

WATER MANAGEMENT

/ RESPONSIBLE USE



“We need water. We need energy. It’s not a question of one or the other. It’s a matter of using both responsibly.”

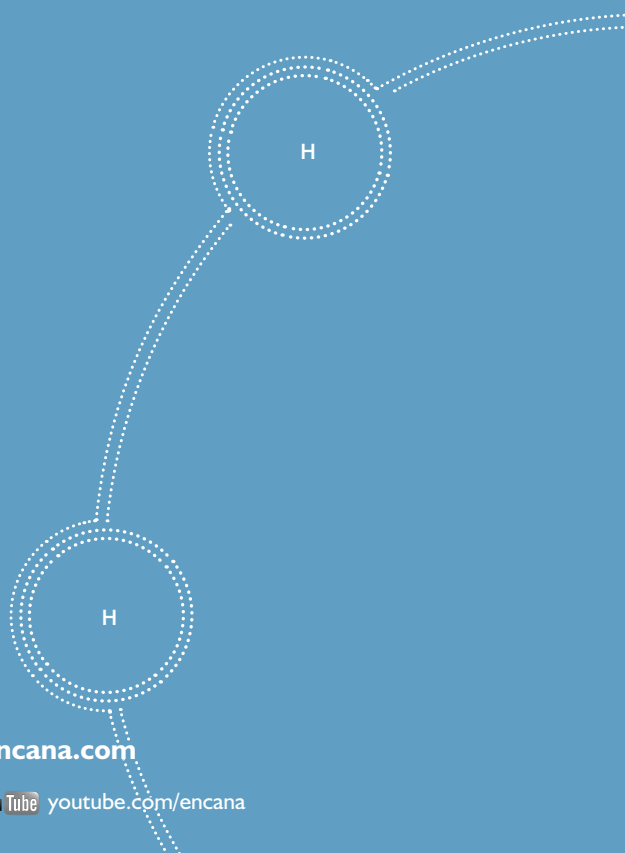
Energy is utilized in everything we do. From the moment we get out of bed, turn on the light and start brewing our morning cup of coffee, energy is being consumed from various forms of renewable and non-renewable resources.

We all need both energy and water. Water is a critical resource and Encana takes responsibility for the water we use extremely seriously. All forms of energy require water somewhere along their development cycle. In turn, energy is required to treat, transport and heat the water we use in our homes and businesses.

We take a responsible approach to the sourcing, use, transport and disposal of water.

DAVE LYE

Vice-President, Corporate EH&S,
Security & Corporate Responsibility



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ENERGY

Natural gas is a key energy source of the future, and North America is well positioned to meet the demand. Natural gas is critical to North America's lower carbon future.

"Natural gas is the viable energy option for a carbon-constrained world."

KEVIN BENETEAU
Team Lead, Air, Land & Water
Canadian Division

A graphic consisting of a blue square with a white wavy top edge. The number '65%' is written in white in the center of the square.

65%

Natural gas is clean, producing up to 65 percent less emissions than coal and 25 percent less than oil.

A graphic consisting of a white square with a blue wavy bottom edge. The number '30%' is written in blue in the center of the square.

30%

Natural gas is affordable, in many regions up to 30 percent less expensive as a transportation fuel than diesel or gasoline.

WHY USE NATURAL GAS AS OUR SOURCE OF ENERGY?

A domestic and proven source of energy, natural gas makes up about 23 percent of the energy mix in Canada and the U.S. With an estimated 100 years' supply in Canada and the U.S., at current consumption rates, this underutilized resource presents an opportunity to shift North America's energy mix and incorporate more natural gas into transportation and power generation.

Natural gas is the clear energy choice in meeting the increased demand for energy while at the same time reducing our overall carbon footprint.

A shift towards renewable energy is a viable solution to cut carbon emissions. However, North American demand is simply too high to be supported entirely by renewable energy sources.

Natural gas is affordable, it can support renewable technology, and it is a reliable source of energy when the wind doesn't blow or the sun doesn't shine.

Natural gas is the cleanest fossil fuel. Composed mostly of methane, the combustion by-products of natural gas are carbon dioxide (CO₂) and water vapour, the same compounds we exhale. Natural gas produces 25 percent less CO₂ emissions than oil and up

to 65 percent less CO₂ emissions than coal.

NATURAL GAS DEVELOPMENT DEPENDS UPON WATER

So do our contractors and employees who live and work in the same communities as our stakeholders.

We adapt our water management approach to address geological factors, local water resources, stakeholder feedback and operational needs. This means no single water management approach works in all of Encana's operating areas and the water sources we use vary from region to region.

