

## The Lease Pumper's Handbook

### GLOSSARY OF PRODUCTION TERMS

This glossary focuses on oilfield production terms. The meanings of most entries are limited to an explanation of the term's use in oil and gas production and may not include all meanings of the word or words. Words found in basic dictionaries are not generally included. Some abbreviations are included.

**Abandon.** To cease production of a well or the use of a piece of equipment. Also see *Plug and Abandon*.

**Abrasion.** Wearing away, scuffing, scarring, or scratching action on a surface that can lead to premature failure.

**Absolute Pressure (PSIA)** The pressure of surrounding air; also referred to as *ambient air pressure*. The second type of pressure is **Gauge Pressure (PSIG)**. See also *atmospheric pressure*.

**Absorption.** The process of soaking up or holding a liquid, especially water.

**Accumulator** Equipment that stores pressure that can be used to close a blowout preventer on a well in an emergency. Generally, the pressure of nitrogen or hydraulic fluid is used.

**Acetylene** The combustible gas used in an oxygen-acetylene torch.

**Acid Fracturing.** The injection of acid into a limestone formation in an effort to dissolve limestone so that passages are formed through which oil and gas can enter the wellbore. Also referred to as **acidizing**.

**ACT. Automatic Custody Transfer.** See **Lease Automatic Custody Transfer**.

**Additive.** Chemical blended into petroleum products, usually in small amounts, to achieve a specific purpose.

**Adjustable Choke.** A large needle valve used to control the flow of fluids, usually from a flowing well. The needle or dart of the stem may be opened or closed to change the rate of flow.

**Adsorption.** The accumulation of molecules of gas or liquid on a solid surface in a condensed layer.

**Aerobic.** Occurring in the presence of oxygen, as *anaerobic corrosion*.

**Allocation.** The amount of oil and gas that may be produced in a given period of time, usually daily and monthly. Similar in meaning to *allowable*.

**Allowable.** The maximum amount of fluid that the oil regulatory agency allows to be produced in a given period of time, usually expressed as allocation or allowable per day. With stripper wells, the allowable is larger than the well is capable of producing.

**Alloy.** A combination of two or more metals. In a *ferrous alloy*, such as steel, one of the metals must be iron. In a *non-ferrous alloy*, no iron is included.

**Ambient Temperature.** The temperature of the surrounding air.

**Amine.** A glycerin solution used in gas dehydration units.

**Anchor.** A means of fastening guy lines to the ground. Four anchors are used to guy a well servicing rig to stabilize the mast.

**Anaerobic.** With atmospheric oxygen absent.

**Annulus.** The space down hole in a well between the tubing and the casing. This may also be referred to as the *annular space*.

**Anode.** The positive element in a **cathodic protection element** from which electricity flows and corrodes. May also be referred to as a **sacrificial anode**. Used extensively in heater/treaters to protect against corrosion.

**AOSC.** Association of Oil Well Servicing Contractors, located in Dallas, Texas.

**ANSI.** American National Standards Institute.

**Antifreeze.** An ethylene glycol compound mixed with water to prevent engine cooling systems from freezing.

**API,** American Petroleum Institute. Founded in 1920. Sets drilling and production standards.

**API Gravity** See API Gravity Ratings in Appendix A.

**Apron Ring.** The lowest ring of plates on a tank.

**Arc Welding.** Process for joining two pieces of metal by passing an electric arc between them through a rod or continuous wire. The generated heat of the arc melts the rod and metal fusing them together.

**Artificial Lift.** Methods utilized to lift oil to the surface when bottom hole pressure is too low to cause the oil to flow. Lifting methods include 1) mechanical lift (the pumping unit), 2) centrifugal lift, 3) hydraulic lift, and 4) gas lift.

**ASME.** American Society of Mechanical Engineers.

**Associated Gas.** The natural gas cap that overlies and makes contact with crude oil in a reservoir.

**Atmospheric Pressure.** The pressure exerted by the air or atmosphere around us. At sea level, it is approximately 14.7 pounds per square inch but it decreases with increasing altitude. A pressure equal to 14.7 PSI may be referred to as *one atmosphere*. See also *absolute pressure* and *gauge pressure*.

