

## OIL & GAS INDUSTRY GLOSSARY

**Abandoned Well:** A well is abandoned if it is a dry hole when it is drilled or if it has stopped gas or oil production. The well abandonment process involves two stages: the removal of equipment such as production tubing, casing and surface equipment for use or resale; and the cementing of the wellbore.

**Acidizing:** Many wells, particularly in tight zones, require well stimulation to improve the flow of gas or oil. The most common method of stimulation is acidizing, which involves the injection of acids under pressure into the formation to increase flow rates. Acidizing helps clean the effects of drilling out of the well and creates channels in the rock to increase flow.

**Aggregator:** A corporation (usually independent of producers) that buys gas from a pool of producers and then transports and resells it to large buyers such as local distribution companies (LDCs), independent power plants or other large industrial users.

**Allowable Production Rates:** The rate of production for a well that has been set by the appropriate provincial or federal authority. The allowable production rate is typically less than the productive capacity of the well unless the producer receives Good Production Practice (GPP) approval, which then allows production at an increased capacity in accordance with good oilfield practice.

**Aquifer:** An underground water reservoir contained between layers of rock, sand or gravel.

**Associated Gas:** Gas that is produced as the secondary product from the same formation from which oil is being produced as the primary product.

**Backwardation:** Futures markets such as the NYMEX oil or natural gas contracts are in backwardation when the front month is priced at a premium to future months.

**Barrel of Oil:** A unit of volume equal to 42 U.S. gallons.

**Barrel of Oil Equivalent (BOE):** It is a method of reporting used in the oil and gas industry to equate oil, natural gas and natural gas liquids. The typical standard, used in the majority of the world, is to calculate BOEs based on the relative energy content and convert natural gas to BOE at the rate of six mcf of natural gas to equal one BOE. Barrels of natural gas liquids are usually converted at an equal basis (one barrel equals one BOE) to BOEs. In Canada, a BOE conversion factor of 10 mcf of natural gas to equal one BOE is also used. This conversion rate was the normal rate used in Canada, because for many years (prior to 2000) this rate was a closer approximation to the relative economic value of gas and oil.

**Basin:** A depression in the earth's crust in which sedimentary materials have accumulated. Such a basin may contain oil or gas fields.

**Battery:** The principal field equipment used to process oil. It can include equipment to separate water and other impurities, as well as to provide field storage for processed oil.

**BCF (billion cubic feet):** The cubic foot is a standard unit of measure for gas at atmospheric pressure.

**Behind Pipe:** If a well drills through several pay zones and is completed in the deepest productive reservoir, casing is set all the way down to the producing zone. Viewed from (a perspective) inside the borehole, reserves in the shallower pay zones up the hole are behind the casing.

**Biomass:** Any organic material, such as wood, plants, and organic wastes that can be turned into fuel.

**Bleeding Core:** A core sample of rock so highly permeable and saturated that oil drips from it.

**Blind Pool:** Refers to an oil and gas limited partnership which has not committed to specific prospects, leases, or properties at the time of capital formation.

**Blowout:** A blowout refers to an unplanned and uncontrolled flow of gas, oil or other fluids from a well. Producers typically understand that certain zones and drilling operations have a higher potential for blowouts.

**Blowout Preventer (BOP):** Equipment that is installed at the wellhead to control pressures and fluids during drilling, completion and certain remedial operations to restore production.

**British Thermal Unit (BTU):** The quantity of heat needed to raise the temperature of one pound of water by 1 degree Fahrenheit at or near 39.21 Fahrenheit.

**Butane:** A normally gaseous straight chain or branched chain hydrocarbon.

**Casing:** The two most relevant casings are the intermediate casing and the production casing. The intermediate casing is typically set in zones above the productive targets. The primary purpose is to provide a permanent structural support for the wellbore to limit the potential of collapse or cave in. The second purpose is to prevent uphole water zones from entering the production. The production casing typically runs the entire length of the wellbore and, in most cases today, runs through the bottom of the productive zone. In these cases, the well is perforated (holes shot into the casing with a perforation gun) for production purposes. Casing is part of the process of completing a well.