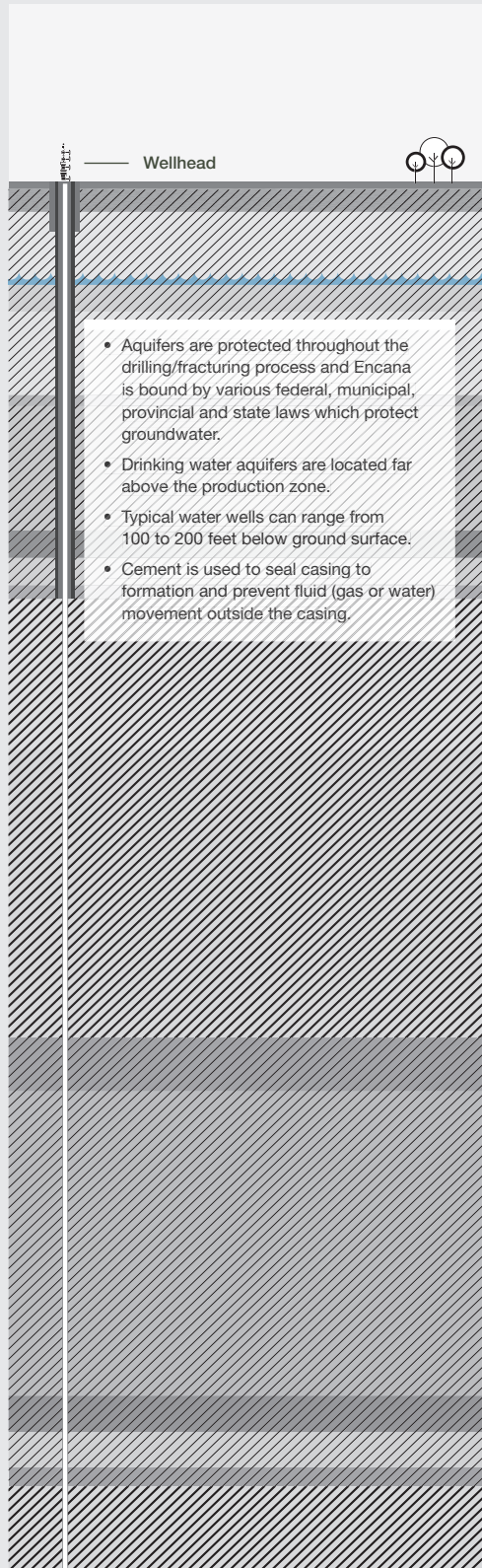
Protecting water resources and using them wisely is important

to Encana's continued success. We recognize that our water requirements and the challenges posed by our operations require tailored approaches to water management.

We seek opportunities to use unutilized sources of water. This could be water that's located far deeper than typical water wells and drinking water aquifers. It also could be too poor a quality of water for household or other industrial use. And, where we can, we seek to recycle or reuse water in our operations.

Where produced water cannot be recycled, it is disposed of responsibly to avoid the contamination of freshwater resources or land.

PROTECTION



PROTECTING WATER DURING DRILLING

Encana has proven processes in place to protect groundwater and minimize environmental impact before, during and after the drilling process.

Before drilling, we may conduct predevelopment or baseline groundwater sampling. In some jurisdictions, such as the coalbed methane development in Alberta, groundwater testing is currently required by regulation. In other areas the scope and extent of predevelopment or baseline groundwater testing is determined by site-specific factors including the depth and quality of local groundwater resources, the current and expected use of the groundwater in the area and the proximity to groundwater users and potential users.

In addition to the natural barriers formed by thousands of feet of dense rock formations, we take numerous measures to ensure the integrity of the wellbore and eliminate any pathway from the wellbore to drinking water formations.

Wellbore construction is critical to protecting groundwater. Encana takes

great care to design and install effective well casing systems.

Surface casing, a section of steel pipe, is cemented in place deeper than aquifers used for drinking water and isolates shallow groundwater from geologic formations that produce natural gas. Numerous tests are run to ensure the quality and integrity of the casing and cement.

Depending on the unique characteristic of the subsurface, sometimes Encana will install a second string of casing – called intermediate casing.

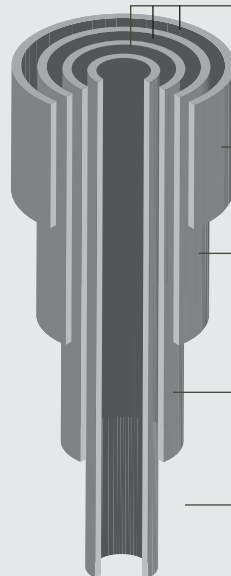
On a deep horizontal well, Encana drills the well to a total vertical depth ranging from approximately 6,500 feet to 15,000 feet.