**Atmospheric Vessels.** Vessels that are designed to hold liquids but with a maximum pressure of only a few ounces.

**Atom.** The smallest particle of matter and the basic unit of an element, such as oxygen (O), iron (Fe), etc.

**Back-off.** To unscrew.

**Backpressure.** The pressure caused by a restriction of the full flow of oil or gas.

**Backpressure Valve.** A valve designed to regulate the pressure ahead of it. Backpressure valves are utilized on outlet lines of all pressure vessels.

**Back-up.** A wrench or chain tong utilized on the already tight side when making up connections of pipe.

**Baffles.** Plates that control the flow of fluids inside vessels.

**Ball and Seat.** The main parts of the valves in a plunger-type oil well pump.

**Barrel.** The standard measurement in the U.S. oil industry. One barrel contains 42 gallons of liquid and 5.6146 cubic feet and 0.15898 cubic meters of volume.

**Barrel Wrench.** A friction wrench used in repairing oil well pumps. This special wrench prevents damaging the barrel in disassembly and re-assembly.

**Battery.** Means *group of*. A group of tanks and vessels is a tank battery. A group of wells can be called a well battery, etc.

**Bbl.** Abbreviation for *barrel*.

**BCPD.** Barrels of condensate per day.

**BCPH.** Barrels of condensate per hour.

**BDPD.** Barrels of distillate per day.

**BDPH.** Barrels of distillate per hour.

**Bean.** A positive choke inserted into a line to regulate the flow of fluid from a well. Different sizes of beans are used to produce different flow rates. Beans are generally measured in sixty-fourths of an inch.

**Bell Hole.** A hole dug beneath a pipeline to provide room for tools or repair procedures. The pipeline may be buried or on top of the ground.

**BF.** Barrels of fluid.

**BHP.** Bottom hole pressure.

**Bird Cage or Bird's Nest.** The spreading of the individual wire strands of the end of a wire rope in preparation for running a new *rope socket* made of babbit or lead.

**Black Magic.** An oil-based drilling and workover fluid.

**Blank Flange or Blind Flange.** A solid disk with bolt holes used to dead end a companion flange.

**Bleed-down or Bleed-off.** To reduce pressure by *cracking* or throttling or barely opening a valve to release the pressure slowly.

**Bleeder or Bleeder Valve.** The valve on the pumping tee of a pumping well used to check pump action and to draw samples.

**Blow Down.** The act of removing all pressure from a vessel or line, usually done prior to working on the system.

**Blowout.** An uncontrolled loss of pressure from a system.

**Blowout Preventer.** A special type of valve installed to prevent a blowout on a drilling or workover rig. A smaller version is used under a pumping stuffing box to assist in re-packing the box while under pressure.

**Blg.** Bailing.

**BO.** Barrels of oil.

**Bob Tail.** Any short truck or a truck with the trailer removed.

**Boilerhouse.** The act of guessing at a gauge, pressure reading, etc. instead of observing it. Making up a false report showing work not physically done.

**Boll Weevil.** A term applied to an inexperienced worker.

**Bolster.** A swiveling rack placed on a pipe trailer and a truck bed that can swivel or spin to allow the truck to turn corners without placing the load in a bind.

**Bomb.** Slang term for any tool that is lowered on a wire line to collect information, such as temperature or pressure.

**Bonnet.** The part of a valve that contains the stem packing and the valve stem.

**Boomer,** A load binder used to place tension on a chain to secure or tighten a load to be transported.

**Boot.** A large tubular section of pipe on the side of a wash tank that permits the gas to separate from the liquid before the liquid flows down and into the bottom of the vessel. The boot is usually attached to the outside top edge of a tank, and a flume or conductor normally goes down through the center.

**BOP.** Blowout preventer.

**BOPD.** Barrels of oil per day.

**Bore.** The inside diameter of a casing or an engine cylinder.

**Bottom-Hole Pressure.** The pressure at the bottom of the well in pounds per square inch.

**Bottom Water.** Water in a producing formation that is below the oil and gas in that formation.

**Bowl.** The holding device that the slips fit into when supporting the tubing string in well servicing.

**BPD.** Barrels per day.

**BPH.** Barrels per hour.

**Brass.** An alloy of copper and zinc. The copper is usually 60% or greater.

**Bronze.** An alloy of tin and copper. May also be referred to as *brass*.

**Break Out.** To loosen or screw out a *made up* or tight joint in line pipe, tubing, or sucker rods.

**BS.** Basic sediment. May also refer to BS&W.

**BS&W.** Basic sediment and water.

**Buck Up.** To tighten a thread or connection tight enough that it will not leak under pressure.

**Bull Headed.** Referring to a tee connection in a system where the openings go to the right and the left. Opposite of *running*.

