

PRODUCED WATER

The OGC ensures regulatory compliance for the disposal of produced water

Introduction to Coalbed Gas(CBG)

CBG is a natural gas “attached” to the coal and kept in place by the **pressure** of naturally occurring water in the coal seam. It generally consists of over 95 per cent methane. CBG can be found in most coalfields across the province. Coalbed gas requires very little processing to remove impurities and is very similar to the processed conventional natural gas being produced and consumed in B.C.

What is Produced Water ?

During **coalbed gas** testing and production, water that naturally occurs in the coal seams is pumped out, which reduces pressure and allows gas to be released (Figure 1). Typically, the methane and produced water are separated at the wellhead. The water is brought to surface at the wellhead and is considered ‘**produced**’ water. The volume of water, and its quality, can vary greatly based on the underlying geology. The produced water is piped or trucked to the injection site for disposal.

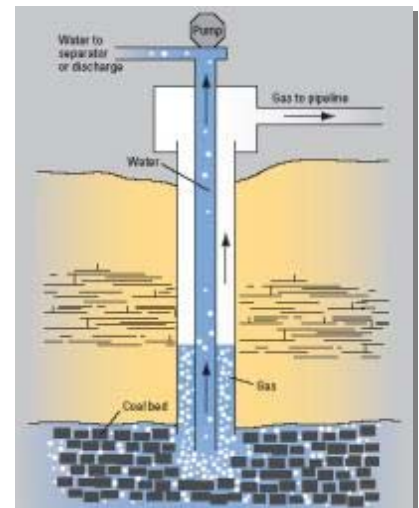


Figure 1 Water held in coal seams is brought to the surface.

This water is disposed of by pumping it back into a ‘**disposal or injection**’ well, (see Figure 2) drilled into a deep underground rock formation. This is common practice in the petroleum industry and regulations and practices have been developed to ensure protection of domestic groundwater resources.

Disposal Wells and the Protection of Groundwater

The **disposal or injection well** is carefully designed to confine disposed water to an authorized geological zone and to prevent the movement of fluids to potable groundwater sources. **Injection wells** are drilled into geologic rock formations. These wells are drilled and cased with steel pipe. The pipe is cemented in place to prevent the migration of fluids into potable groundwater zones. Cement is placed behind the long string casing for tens to hundreds of metres above the **injection zone** to prevent fluids from migrating upward. The long string casing and cement sheath are perforated in the **injection zone** to allow produced water to flow into the zone to be captured and permanently disposed.

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The fluid pressure, fracture pressure, water compatibility chemistry and geological characteristics of the **injection zone** are taken into consideration when evaluating areas suitable for injection.

Confining or cap zones are impermeable (leak proof) rock formations that restrict the upward movement of the produced water. Confining zones overlie the injection zone.

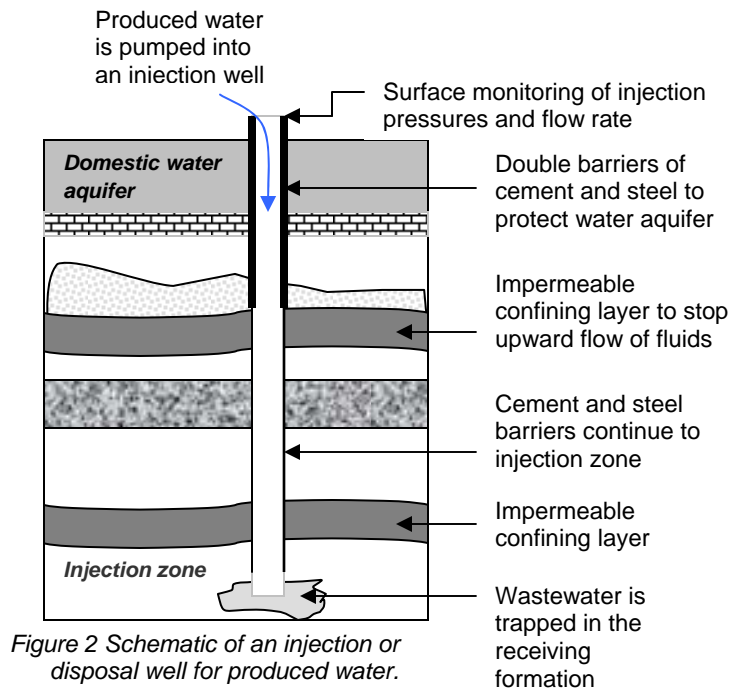


Figure 2 Schematic of an injection or disposal well for produced water.

OGC's Role

The OGC reviews applications for disposal of produced water to ensure:

- oil and gas resources are not impacted
- the proposed disposal or injection zone is compatible with the produced water
- the produced water will remain within the underground formation
- the applicant has obtained the necessary rights to the formation.

Companies apply to the Oil and Gas Commission if they wish to drill and operate a disposal well for produced water. Before the OGC approves an application for a disposal well, applicants must demonstrate that underground disposal areas are isolated from potential groundwater zones. To protect drinking water against any possibility of cross-contamination, all disposal wells are lined with steel casing that extends from the surface to the disposal rock formation. This casing is cemented into the well bore.

Monitoring

As a condition of approval, the Commission requires a Monthly Injection/Disposal Statement, reporting volume of disposed water and average wellhead pressure (Figure 3). The OGC limits the pressure at which water can be re-injected into the underground rock formation to ensure integrity of the injection zone.

Information

Oil and Gas Commission Guidelines for Approval to Dispose of Produced Water
https://www.ogc.gov.bc.ca/arb/arb_print.asp_aoid=49.html