

# Hydraulic Fracturing in Michigan

Michigan Oil & Gas Producers Education Foundation – Exploring Oil and Natural Gas through Education

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## Introduction

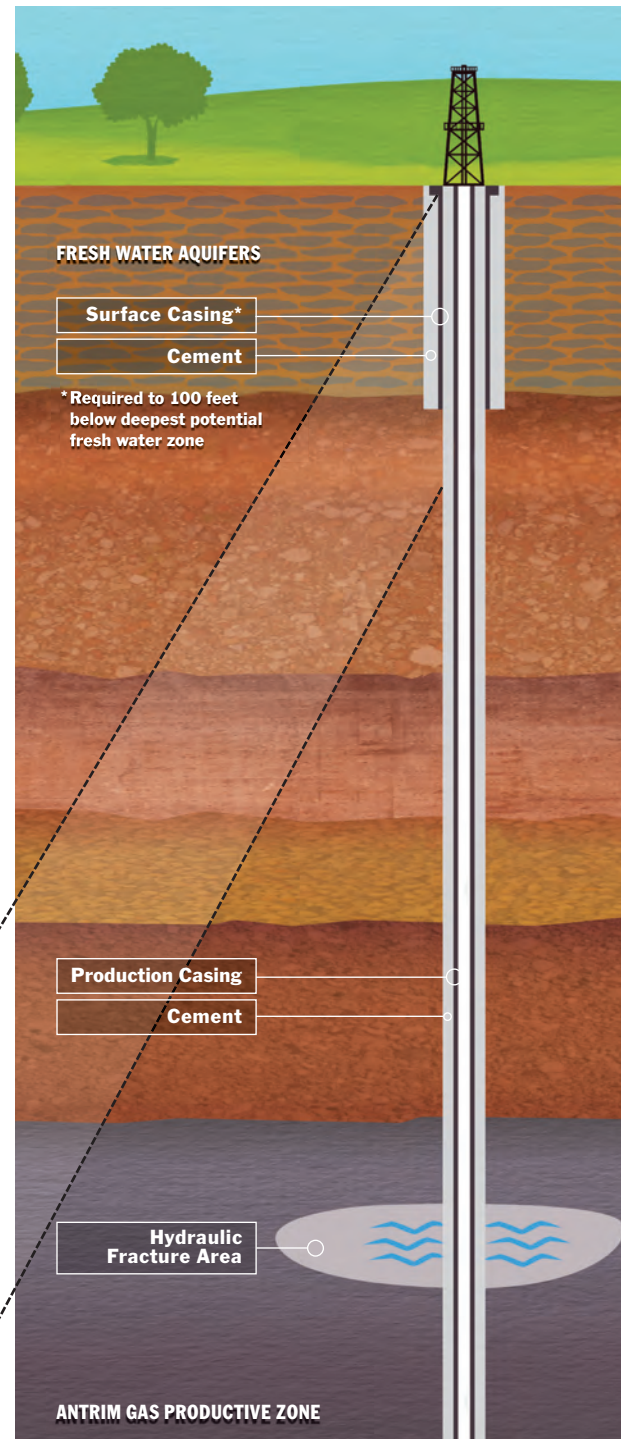
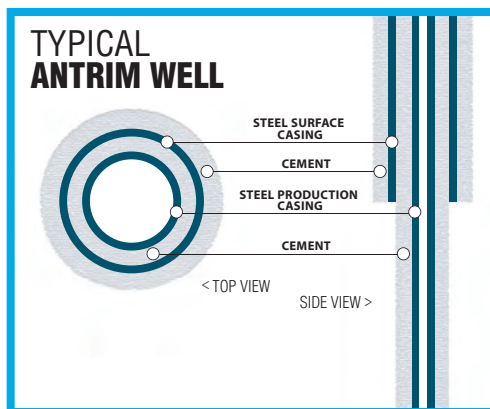
Michigan has a long history — beginning in 1925 with the discovery of the Saginaw Field — as one of the nation's major sources of natural gas and oil. Michigan's natural gas producers supply 21.8 percent of the natural gas used by Michigan residents and businesses for heating and energy needs (U.S. Energy Information Administration, 2009). Natural gas is clean and abundant, making it a reliable energy source for Michigan.

Home-state production of oil and gas benefits our state, its communities, and families in many ways. It enables energy security, supports thousands of Michigan jobs, and generates millions of dollars in tax revenues for state and local public services as well as royalties for the Michigan Natural Resources Trust Fund and the Michigan Game and Fish Fund. Thousands of private mineral owners also receive royalty income from production activities each year.

## Hydraulic fracturing in Michigan

Hydraulic fracturing is a safe, proven and essential process for recovering natural gas and oil from reserves found deep below the earth and often in tight rock. Low-permeability rock formations, such as the Antrim Shale formation, are common to Michigan's geology and contain stores of natural gas that are important to Michigan's energy supply.

In Michigan hydraulic fracturing has been used since the 1950s. An estimated 12,000 Michigan production wells have utilized the method for producing natural gas and oil effectively, efficiently, and safely. Michigan producers consistently have used hydraulic fracturing to meet our state's energy needs while protecting the environment.



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# Answers to Commonly Asked Questions

## What is hydraulic fracturing?

Hydraulic fracturing is a controlled operation that pumps mainly water, sand, and a small amount of additives into a well and down the casing/ tubing under high pressure. As the mixture is forced out through perforations in the well casing into the surrounding rock, the pressure causes the rock to fracture — creating additional fissures. The fractures are propped open with pumped sand, which enables gas and/or oil to flow from tight, or low permeability rock, to the well.

## What components comprise hydraulic fracturing fluids?

The fracturing fluid consists mainly of water and sand. A small amount (less than 2 percent) of additives is used to ensure the water-sand mixture works more effectively. Most additives are those we encounter everyday, such as disinfectants, table salt, bleach, mineral oil and sodium carbonate (used in water softeners).

## How is hydraulic fracturing fluid disposed?

In Michigan, fluids that flow back to the surface after the fracturing process are disposed of in deep disposal wells designed specifically for this purpose in accordance with state and federal regulations.

## Why is hydraulic fracturing necessary?

Hydraulic fracturing is essential to the successful development of a large percentage of oil and gas wells in Michigan. Many formations in Michigan have low permeability and could not produce economically viable volumes of natural gas without the use of hydraulic fracturing. The development of Michigan's Antrim formation for gas production — with nearly 3 trillion cubic feet of natural gas produced since 1987 — would not have been economically feasible if the wells had not been hydraulically fractured.

## How is hydraulic fracturing regulated?

The Michigan Department of Environmental Quality regulates every aspect of the oil and gas industry from the permitting of the well, through the drilling, completion, and production process, and through the eventual plugging of the well. Michigan's oil and gas regulations are comprehensive and have been developed through more than 85 years of experience. More than 12,000 wells in Michigan have been developed safely and without adverse environmental impacts using the hydraulic fracturing process.

## How is groundwater protected from potential contamination?

In Michigan fracturing operations take place in the oil and gas producing zone, which is below any freshwater aquifers. Each well drilled in Michigan is constructed with the protection of the environment and water resources in mind. Steel surface casing is set 100 feet below the deepest potential fresh water zone and cemented to the surface. An additional steel casing is set deeper through the production zone and cemented — ensuring that each well drilled has two layers of steel casing and two layers of cement to protect groundwater. Many deep wells also have a third casing extending about half the well depth, providing additional protection against potential fluid migration.

SPRING 2011

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