**Bump Down, Bump Bottom, or Tap Bottom.** To have a pump hit bottom on the downstroke because of excess rod length. Often set this way on purpose. Also refers to firmly seating the pump cups after going into the hole with a replacement pump. May also be done to try to stimulate a pump before pulling.

**BW.** Barrels of water (D = day, H = hour, etc.).

**Cage.** The part of the pump that holds the ball and seat to limit ball movement.

**Carbon Dioxide (CO<sub>2</sub>).** A heavy poisonous gas that is injected into oil wells to stimulate enhanced recovery because it combines with and thins crude oil.

**Carbon Monoxide (CO).** A heavy poisonous gas given off as a result of combustion in an engine.

**Cased Hole Completion.** Method of finishing a well such that the casing is run all the way through the pay zone, then cemented, and perforated. This is the most common type of completion.

**Casing.** Heavy steel pipe that lines the hole. The fixed or cemented string in a well.

**Casinghead Gas or Oil Well Gas.** Associated (from above) and dissolved gas produced along with crude oil from the well.

**Casing Pressure.** Gas pressure built up between the casing and the tubing.

**Cast Iron.** Iron made with a small amount of carbon (about 3%). By removing more of the carbon and making the iron flexible, *wrought iron* is produced.

**Cat.** A crawler-type tractor.

**Cathead.** A spool-shaped attachment on a winch to which a rope is attached; utilized for hoisting and pulling loads.

**Cathode.** The metal that does not corrode when corrosion occurs.

**Catline.** A hoisting or pulling line operated from a cathead.

**Cat Walk.** The narrow steel walkway near the top of a tank battery.

**Cat Walk Ladder.** The steps leading up to the cat walk.

**Cellar.** A hole, usually square, dug before drilling a well to allow working space for the casinghead equipment and blowout preventer.

**Centrifugal Lift.** The use of a liquid pump and electric motor located on the bottom of the tubing string with rotating stages (impellers and diffusers) above it to lift the liquid to the surface. Also referred to as **Electrical Submersible Pumping**.

**Centrifuge.** A shake-out or grind-out machine. Samples of oil in test tubes are placed in the machine and rotated at high speed to settle out BS&W.

**CFG.** Cubic feet of gas.

**CFGPD.** Cubic feet of gas per day.

**Chase Threads.** To straighten and clean machined threads.

**Cheater.** A short length of pipe used to increase the handle length and leverage of wrenches.

**Choke.** A restriction through which the well is produced. A short drilled nipple is often referred to as a **Flow Bean** or a **Positive Choke**. An **Adjustable Choke** is a large, heavy duty **Needle Valve** that is measured in sixty-fourths of an inch openings.

**Christmas Tree.** The wellhead on a flowing oil well consisting of a master gate, wing gate, and other fittings associated with the tubing. Casing valves are a part of the wellhead.

**Clean-out Plate, Manhole, or Manway.** Various names given to entry openings into vessels.

**Clip.** A U-bolt or similar device used to fasten two strands of a wire rope or cable together.

**Close Nipple.** A very short nipple having threads over its entire length and even shorter than an all-thread. Cannot be used with fittings that have recessed threads or a stabbing bell.

**CO.** Carbon monoxide.

**Collar or Coupling.** Device threaded on the inside used to connect two threaded joints.

**Come-Along.** A tightening device that crawls along a length of chain. Used for tightening guy lines on a well servicing rig.

**Completion.** The process of placing a drilled oil well into operation. It includes running the final string of casing, cementing it into place, perforating, running tubing, and any special procedure needed to prepare the well for production. May also include acidizing or fracing.

**Computer.** A device capable of storing and supplying information, solving problems, and supplying results from data. Examples are calculators, digital computers, and analog computers.

**Computer Control.** A system where field devices such as switches, valves, gauges, alarms, shut-in devices, etc., are controlled by computerized devices.

**Computer Program.** A procedure or routine for solving problems on a computer.

**Condensate.** A fluid that leaves the formation as a vapor but condenses into a liquid in the tubing or within the surface processing. These liquids can be propane, butane, heavier hydrocarbons used in making gasoline, and may also contain some water. Also called *distillate* or *natural gasoline*. Distillate is highly used by refiners for jet fuel, kerosene, diesel fuel, or heating oil.