**Cement:** Fluid cement is mixed at the surface, pumped to the bottom of a cased well, forced to flow around the lower end of the casing and up into the space between the casing and the borehole. When the cement solidifies (sets), it holds the casing in place, and provides support.

**Cement Squeeze:** Forcing cement into the perforations, large cracks, and fissures in the wall of a borehole to seal them off.

**Choke:** An orifice installed in a pipeline at the well surface to control the rate of flow.

**Christmas Tree:** An assembly of valves, gauges, and chokes mounted on a well casinghead to control production and the flow of oil to the pipelines.

**Coal Bed Methane Gas:** Natural gas generated and trapped in coal seams.

**Cogenerator:** A power generation facility that typically takes one energy source (i.e., gas) and produces electricity and a second energy output (i.e., steam) that is used for industrial or heating purposes. Cogeneration projects are typically located at a major industrial usage site, such as a manufacturing or other plant facility.

**Coil Tubing:** Continuous, jointless tubing that is stored on a reel and can be uncoiled or coiled repeatedly as required. The use of coil tubing is increasing, as traditional tubing requires the connection of a number of joined sections of pipe. One key advantage of coil tubing is the reduced time needed to run the tubing into or out of the wellbore.

**Coking:** A process used to break down heavy oil molecules into lighter ones by removing the carbon, which remains as a coke residue.

**Combined Cycle Generation:** Electricity generation plants wherein the steam generated in a cogeneration process is used to create additional electricity. The most common other electricity source is gas.

**Completion:** The process of completing a successful oil or gas well for production.

**Compressor:** A machine used to boost natural gas pressure to move it through pipelines or other facilities. The reservoir pressure of a gas well declines over time. As reservoir pressure declines, it falls below the pressure of the gas in the gathering system or pipeline, resulting in an increasing inability of the well to produce at its productive capacity. Compression is added to increase the pressure of the produced gas, which allows it to produce at its productive capacity into the line pressure of the pipeline.

**Condensate:** Hydrocarbons usually produced with natural gas that is liquid at normal pressure and temperature.

**Contango:** Futures markets such as the NYMEX oil or natural gas contracts are in contango when the future months are priced at a premium to the front month.

**Conventional Crude Oil:** Petroleum found in liquid form, flowing naturally or capable of being pumped without further processing or dilution.

**Core:** A continuous cylinder of the reservoir rock, usually from five to 10 centimeters in diameter, cut from the bottom of a wellbore to provide a sample of the reservoir rock for analysis.

**Critical Sour Gas Wells:** A sour gas well that has the potential to release unsafe levels of hydrogen sulphide that might affect nearby residents.

**Crown Land:** Petroleum, natural gas and other mineral rights owned by the federal or provincial governments in Canada. Rights to explore and produce are granted in a variety of forms, including leases, licenses and permits in a variety of time periods. The majority of conventional rights are held in the form of five year leases.

**Crude Oil:** A mixture of hydrocarbons that exists in liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through the separating facilities at the surface. Crude oil may also include small amounts of hydrocarbons that exist in the gaseous phase in natural underground reservoirs but are liquid at atmospheric pressure after being recovered from an oil well (casinghead gas) in lease separators. Subsequently, these hydrocarbons are co mingled with the crude stream without being measured separately. Also, crude may include small amounts of non hydrocarbons produced with the oil, such as sulfur and other compounds.

**Crude Oil Equivalent:** A measure of energy content that converts units of different kinds of energy into the energy equivalent of barrels of oil.

**Cubic Foot:** The volume of gas that fills a cube that is one foot of one foot by one foot under set temperature and pressure conditions.

The standard pressure is 14.73 psia and the standard temperature is 601 Fahrenheit.

**Darcy:** Darcies or millidarcies refer to the measure of rock permeability (i.e., the degree to which natural gas and crude oil can move through the rocks).

