

Common Oil & Gas Traps

In a typical trap, gas accumulates on top of the reservoir as a "gas cap" over the "oil leg" which in turn overlies the water-saturated zone in the reservoir. This occurs because natural gas is lighter than oil which is lighter than water. However, all three fluids are often intermingled in parts of the reservoir. Porosity is the ability of rock to hold oil and gas like water in a sponge. Permeability indicates how easily fluids can flow through the rock.

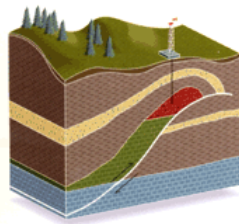
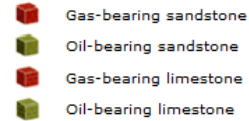
A trap requires three elements:

- a porous reservoir rock to accumulate the oil and gas - typically *sandstones*, limestones and dolomites.
- an overlying impermeable rock to prevent the oil and gas from escaping
- a source for the oil and gas, typically black waxy *shales*.

Rock Types

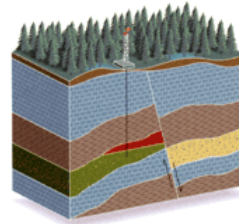


Reservoir Rocks



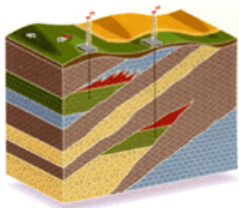
1 Thrust Fault

In the foothills of Western Canada, east of the Rockies, the original limestone layer was first folded and then thrust-faulted over itself. An overlying seal of impermeable rock completes the structural trap. Examples include the Turner Valley oil and gas field and Jumping Pound gas field, both in south-western Alberta.



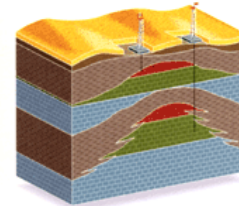
2 Normal Fault

Faults drop one side down and push the other side up to place the reservoir rock against impermeable sealing rocks, forming a structural fault trap. An example is the Dunvegan gas field in northwestern Alberta.



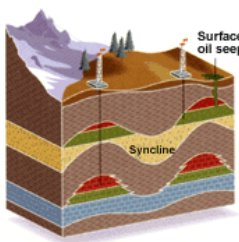
3 Stratigraphic Pinch-Out

This occurs where the porous limestone reservoir loses its porosity and becomes impermeable limestone, or the porous sandstone reservoir simply thins and pinches out. Overlying impermeable rocks act as seals. Examples include the D-1 Crossfield sour gas field and many oil and gas fields in Saskatchewan.



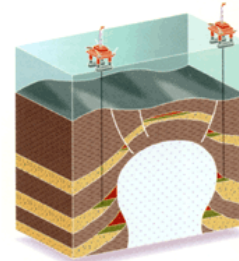
4 Reef

Porous ancient coral reefs grew in the warm seas that once covered much of Western Canada. They now provide prolific oil and gas reservoirs. Often overlying porous rock layers are "draped," or folded over the reefs and form separate traps. Overlying impermeable shales act as seals to the reservoirs. An example is the Leduc oil and gas field in Alberta.



5 Anticlines

Where rock layers are folded into anticlines and synclines, the oil and gas migrates to the crests of the anticlines within the reservoir rock, and are trapped if overlain by an impermeable layer. If fractures occur, oil and gas may seep to the surface. Examples include the Bubbles and Jedney gas fields in northeastern British Columbia and the famous Jed Clampit discovery.



6 Salt Dome

Under the weight of overlying rock layers, layers of salt will push their way toward the surface in salt domes and ridges. Oil and gas are trapped in folds and along faults above the dome and within upturned porous sandstones along the flanks of the dome. Examples are found off Canada's East Coast.