



The U.S. Department of Energy’s Office of Fossil Energy (FE) supports research and development of technologies that can reduce the volume of natural gas (e.g., methane) flared or vented (released) into the atmosphere during crude oil and natural gas exploration, production, processing, transportation, and storage operations. This fact sheet was created by FE to inform stakeholders on state-level production and regulatory activity regarding natural gas flaring and venting. FE’s research portfolio includes efforts to reduce methane (and other hydrocarbon) flaring through the application of improved technologies to capture and utilize small volumes of natural gas at remote locations, as well as technologies to reduce (primarily) methane release during midstream gas processing and transportation. Intermittent flaring that occurs as a result of routine well testing, production facility process shutdowns, or facility and pipeline infrastructure maintenance, are normal aspects of safe oil and natural gas production. Increases in domestic oil and natural gas production have resulted in significant infrastructure buildouts, however, natural gas pipeline capacity constraints have led to regional increases in the flaring of associated gas in some unconventional plays (e.g., Permian Basin in Texas and New Mexico and Bakken Shale in North Dakota) in order to enable oil production.

Virginia Producing Plays and Basins

The oil and natural gas productive area of the Appalachian Basin extends slightly across the western border of Virginia (Figure 1). As reported by the [Virginia Department of Mines, Minerals, and Energy](#) (DMME), small amounts of oil and gas condensate are produced from Paleozoic rocks in only a few counties (primarily Wise and Lee Counties) in the far western corner of the commonwealth. These include two oil fields in Lee County (Rose Hill and Ben Hur) and more than a dozen gas fields in Wise, Dickenson, and Buchanan Counties. [DMME reports](#) that some gas wells produce from formations at 3,000–6,000 feet, but the majority of wells produce coalbed methane from

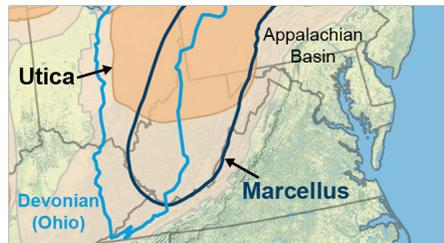


Figure 1: Virginia oil and gas producing areas Source: EIA

depths of 1,800–2,200 feet in fields like Nora, Oak Wood, and Middle Ridge. Wells testing the Devonian-aged shales along the western border of the state have not proven to be commercial. Mesozoic formations in the [Taylorsville Basin](#) north of Richmond, where hydrocarbons were found in the 1980s at depths between

1,000–5,500 feet, have garnered some interest from producers—but they have not proven commercial viability. The [U.S. Geological Survey](#) estimates undiscovered gas resources of more than 1 trillion cubic feet (Tcf) for the Taylorsville Basin.

Virginia has no significant crude oil reserves and only a small amount of crude oil production—all of which is from wells in the far southwestern corner of the state. Although Virginia holds less than 1 percent of the nation’s total natural gas reserves, the state contains one-fifth of U.S. coalbed methane proved reserves—the third-largest amount of any state. According to the [U.S. Energy Information Administration](#) (EIA), more than four-fifths of the state’s natural gas production comes from coalbed methane wells drilled

Virginia [Oil](#) and [Natural Gas](#) Statistics (EIA)

	2013	2014	2015	2016	2017	2018
Crude Oil Production (Average Barrels/Day)	27.0	38.0	30.0	19.0	19.0	11.0
Natural Gas Gross Withdrawals and Production (Average MMcf/Day) *	382	366	350	329	316	305 *
Natural Gas Gross Withdrawals and Production (Vented and Flared) (MMcf/Day)	DMME does not require operators in Virginia to measure or report venting or flaring volumes.*					
Natural Gas Gross Withdrawals and Production (Oil Wells) (Mcf/Day)	24.7	32.9	21.9	13.7	10.9	N/A
Natural Gas and Gas Producing Oil Wells	7,957	8,063	8,113	8,153	8,255	8,144 *

MMcf - million cubic feet

Mcf - thousand cubic feet

*Information provided by the Virginia Department of Mines, Minerals, and Energy

2017 ranking among 32 U.S. oil and natural gas producing states — [Oil](#): 29 [Natural Gas](#): 17

into coal-rich formations rather than from conventional natural gas reservoirs.

Virginia Key Regulations Associated with Flaring and Venting

DMME's [Division of Gas and Oil](#) regulates oil and gas operations, issues permits, and conducts inspections of well sites. The [Virginia Department of Environmental Quality](#) (DEQ) administers state and federal laws and regulations for air quality, issues permits, conducts inspections and monitoring, and enforces regulations and permits.

The [Virginia Gas and Oil Act](#) (Code of Virginia, Title 45.1, Chapter 22.1) and [Virginia Gas and Oil Regulations](#) (Virginia Administrative Code, Title 4, Agency 25, Chapter 150) stipulate that the Virginia Gas and Oil Board governs oil and gas exploration, drilling, and production operations. As outlined in section [45.1-361.27](#), the [Gas and Oil Board](#) Director has the authority to promulgate and enforce rules, regulations, and orders necessary to prevent the escape of the commonwealth's gas and oil resources, among other objectives.

Administrative Code [4VAC25-150-410](#), *Venting and Flaring of Gas; Escape of Oil*, prohibits well operators from allowing crude oil or natural gas to escape from any well, gathering pipeline, or storage tank. Specifically, this rule stipulates that operators shall not flare or vent any gas from a well for more than seven days after completion of the well. The exception to this rule is for situations involving well cleaning (such as when the blowing of gas is needed to remove accumulated formation fluid that has restricted efficient production); well safety; or for activities that are specifically excluded from the definition of "waste." The Virginia Gas and Oil Board Director may also provide approvals for other operational reasons that operators request in advance. Further, this rule requires that operators only use venting as a last resort when flaring is neither safe nor feasible.

In September 2018, Virginia [announced](#) its plans to develop regulations for limiting leaks of methane from natural gas infrastructure and landfills, with the DEQ starting its work on the methane-control framework. As of February 2019, Virginia established an [Ad Hoc Work Group](#) with cross-sector representatives "to support DEQ in the collection and evaluation of data to inform the regulation development process."

Virginia State Points of Contact

Virginia Department of Mines, Minerals, and Energy; Division of Gas and Oil

Contact this agency for additional information on oil and gas regulations.

Website: <https://www.dmme.virginia.gov/dgo/dgolandingpage.shtml>

Email: DgoInfo@dmme.virginia.gov

Phone: 276-415-9700

Virginia Department of Environmental Quality; Air Division

Contact the Air Division at Virginia DEQ for more information on compliance with air quality regulations.

Website: <https://www.deq.virginia.gov/Programs/Air.aspx>

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Visit energy.gov/fe/state-natural-gas-flaring-and-venting-regulations for a digital version of this fact sheet that includes hyperlinks to information sources.