**Density:** The heaviness of crude oil, generally measured in degrees on the American Petroleum Institute (API) gravity scale.

**Directional (Deviated) Well:** A well drilled at an angle from the vertical by using a slanted drilling rig or by deflecting the drill bit. Directional wells are used to drill multiple wells from a common drilling pad or to reach a subsurface location beneath land where drilling cannot be done. The practice of drilling multiple wells from one pad is common in heavy oil regions, as it allows the operator to minimize the surface land requirements.

**Distillates:** The products of condensation during the fractional distillation process (gaseous fuels, naphtha, gasoline, kerosene and gas oils).

**Downstream:** All operations taking place after crude oil is produced, such as transportation, refining, and marketing.

**Drill Bit:** The part of the drilling tool that cuts through rock strata.

**Drill String:** Also called drill pipe or drill stem. Thirty-foot lengths of steel tubing screwed together to form a pipe connecting the drill bit to the drilling rig. The string is rotated to drill the hole and also serves as a conduit for drilling mud.

**Drilling:** The act of boring a hole through which oil or gas may be produced if encountered in commercial quantities.

**Drilling Break:** A sudden increase in the rate of drilling.

**Drilling Mud:** A mixture of clay, water, chemical additives, and weighting materials that flushes rock cuttings from a well, lubricates and cools the drill bit, maintains the required pressure at the bottom of the well, prevents the wall of the borehole from crumbling or collapsing, and prevents other fluids from entering the well bore.

**Drilling Platform:** An offshore structure with legs anchored to the sea bottom that supports the drilling of up to 35 wells from one location.

**Drilling Rig:** The surface equipment used to drill for oil or gas, consisting chiefly of a derrick, a winch for lifting and lowering drill pipe, a rotary table to turn the drill pipe, and engines to drive the winch and rotary table.

**Drillstem Test:** A test through the drill pipe prior to completion to determine if oil or gas is present in a formation.

**Drill Pipe:** Steel pipe sections, approximately nine metres long, that are screwed together to form a continuous pipe extending from the drilling rig to the drilling bit at the bottom of the hole.

**Drill String:** The column or string of drill pipe.

**Drillstem Test (DST):** A method of sampling fluid from a formation using a tool attached to the drillstem. The sample is used to assess the type and volume of fluids in the formation as well as pressure and flow rate.

**Dry Gas:** Natural gas from the well that is free of liquid hydrocarbons, or gas that has been treated to remove all liquids, otherwise known as pipeline gas.

**Dry Hole:** An unsuccessful well; a well not capable of producing commercial quantities of oil or gas.

**Enhanced Oil Recovery (EOR):** Any method that increases oil production by using techniques or materials that are not part of normal pressure maintenance or water flooding operations.

**Established Reserves:** Refers to proven reserves plus 50% of probable recoverable reserves. The reference to 50% of probable reserves is different from the P50 reserves terminology used in international areas, such as the North Sea. P50 reserves refer to the engineer's estimate of recoverable reserves under its 50% probability estimate.

**Ethane:** A normally gaseous straight chain hydrocarbon. It is a colourless, paraffinic gas that boils at a temperature of 127.48 degrees Fahrenheit. It is extracted from natural gas and refinery gas streams.

**Ethylene:** An olefinic hydrocarbon recovered from refinery processes or petrochemical processes.

**Farm In:** When one company drills wells or performs other activity on another company's lease in order to earn an interest in or acquire that lease.

**Federal Energy Regulation Commission (FERC):** A U.S. agency that has jurisdiction over natural gas companies and producers that sell or transport gas in interstate commerce for resale (i.e., they set tariffs for interstate pipelines).

**Fishing:** Recovering the tools or pipe that have been accidentally lost down the borehole by using specially designed tools that screw into or grab the missing equipment.

**Fishing Tools:** Special instruments equipped with the means for recovering objects lost while drilling the well.

**Flaring:** The burning of gas vented through a pipe or stack at a refinery, or a method of disposing of gas while a well is being drilled. Venting (letting gas escape unburned) is generally prohibited.