Drilling then continues into the horizontal portion of the well that extends up to 9,800 feet into the producing formation.

Once the horizontal section of the well is drilled, a third string of protection – the production casing – is run into the wellbore. Horizontal drilling allows for the extraction of larger quantities of natural gas from a single well.

Typical Well Casing Diagram

(Not to Scale)



Cement – the engineered steel casing system is cemented externally to prevent any fluids from migrating from the wellbore to groundwater aquifers

Conductor Casing – used to maintain integrity during initial drilling operations

Surface Casing – steel pipe protects groundwater/aquifers. Depth is dependent on depth of aquifers and/or pressure of reservoir, but is generally deeper than regional aquifers; cemented in place with cement running between the earth and the pipe

Intermediate Casing – required in certain wells, depending on reservoir pressure; set to top of the producing formation

Production Casing – runs to bottom of well; often cemented all the way to surface

PROTECTING WATER DURING HYDRAULIC FRACTURING

Most of Encana's water use happens during hydraulic fracturing operations.

Virtually every natural gas well drilled today requires some type of stimulation to allow the gas to flow to the wellbore. The goal of hydraulic fracturing is to enhance recovery by creating pathways for the natural gas trapped in the rock to flow up the wellbore to production equipment at the surface. It is this path of least resistance that channels the natural gas into the wellbore.

This controlled operation pumps a mixture of fluids (primarily water) and a propping agent through the wellbore to the target formation at a high pressure in multiple intervals, or stages. The process breaks up the target formation, much like a stone fracturing a windshield, to create pathways that allow the gas to flow from the very low permeability reservoir toward the wellbore.

In all Encana operations, rigorous water management and protection are vital parts of this process. As noted above, proper wellbore design and a steel casing system prevent fluids migrating from the wellbore and protect local groundwater.

The extreme pressure exerted by the rock above the fracturing zones limits the distance new fractures can travel. Along with those safeguards, Encana uses multiple techniques to fully monitor each hydraulic fracture treatment it conducts. Encana ensures the integrity of the casing and cement system through field inspection and wellbore logging.

Before we begin completion operations, we pressure-test to ensure integrity. We then constantly monitor pressures during each fracturing operation. Any flow of fluids into non-targeted areas would immediately be detected by a sudden loss in pressure and operations would be halted.

Hydraulic fracturing processes are strictly regulated by various state or provincial government agencies today. Encana meets and, in many cases exceeds, the requirements set out by the regulators.

We continue to build upon our detailed understanding of the chemicals used in the hydraulic fracturing process to ensure the company is using the most responsible hydraulic fracturing fluid formulations and fluid management practices available.



The production zone is far below the surface and thousands of feet below freshwater aquifers. A deep horizontal well can have a vertical depth of up to 15,000 feet (almost three miles) which equals up to 10 Empire State Buildings in height.



www.encana.com/news/topics/hydraulicfracturing/

- Fracture water and produced water are kept isolated from groundwater.
- Water and sand are required to fracture rock and increase permeability to remove gas.
- Encana constantly monitors pressures during each hydraulic fracturing operation. Any flow of fluids into non-targeted areas would immediately be detected by a sudden loss in pressure and operations would be halted.

PRODUCTION DEPTH / UP TO 15,000 FEET BELOW THE SURFACE

“We collaborate with third parties to fund important water-related research.”

DOUG HOCK

Team Lead, Community & Public Relations
USA Division

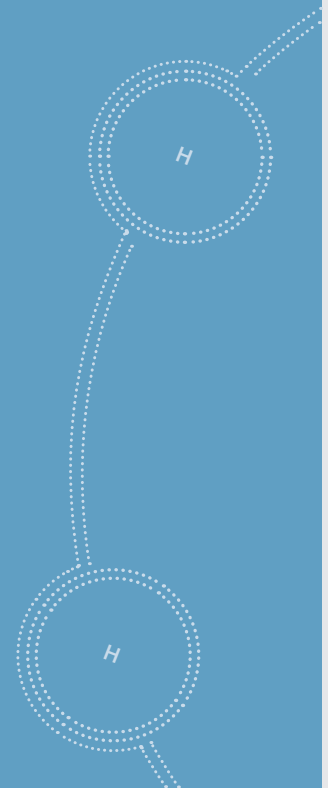
In Colorado, Encana participates in the Piceance Basin Water Data Repository project. This database, maintained by the US Geological Survey, consists of a publicly accessible website that contains water sampling data from locations throughout the Piceance Basin provided by industry, government and citizens. In addition to maintaining the database, USGS provides technical papers and abstracts based upon the data gathered. Over the long term this database will help industry, regulators and stakeholders better understand what impacts, if any, oil and gas development is having on groundwater in the basin.