**Connate Water.** Water contained within the producing formation when it was deposited.

**Connection.** The joining of two or more fittings. *Making a connection* is a drilling term for adding another joint.

**Connections.** Another term for fittings. See *Fittings*.

**Control Panel.** Part of an electrical control system that controls the functions of the equipment.

**CO<sub>2</sub>.** Carbon dioxide.

**Corrosion.** An eating away by degrees of a material.

**Coupon.** A small metal strip that may be held in a corrosive system to measure the nature and severity of the corrosive action.

**CP.** Casing pressure.

**CPSI.** Casing pressure shut in.

**Crack a Valve.** To open a valve a small amount. Oilfield valves are always opened slowly to prevent downstream damage caused by sudden shock before the control equipment has time to react and normalize.

**Crater.** Slang for equipment failure.

**Crude Oil.** Liquid petroleum as it comes out of the ground. Crude oils range from very light (high in gasolines) to very heavy (high in residual oil). The fluid remains a liquid after pressure is removed.

**Csg.** Casing.

**Cut Oil or Wet Oil.** Oil that contains water.

**Dead Man.** A piece of wood, steel, or concrete that is buried to attach a guy wire for bracing a mast, tower, or piece of equipment. Acts as an anchor.

**Dead Oil.** Oil that no longer contains light ends or gas.

**Dead Well.** A well that will not flow.

**Depletion,** A deduction allowed in computing the taxable income from oil and gas wells.

**Die.** A tool used to make or clean male threads. Opposite of *tap*.

**Dike or Fire Wall or Escarpment.** Earthen mound used to contain sludge from wells during drilling or to contain leaks from tanks or vessels.

**Discovery Well.** A wildcat well that discovers or finds a new reservoir.

**Disposal Well or Injection Well.** A well through which produced water is returned to subsurface formations. A general term that does not indicate if the water is being used for water flood.

**Dissolved Gas.** Natural gas that is in solution with the crude oil in the formation.

**Distillate.** A term highly used by refiners to refer to heavier condensates from gas wells that are called jet fuel, kerosene, diesel fuel, or heating oil. Also used by many in reference to condensate.

**Dog House.** A small building used for keeping lease records, changing clothes, and for general supply storage.

**Dog Leg.** A bend in pipe usually to lift a meter higher for convenience. Can also apply to a ditch or downhole deviation from absolute vertical in a well.

**Dope.** A lubricant used on threads to promote easier and better make-up and to prevent gauling of threads. There are many dope compounds for a variety of purposes.

**Double.** Usually refers to two joints of pipe that are standing in the derrick or two sucker rods hung. This speeds up the process of pulling and running pipe.

**Doughnut.** Slang expression for a tubing hanger or ring of wedges that supports a string of pipe.

**Downcomer.** A pipe through which flow is downward.

**Dozer.** A powered machine for earthwork. Short for bulldozer.

**Dresser Sleeve.** A sleeve slid over the ends of two pieces of pipe to join them together to hold pressure without the need for threads.

**Drifter.** A worker who never stays in one place very long.

**Drip.** Small quantities of liquid that condenses out of natural gas. Very flammable and dangerous to handle.

**Dry or Lean Gas.** Gas that has been produced without liquids or has been through treating equipment to remove all or most liquids.

**Dry Hole.** A well that does not find a commercial volume of oil or gas. Sometimes referred to as a *duster*.

**Dutchman.** A piece of thread that has broken off inside a fitting that must be removed before the fitting can be used again.

**Electrical Submergible Pumping.** Use of a centrifugal pump and electrical motor located at the bottom of the tubing string with rotating stages (impellers and diffusers) above it to lift the liquid to the surface.

**Electrochemical.** Chemical changes associated with the flow of electrical current, as in corrosion.

**Electrolyte.** A mixture of soil or liquids capable of conducting an electrical current.

**Emissions.** Gases discharged as waste material.

**Embrittlement.** The loss of strength in a metal losing caused by its absorption of gasses, such as carbon dioxide or hydrogen sulfide. Stainless steel is used to replace some parts such as bolts and gaskets because it is impervious to embrittlement.