**Flooding:** One of the methods of enhanced oil recovery. Water flooding or gas flooding might be considered secondary recovery methods.

**Flowing Well:** A well that produces through natural reservoir pressure and does not require pumping.

**Formation:** A geological term that describes a succession of strata similar enough to form a distinctive geological unit useful for mapping or description.

**Fossil Fuels:** Fuels that originate from the remains of living things, such as coal, oil, natural gas, and peat.

**Fracing:** The practice of pumping special fluids down the well under high pressure. Fracing causes the formation to crack open, creating passages for the reservoir fluids to more easily flow into the wellbore.

**Fuel Switching:** The ability of a boiler to burn alternate fuels, such as gas or residual fuel oil.

**Gas:** There are three forms of matter: liquid, solid and gas. Gas is characterized by the fact that it has neither shape nor specific volume it expands to fill the entire container in which it is held.

**Gas Cap:** A layer of free gas on top of the oil zone in an underground reservoir. In Western Canada there are typically restrictions on production of gas caps until it is determined that the production of gas does not affect the ultimate recoverability of the oil reserves.

**Gas in Place (GIP):** The volume of gas in a reservoir at any given time, including both recoverable and non recoverable gas, calculated at standard temperature and pressure conditions.

**Gas Processing Plant:** Any facility that performs one of the following: removing liquefiable hydrocarbons from wet gas or casinghead gas (i.e. gas processing); removing undesirable gaseous and particulate elements from natural gas (i.e. gas treatment); or removing water or moisture from the gas stream (i.e. dehydration).

**Gathering System:** A system of pipelines, compressor stations and other related facilities that gather natural gas from the supply region and transport it to the major transmission systems.

**Heavy Oil:** A type of crude petroleum characterized by high viscosity and a high carbon-to-hydrogen ration. It is usually difficult and costly to produce by conventional techniques.

**Horizontal Drilling:** Drilling a well that deviates from the vertical and travels horizontally through a producing layer.

**Infill Drilling:** Wells drilled between established producing wells on a lease in order to increase production from the reservoir.

**Injection Well:** A well used for injecting fluids (air, steam, water, natural gas, gas liquids, surfactants, alkalines, polymers, etc.) into an underground formation for the purpose of increasing recovery efficiency.

**In-Situ Production:** Various methods used to recover deeply buried bitumen deposits, including steam injection, solvent injection and firefloods.

**Joint Venture:** A large-scale project in which two or more parties (usually oil companies) cooperate. One supplies funds and the other actually carries out the project. Each participant retains control over his share, including liability and the right to sell.

**Landman:** An individual who secures oil and gas leases, checks legal titles, and attempts to cure title defects so that drilling can begin.

**Linepack:** The volume of gas that needs to be kept in the pipe of a gathering, transmission or distribution system in order to maintain the minimum operating pressure of the system.

**Liquefied Natural Gas (LNG):** Super cooled natural gas that is maintained as a liquid at 160 degrees Celsius. LNG occupies 1/640th of its original volume and is therefore easier to transport if pipelines cannot be used.

**Logs:** Detailed depth related records of certain significant details of an oil or gas well. There are a number of logs to measure different characteristics. The logs are obtained by lowering measurement instruments into a well attached to an electric wireline.

**Lost Circulation:** A serious condition that occurs when drilling mud pumped into the well does not return to the surface, but goes into the porous formation, crevices, or caverns instead.

**Methane:** A hydrocarbon gas that is the principal constituent of natural gas.

**Migration:** The movement of oil and gas through layers of rock deep in the earth.

**Milling:** Cutting a "window" in a well's casing with a tool lowered into the hole on the drillstring.

**Mineral Rights:** The ownership of all rights to gas, oil, or other minerals as they naturally occur in place, at or below the surface of a

tract of land.

**MMCF (Million Cubic Feet):** The cubic foot is a standard unit of measure for quantities of gas at atmospheric pressure.

