

CAPP Hydraulic Fracturing Operating Practice: WATER SOURCING, MEASUREMENT AND REUSE

OVERVIEW

To support CAPP's Guiding Principles for Hydraulic Fracturing, seven Operating Practices have been developed in collaboration with CAPP member companies. These Operating Practices strengthen industry's commitment to continuous performance improvement in shale gas, tight gas and tight oil development.

The Water Sourcing, Measurement and Reuse Operating Practice supports the Guiding Principles: **“We will safeguard the quality and quantity of regional surface and groundwater resources, through sound wellbore construction practices, sourcing fresh water alternatives where appropriate, and recycling water for reuse as much as practical”**; **“We will measure and disclose our water use with the goal of continuing to reduce our effect on the environment”**; and **“We will continue to advance, collaborate on and communicate technologies and best practices that reduce the potential environmental risks of hydraulic fracturing.”**

WHAT DOES THIS PRACTICE MEAN?

CAPP and its member companies recognize that water is a resource we all share. We put great emphasis on the need to use and manage water responsibly in our operations. For shale gas, tight gas and tight oil developments, water is typically only required for well drilling and completion and not for the actual production of the gas and oil. Some of the water injected during fracturing operations is recovered with the hydrocarbon, and is either recycled for reuse in another operation or disposed of according to regulations. This practice outlines the requirements for companies to evaluate available water supply sources, measure water use and reuse water as much as practical in hydraulic fracturing operations.

HOW WILL THIS WORK?

Under this Operating Practice, companies will safeguard water quantity through assessment and measurement of water sources (including recycled water). As with all industrial operations, the volume of water that can be withdrawn is approved by the provincial regulator to ensure sustainability of the resource. This practice includes:

- Complying with withdrawal limits and reporting requirements of water licences/permits. Also, collecting and reporting water use data through CAPP's Responsible Canadian Energy™ Program.
- Implementing a decision-making framework to evaluate and understand available water sources.
- Monitoring surface water and groundwater quantity data, as required to demonstrate sustainability of the water source; and collaborating with other companies on best practices.

TECHNICAL DESCRIPTION

The purpose of this practice is to describe minimum requirements for safeguarding water quantity through assessment and measurement of water sources, including recycled water, in shale gas, tight gas and tight oil hydraulic fracturing operations.

The objective of this practice is to enable and demonstrate conformance with the following CAPP Guiding Principles for Hydraulic Fracturing:

We will safeguard the quality and quantity of regional surface and groundwater resources, through sound wellbore construction practices, sourcing fresh water alternatives where appropriate, and recycling water for reuse as much as practical.

We will measure and disclose our water use with the goal of continuing to reduce our effect on the environment.

We will continue to advance, collaborate on and communicate technologies and best practices that reduce the potential environmental risks of hydraulic fracturing.

BACKGROUND

Hydraulic fracturing is a controlled operation that pumps a fluid and a propping agent through the wellbore to the target geological formation at high pressure in multiple intervals or stages, in order to create fractures in the formation and facilitate production of hydrocarbons. Hydraulic fracturing is a safe and proven way to develop natural gas and oil; it has been used throughout the oil and gas industry for about 60 years.

Fracturing fluids are comprised primarily of water and propping agent, with a very small amount of additives. The volume of water used depends on the number of fractures, the number of wells, and the characteristics of the rock in the reservoir. Unlike many enhanced oil recovery techniques where water is injected into the reservoir over the life of the well, once a shale gas, tight gas or tight oil well is completed, it typically does not require any additional water for production. Some of the water used for hydraulic fracturing in the reservoirs is recovered with the hydrocarbon, and is either recycled for reuse in another operation or disposed of according to appropriate environmental regulations.

SCOPE

This practice applies to CAPP member companies engaged in the development of shale gas, tight gas or tight oil resources through the application of hydraulic fracturing processes in Canada. While use of this practice is voluntary (subject to applicable laws and regulations), CAPP strongly encourages its use by member companies.

The practice is to be utilized to support the evaluation of available water supply sources, measurement of water use, and reuse of flowback and produced water.

Operational Requirements

CAPP member companies meet or exceed the following requirements when sourcing, measuring or reusing water:

1. Required licences/permits will be obtained for water that is withdrawn, as these provide limits and reporting requirements established by the regulator to protect the water resource.
2. Potential sources of water (both temporary and permanent) for hydraulic fracturing will be evaluated to ensure sustainability of the water resource while balancing social and economic considerations. These may include:
 - a. Flowback
 - b. Produced water
 - c. Saline groundwater
 - d. Wastewater
 - e. Non-saline groundwater
 - f. Surface water
3. The sustainability and safeguarding of surface water and groundwater quantity will be demonstrated by monitoring appropriate parameters (e.g. pressure, volume, water levels, precipitation data), as required for the following water sources:
 - a. Saline groundwater
 - b. Non-saline groundwater
 - c. Surface water
4. Measurement data related to water use will be collected for:
 - a. Water sourced
 - b. Water injected and disposed
 - c. Produced water/flowback generated
5. Permanent surface water allocations will be based on flow or water level monitoring, as approved by the jurisdiction; i.e., the amount of water that can be withdrawn is dependent on how much water is actually available.
6. Demonstrate collaboration and sharing of best practices with other operators regarding water sourcing, measurement and reuse, and reporting of data.

Performance Measures

Conformance with this practice will be confirmed by demonstrating that:

- A decision-making framework is in place to ensure water source options are assessed and understood, including recycling flowback/produced water for reuse.
- Procedures are in place for the collection of monitoring and measurement data related to water quantity and use.
- Procedures are in place for the measurement and reporting of key water management metrics as identified in CAPP's Responsible Canadian Energy™ program.

Reporting Expectations

Companies are expected to make their process for water sourcing, measurement and reuse publicly available.



DEFINITIONS

Flowback: The flow of fracturing fluid back to the wellbore after treatment is completed.

Fresh (non-saline)

groundwater: Groundwater that has a total dissolved solids (TDS) content less than or equal to 4,000 mg/L or as defined by the jurisdiction.

Produced water: Water naturally present in the reservoir or injected into the reservoir to enhance production, produced as a co-product when gas or oil is produced.

Propping agent (Proppant): Typically non-compressible material, most commonly sand,

added to the fracturing fluid and pumped into the open fractures to prop them open once the fracturing pressures are removed.

Recycle: The process of treating flowback or produced water to allow it to be reused either for hydraulic fracturing or for another purpose.

Reuse: The process of using water multiple times for similar purposes.

Saline groundwater: Groundwater that has a total dissolved solids (TDS) content more than 4,000 mg/L or as defined by the jurisdiction.

Shale gas, tight gas and tight oil: For the purposes of this practice, shale gas, tight gas and tight oil refers to unconventional resources from low permeability reservoirs being developed using horizontal wells with multi-stage hydraulic fracturing.

Surface water: Water collecting on the ground or in a stream, river, lake, sea or ocean, as opposed to groundwater.

Wastewater: Spent or used water with dissolved or suspended solids, discharged from homes, commercial establishments, farms and industries.