In the Peace Region of British Columbia (B.C.), the Kiskatinaw River watershed is the only source of water for the City of Dawson Creek and Village of Pouce Coupe. Encana has supported water research work by the University of Northern British Columbia. This research monitors surface water

and groundwater levels in the Kiskatinaw watershed and furthers knowledge about the surface and groundwater hydrology in this area.

Also in B.C., Encana has supported the Horn River and Montney water projects being run by Geoscience BC. This industry-led, industry-focused, applied geoscience organization encourages minerals and oil and gas exploration investment in British Columbia through the collection, interpretation and marketing of publicly available, applied geoscience.

The Montney Water Project is designed to provide a comprehensive inventory of water sources and potential for deep geological disposal sites in the Cutbank Ridge Resource Play area of northeastern B.C. by creating a comprehensive database of surface water, groundwater and deep saline aquifers in the area.



APPROACH

Water is vital to our daily lives. The use of water plays a crucial role in developing natural gas resources. Protecting this natural resource and using it wisely is important to Encana's continued success.

WATER TREATMENT IN COLORADO

Since 2003, we've been using an extensive water treatment and distribution system to support our drilling and well completion operations in Colorado's Piceance Basin.

Produced water is removed from the wells, along with natural gas, from thousands of feet below ground surface.

Because of its salt content (up to 30 times higher than drinking water) this water is unsuitable for domestic or livestock use. Encana's facilities in four locations are designed to treat about 45,000 barrels of water per day and allow recycling of produced water.

Produced water from our wells and flowback water from well completion operations is transported to these facilities by truck and an extensive network of pipelines. In the region, we also continue to build

pipeline infrastructure to minimize the need for trucking water and over the course of 2010 we installed another 10 miles of water pipelines.

The treatment facilities provide hydrocarbon and solids removal through gravity separation, chemical and heat addition methods. Once treated, the water is stored in secure holding ponds until it is reused in completion activities, and the cycle begins again. Improving the quality of the water waiting to be recycled makes it less hazardous to wildlife and improves air quality. The separated hydrocarbons are stored in tanks for future sale. Through this voluntary hydrocarbon removal and water treatment system, Encana is able to recycle up to 90 percent of the water produced during drilling, completion and production operations, greatly reducing the amount of freshwater used, thereby conserving this important natural resource.

SOURCING SALINE WATER IN BRITISH COLUMBIA

In 2007, Encana and Apache Corporation began an active drilling program in British Columbia's Horn River Basin. Given the low permeability of the Horn River, hydraulic fracturing of the target formation is required to recover natural gas from this play. Water management was a key concern identified by Encana and brought forward by stakeholders during public meetings about developments in the basin. Encana sought alternatives to surface freshwater use to supply hydraulic fracturing operations. What followed was the identification of the Debolt formation, a deep, sub-surface, unutilized aquifer containing saline, sour (containing hydrogen sulphide) water. Test results indicated

that the Debolt formation is capable of supplying water for fracturing operations and for disposal of spent fracturing fluids or produced water. The Debolt formation occurs at depths of approximately 1,600 feet to 3,600 feet below the surface and holds saline water unfit for most common uses. Tapping this water source required many innovations, including the investigation of several "sweetening" methods needed to remove hydrogen sulphide (H₂S) and make this water usable for industrial purposes. A water treatment plant was designed and built and since it began operation in June 2010, surface water use has been significantly reduced. In 2010 alone, a total of five million barrels of Debolt water were used in completion

operations, which in the past would have been sourced from surface sources. In 2011, the plant is expected to treat more than 12.5 million barrels of water, meaning only about 10 percent of the water required for hydraulic fracturing operations is sourced from surface water sources. This initiative reduces the need for surface water sources and relieves some of the pressure on the local watershed.

WATER TRANSPORT IN ALBERTA

By constructing a water storage pond on its Kakwa property in west-central Alberta, Encana is optimizing collection of surface water flow and providing a permanent wetland and water body habitat for wildlife use in the future. The water required to develop the Kakwa resource was being purchased from the

municipality of Grande Cache, Alberta and trucked to the Kakwa Field, a round trip of about 90 miles.

At a development rate of 40 wells per year, approximately 3,000 truckloads of water per year would be required. The stakeholders near Encana's Kakwa operations were concerned with the amount of truck traffic that would be added to their main transportation route which is narrow, steep and winding.

By constructing the water storage pond, we fulfill our water use requirements within the Kakwa field, which eliminates the need to use municipal water, reduces truck traffic, associated emissions from that traffic and the costs of purchasing and transporting water from Grande Cache.