**Monocline:** A geologic formation in which all the strata are inclined in the same direction.

**Mud:** Drilling mud, also referred to as drilling fluid, has three principal purposes. First, the drilling contractor controls the weight or density of the mud to prevent well blowouts. The vast majority of wells are drilled overbalanced, which means the density of the mud creates pressure in the wellbore greater than the pressure of the target formation. Second, the drilling mud is re-circulated up the well and carries with it the cuttings and fines from the drilling operations. Third, the drilling fluid provides lubrication and cooling to the drillbit to prevent wear and tear.

**Natural Gas Liquids (NGLs):** Liquids obtained during natural gas production and processing, including ethane, propane, butane and condensate.

**Netback Price:** This is another term that should be clarified when used in reporting. Netback prices typically refer to marketing pricing arrangements and represent the effective price received by the producer after subtracting the cost of shipping (if paid for by the producer). A different term is operating netback, which refers to the net operating income from a well and represents the price for the commodity less royalties and operating expenses. A third term is corporate netback, which refers to a producer's operating netback less interest expense, G&A costs, and cash taxes.

**Nitrous Oxide:** A greenhouse gas that has a large number of natural sources and is a secondary product of the burning of organic material and fossil fuels.

**Non Associated Gas:** A reservoir where only gas is found, crude oil is not present.

**Offset Well:** A well drilled near the discovery well. Also a well drilled to prevent oil and gas from draining from one tract of land to another where a well is being drilled or is already producing.

**Oil Column:** The vertical height (thickness) of an oil accumulation above the oil-water contact.

**Oil Gravity:** The density of liquid hydrocarbons, generally measured in degrees.

**Oil In Place:** The crude oil estimated to exist in a field or a reservoir. Oil in the formation not yet produced.

**Oil Pool:** An underground reservoir containing oil. An oil field may contain one or more pools, each of which has its own pressure system.

**Oil Rig:** A drilling rig that drills for oil and gas.

**Oil Shale:** A fine-grained, sedimentary rock that contains kerogen, a partially formed oil. Kerogen can be extracted by heating the shale, but at a very high cost.

**Oilfield Services:** Service companies that do work in and for the oilfield. These services may include: cementing, perforating, trucking, logging, etc.

**Oil Sands:** A deposit of sand saturated with bitumen. The two principal methods of recovering oil from oil sands are by mining (i.e. syncrude) and from steam-assisted gravity drainage (SAGD).

**Operator:** The company or individual responsible for managing an exploration, development or production operation. The operator is usually the partner with the largest working interest.

**Packer:** An expanding plug used in a well to seal off certain sections of the tubing or casing when cementing and acidizing or when a production formation is to be isolated.

**Pay Zones:** The term to describe the reservoir that is producing oil and gas within a given wellbore. Pay zones (or oil reservoirs) can vary in thickness from one foot to several hundred feet.

**Perforating Gun:** An instrument lowered at the end of a wireline into a cased well. It contains explosive charges that can be electronically detonated from the surface.

**Perforation:** A method of making holes through the casing opposite the producing formation to allow the oil or gas to flow into the well.

**Permeability:** Refers to the connectivity of the pores in the formation. Permeability is essential to the flow of the gas or oil within the formation to the wellbore and is measured in darcies or millidarcies.

**Plugging a Well:** Filling the borehole of an abandoned well with mud and cement to prevent the flow of water or oil from one strata to another or to the surface.

**Pool:** 1) Noun - An underground reservoir containing or appearing to contain a common accumulation of oil and natural gas. A zone of a structure which is completely separated from any other zone in the same structure is a pool. 2) Verb - To combine two or more tracts of land into one unit for drilling purposes. This may be accomplished voluntarily, or through compulsion.

**Pooling:** A term frequently used interchangeably with "Unitization" but more properly used to denominate the bringing together of small tracts sufficient for the granting of a well permit under applicable spacing rules.

**Porosity:** A measure of the number and size of the spaces between each particle in a rock. Porosity affects the amount of liquid and gases, such as natural gas and crude oil, that a given reservoir can contain.