**Emulsion.** The proper name for all of the elements and compounds produced from an oil well usually in a fluid state. After this fluid goes through a separation process, it is then called Natural Gas, Crude Oil, and Produced Water. This water is usually salty.

**Enhanced Recovery.** The process of adding a force and chemical reaction into the reservoir to stimulate production and extend the life of the field and the amount of hydrocarbons produced.

**Et Al.** Abbreviation for *et alii* which is Latin for *and others*. Used on signs where the owners are too numerous to be listed.

**Farm Out.** To share drilling rights on leased acreage.

**Fatigue.** Failure of metal due to repeated loading or stress.

**Female Connection.** A connection with internal threads.

**Fireflooding.** The use of high volumes of air that are pumped underground to drive fire through the formation to aid in production. Also referred to as *in-situ* combustion.

**Fire Wall.** A wall of earth built up around an oil tank or tanks to hold the oil in event of tank failure.

**First Stage or Primary Recovery.** The initial production produced from a well when nothing is added back into the formation to stimulate future production.

**Fittings.** All of the valves, nipples, tees, unions, ells, etc. used to make up a system of piping. Also called *connections*.

**Flange Up.** To complete or finish a job.

**Float.** A long flat-bed trailer used to haul oilfield equipment.

**Flood.** A term used in enhanced recovery to indicate that a force is injected in an injection well, travels across the formation, and is produced back from other wells.

**Flow Line.** The line that goes from the wellhead to the tank battery.

**Flow Splitter** A large horizontal three-stage separator where the gas flows into the gas system and the water, by use of an interface float, is diverted into the water disposal system. The flow of oil by use of diverter weir gates can be diverted to several heater/treaters so that it can be slowed down, heated, and treated prior to flowing to the stock tank.

**Flowing Well.** A well that has enough bottom hole pressure to flow the fluid from the formation, to the surface and through the production facilities all the way to the tank battery.

**Fluid.** Any substance that can easily change its shape to fit a container. This includes natural gas, air, crude oil, water, drilling mud, etc.

**Fluid Level.** Distance from the wellhead to the fluid level in the pipe. Because of the differences in diameter, it will be different in the tubing and in the casing.

**Flume.** A large pipe that extends down into the center of a wash tank that permits the separation of gas and liquid before the liquid flows down and enters the wash tank at the bottom of the vessel. If the flume is mounted externally on the side of the vessel it is called *aboot*.

**Formation.** See *reservoir*.

**Fracturing or Fracing.** Process of opening up the underground formation in the reservoir by pumping in liquids under high pressure to increase the permeability of the formation. Sand may be pumped in as a propping agent or acid to etch the formation to stimulate production.

**Frozen.** Condition of components in which they will not operate freely, if they will move at all. Also a condition of lines where ice has formed on the inside from expanding gas and the moisture has turned to ice.

**Ft.** Feet.

**G.** Gas.

**G&O.** Gas and oil.

**Gal.** Gallon.

**Galvanize.** To coat a metal with zinc to prevent corrosion.

**Gas Lift.** A process of injecting natural gas into the column of fluid in the tubing string to cause the well to flow the production to the tank battery.

**Gas/Oil Ratio.** The amount of gas produced for each barrel of oil.

**Gas Processing Plant.** A plant strategically located in the oilfield to remove hydrocarbon liquids, primarily butane, propane, and heavy gasolines, before the gas is transported by pipeline to market.

**Gas Well.** A well that produces natural gas. Condensate may also be produced and may be as clear as potable water.

**Gage.** Alternate spelling of *gauge*.

**Gauge.** Tool used for measuring daily production.

**Gauge Line.** A tool used to measure the amount of fluid in a vessel.

**Gone to Water.** Term applied to a well in which the water production has dramatically increased and almost no oil is being produced.

**GOR.** Gas/oil ratio.

**Gradient.** Pressure drop.

**Gravity or API gravity.** The API standard for measuring the density of a liquid. A specific gravity of 1.0 is equivalent to 10. Degrees API. See comparison chart located in Appendix A.

$$\text{API gravity} = \frac{141}{\text{specific gravity}} - 131.5$$

**Grease Book.** Slang term for the lease pumper's daily gauge book.

**Gun Barrel.** Popular slang term for a *wash tank*, a large three-stage atmospheric separator utilized to separate crude oil and water. Being large, the fluid goes through it slowly, allowing additional time for separation.

