuel to underground or aboveground storage tanks. Small gasoline stations will have a couple of tanks holding 5,000 to 10,000 gallons each, while high-volume, multilane stations can have up to six 30,000-gallon storage tanks.

Two Types of Nozzle Spouts



A vacuum-assist vapor recovery system uses a pump to draw vapors from the vehicle fuel tank as the vehicle is being fueled. The vapors are captured through a ring of holes located at the tip of the nozzle spout. With another method, called a balance system, vapors are recovered through an accordion-shaped bellow found around the nozzle spout. This system uses the force of the gasoline entering the vehicle to push vapors back to the storage tank.

During fueling, VOC vapors are collected by the Stage I vapor recovery system, which is activated by a connecting hose that allows the transfer of vapors from the storage tank back to the truck's empty tank compartment. When the fuel truck returns to the terminal, the vapors are processed or recycled to liquid gasoline.

Stage I vapor recovery is required in 95 counties, most of which lie east of Interstate 35. Most facilities pumping fewer than 125,000 gallons a month are exempt. Stage I is required at facilities required to have Stage II controls because Stage II cannot operate properly without Stage I controls. In some counties, Stage I is all that is required.

With Stage II, vapors are retrieved through one of two methods. As the tank is filled, the vacuum-assist system uses a vacuum pump to draw the displaced vapors. The vapors generally are captured through a ring of holes located at the tip of the nozzle spout. The other method, a balance system, relies on the force of the gasoline entering the vehicle to push vapors back to the storage tank. The vapors are recovered through an accordion-shaped bellow found around the nozzle spout.

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Retail and Nonretail Facilities Affected

In counties required to have vapor recovery, the requirements apply to both public and private facilities that dispense gasoline. Not only are gasoline stations affected, but so are companies and governmental organizations with large fleets. All gasoline-dispensing facilities are required by the TCEQ to comply with annual testing procedures and proper operation and maintenance.

The TCEQ has initiated several changes in the vapor recovery program. In December 2004, the Austin and San Antonio areas agreed to enact Stage I vapor recovery at stations selling more than 25,000 gallons of fuel a month. This step is expected to help those metropolitan areas reach compliance with federal air quality standards.

This spring, the TCEQ will decide on other proposed revisions to Stage I and II vapor recovery rules to increase flexibility for new facilities to use new technologies. For more information, see revisions to vapor recovery rules.

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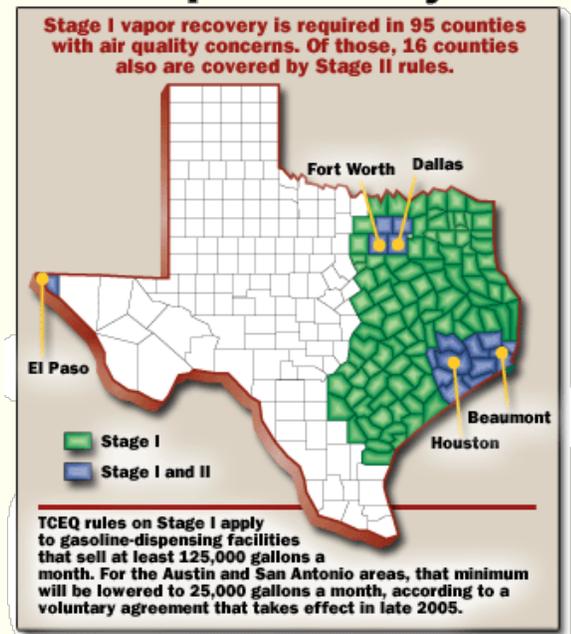
"Topping off" the tank--or continuing to pump gasoline after the nozzle clicks off--is an unwise practice that merely runs up the price at the pump.

Gasoline nozzles are designed to shut off automatically when the fuel tank is full. So attempts to force more fuel into the tank do not work. The gasoline actually gets stuck in the hose or spills onto the ground, creating a potential groundwater contaminant.

That's not all. Topping off may block the station's vapor recovery system, allowing harmful vapors to escape.

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Counties with Vapor Recovery



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