**Possible Reserves:** Areas in which production of crude oil is presumed possible owing to geological inference of a strongly speculative nature.

**Probable Reserves:** Areas which are unproven but presumed capable of production because of geological inference, for instance, proximity to proven reserves in the same reservoir.

**Propane:** A normally gaseous straight chain hydrocarbon. It is a colourless paraffinic gas that boils at a room temperature of -43.67 Fahrenheit. It is extracted from natural gas or refinery gas streams.

**Propylene:** An olefinic hydrocarbon recovered from refinery or petrochemical processes.

**Reclamation:** The restoration of land to its original condition by regrading contours and replanting after the land has been mined, drilled, or otherwise has undergone alteration from its original state.

**Recoverable Resources:** An estimate of resources, including oil and/or natural gas, both proved and undiscovered, that would be economically extractable under specified price-cost relationships and technological conditions.

**Reef:** A buildup of limestone formed by skeletal remains of marine organisms. It often makes an excellent reservoir for petroleum.

**Refiner:** A person or company that has any part in the control or management of any operation by which the physical or chemical characteristics of petroleum or petroleum products are changed.

**Refining:** Manufacturing petroleum products by a series of processes that separate crude oil into its major components and blend or convert these components into a wide range of finished products, such as gasoline or jet fuel.

**Reserve Life Index (RLI):** Also known as the reserves to-production (R/P) ratio in the U.S., the reserve life index measures the length of time current proved/established reserves would last if current production rates were maintained and no new reserves were added.

**Reservoir:** A porous, permeable sedimentary rock formation containing quantities of oil and/or gas enclosed or surrounded by layers of less permeable or impervious rock. Also called a "horizon."

**Reservoir Pressure:** The pressure at the face of the producing formation when the well is shut-in. It equals the shut in pressure at the wellhead plus the weight of the column of oil in the hole.

**Rotary Drilling:** A method of well-drilling that employs a rotating bit and drilling mud to cut through rock formations.

**Roughnecks:** Members of the drilling crew.

**Round Trip:** Pulling the drillpipe from the hole to change the bit, then running the drillpipe and new bit back in the hole.

**Royalty:** The owner's share of production or revenue retained by government (crown royalties) or freehold mineral rights holders (freehold royalties). In Canada, the majority of crown royalties are based on a sliding scale, with higher royalties on higher volume wells and at higher prices.

**Secondary Recovery:** The extraction of additional crude oil, natural gas and related substances from reservoirs through pressure maintenance techniques such as waterflooding and gas injection.

**Seismic Exploration:** A method of prospecting for oil or gas by sending shock waves into the earth. Different rocks transmit, reflect, or refract sound waves at different speeds, so when vibrations at the surface send sound waves into the earth in all directions, they reflect to the surface at a distance and angle from the sound source that indicates the depth of the interface. These reflections are recorded and analyzed to map underground formations.

**Seismograph:** A device that records natural or manmade vibrations from the earth. Geologists read what it has recorded to evaluate the oil potential of underground formations.

**Service Rig:** A truck mounted rig, usually smaller than a drilling rig, that is brought in to complete a well or to perform maintenance, replace equipment or improve production.

**Set Casing:** To install steel pipe or casing in a wellbore. An accompanying operation is the cementing of the casing in place by surrounding it with a wall of cement extending for all or part of the depth of the well.

**Shut in Well:** A well that has been completed but is not producing. A well may be shut in for tests, repairs, to await construction of gathering lines or until economic conditions improve.

**Spot Market:** A short-term contract (typically 30 days) for the sale or purchase of a specified quantity of oil or gas at a specified price.

**Spud:** To spud a well means to start the initial drilling operations.

**Sour Gas:** Raw natural gas with a concentration of sulphur compounds, such as hydrogen sulphide.

**Sour Oil:** Crude oil containing free sulphur, hydrogen sulphide or other sulphur compounds.

**Steam Injection:** An improved recovery technique in which steam is injected into a reservoir to reduce the viscosity of the crude oil or bitumen.

**Steam Assisted Gravity Drainage (SAGD):** A recovery technique for extraction of heavy oil or bitumen that involves: drilling a pair of horizontal wells one above the other. One well is used for steam injection and the other for production.

**Stimulating the Formation:** A technique for improving production from a reservoir. Stimulation may involve acidizing, fracturing or simply cleaning out sand.

**Storage Facilities:** Facilities used for storing natural gas. The principal gas storage facilities are owned by local distribution companies and are usually salt caverns or depleted natural gas or crude oil reservoirs. Gas storage facilities are used to supply peak gas requirements.

**Strategic Petroleum Reserve (SPR):** Petroleum stocks maintained by the U.S. federal government for use during periods of major supply interruption. The reserve was created for emergency use in the event of supply interruptions. The reserve is not normally used, and the recent agreement to release inventories was indicated as being to protect heating oil supplies this winter.

**Surface Casing:** The first string of casing put into a well; it is cemented into place and serves to shut out shallow water formations and as a foundation for well control.

**Sweet Crude:** Crude oil with low sulfur content which is less corrosive, burns cleaner, and requires less processing to yield valuable products.

**Sweet Gas:** Raw natural gas with a relatively low concentration of sulphur compounds, such as hydrogen sulphide.

**Synthetic Crude:** A mixture of hydrocarbons, similar to crude oil, that results from the upgrading of bitumen from oil sands.

**Tight Hole:** A well about which the operator keeps all information secret.

**Ultimate Potential:** An estimate of recoverable reserves that will have been produced by the time all exploration and development activity is completed. This estimate includes production to date, remaining reserves, development of existing pools and new discoveries.

**Underbalanced Drilling:** Using mud lightened by the addition of nitrogen or other gas to minimize damage to the producing reservoir from drilling fluids during the drilling process. The pressure of the drilling mud is less than the pressure in the reservoir, and the well is produced while drilling under a controlled blowout situation.

**Unitization:** Process whereby owners of adjoining properties pool reserves into a single unit operated by one of the owners. Production is divided among the owners according to the unitization agreement. Generally put in place to provide an equitable sharing of the resource and to maximize overall pool recoveries.

**Upgrading:** The process of converting heavy oil or bitumen into synthetic crude oil.

**Upstream:** Activities concerned with finding petroleum and producing it, compared to downstream which are all the operations that take place after production.

**Viscosity:** The resistance to flow or stickiness of a fluid.

**Waterflooding:** A secondary recovery method in which water is injected into a reservoir to force additional oil into the wells.

**Wellhead:** The equipment used to maintain surface control of a well.

**West Texas Intermediate:** Refers to a grade of crude oil produced in the Permian and Midland basin areas of west Texas. The price paid for crude oil varies according to quality.

**Wet:** A reservoir rock is said to be "wet" when it contains water but no hydrocarbons.

**Wet Gas:** Natural gas containing liquid hydrocarbons - commonly condensate.

**Wildcat:** An exploration well drilled to a reservoir, from which no oil or gas has previously been produced in the nearby surrounding area.

**Wildcatter:** An operator who drills the first well in unproven territory.

**Working Interest:** An interest created by the execution of an oil and gas lease.

**Workover:** To clean out or work on a well to restore or increase production.

**Workover Rig:** The rig used when oilmen try to restore or increase a well's production.

**Wireline Logging Tools:** Special tools or equipment, such as logging tools, packers or measuring devices, designed to be lowered into the well on a wireline (small diameter steel cable).

**Working Interest:** The interest in a mineral property that entitles the owner to a portion of the production from the property.

**Zone:** A specific interval of rock strata containing one or more reservoirs, used interchangeably with "formation".

**Zone Isolation:** Sealing off a producing formation while a hole is being deepened. A special sealant is injected into the formation where it hardens long enough for the hole to be drilled. Afterward, the substance again turns to liquid, unblocking the formation.