**Guy Wire or Guy Line.** A cable or wire rope used to steady a mast or pole. The load guy line supports the pulling load, and the wind guys protect the mast from winds.

**HCl.** Hydrochloric acid.

**Handy.** A connection or fitting that can be unscrewed by hand.

**Hard Hat.** A plastic hat worn to protect the head from falling objects. Two styles are common. One has a bill in front while the other has a brim all the way around.

**Hatch or Thief Hatch.** An opening in the top of a tank with a hatch that can be opened to gauge or test the condition of the produced oil.

**Headache or Headache Rack.** A steel frame mounted on a gin pole truck at the front of the bed to protect the cab when the poles are folded over and also to support the poles when folded down.

**Heater/Treater.** A large three-stage separator with direct heat. The most common style is about 20 feet tall and 6-8 feet in diameter. Most operators try to heat them only in the winter. Many are pressurized but can be operated with atmospheric pressure.

**Holiday.** A missed or skipped spot when painting or any action where full coverage is important.

**Horizontal Drilling.** A procedure of turning the well hole horizontally and drilling a long distance in the reservoir to increase the well's potential production.

**Hot Oiler.** A truck with a heating unit that can pump oil through it and heat it to melt paraffin and treat oil to clean it enough to be sold.

**Hot Tap.** To tap a new line into an existing one while the line being tapped is under pressure and not shut it down while the new connection is being made.

**H<sub>2</sub>O.** Water.

**H<sub>2</sub>S.** Hydrogen sulfide.

**H<sub>2</sub>SO<sub>4</sub>.** Sulfuric acid.

**HP.** Hydrostatic pressure, also horsepower.

**Hpf.** Holes per foot.

**Hydraulic Lift.** A method of pumping oil or water down a well to operate a reciprocating hydraulic pump to produce the well.

**Hydrocarbons.** Any organic compound made up entirely of hydrogen and carbon. Often called fossil fuels, it is produced as crude oil and natural gas.

**Hydrogen Sulfide (H<sub>2</sub>S).** A deadly gas that occurs naturally in crude oil. Has the odor of rotten eggs and can kill quickly in many situations. Heavier than air and settles.

**Infield Drilling.** Drilling in an area that has near-by production.

**In Situ Combustion.** Burning a portion of a reservoir underground with fire to produce hot gases to drive oil to the producing well.

**Injection Well.** A well used to pump fluids underground. It may be a disposal well in a neutral zone to get rid of produced water or in a producing zone to inject gas for pressure maintenance or water for water flood.

**Insulating Flange or Union.** A flange that contains plastic bolt sleeves, washers, and gasket to insulate the two halves to break the possibility of electrical current flowing through the pipe. Other styles are available. This is done as a form of cathodic protection.

**Ion.** Electrically charged particle, atom, or radical.

**Iron.** A naturally occurring element. After being processed with one or more metals, it is formed into steel.

**Joint Venture.** Arrangement in which two or more parties join together in a petroleum venture.

**Jack or Pipe Jack.** A short slender pipe with short projections to one side and a bottom plate. It is utilized to support a joint of pipe while it is being made up.

**Joint.** One full length of pipe. This is usually twenty five to thirty two feet.

**Junk.** Equipment or materials that have been retired from service. Occasionally a piece of **junk** cannot be re-used but has a high salvage value and is not to be confused with **scrap**, which just has a weight value. Parts from a junked pumping unit may be used to repair several other similar units as the need arises.

**KB** Kelly bushing. Point from which drilling measurements are made when measuring downhole.

**KCl** Potassium chloride. Used in fresh water to prevent formation hydration (swelling) in formations that contain shale. Shale is clay that has been compressed until it becomes rock.

**Kill a Well.** Process in which water or oil is pumped down a well in preparation for working it over or making a change in the hook-up. This procedure is carefully calculated to prevent damaging the formation.

**LACT.** See **Lease Automatic Custody Transfer.**

**Lead Time.** Planning time set aside before a project begins.

**Lean or Dry Gas.** Dry gas from a gas well or gas that has been treated to remove most of the liquids.

**Lease Automatic Custody Transfer or LACT unit.** When oil is sold to a pipeline company, it may go through a LACT unit to measure the number of barrels, and a sampler aids in determining gravity, temperature, and BS&W. After the crude oil goes through the backpressure valve, ownership of the oil is transferred from the production company to the pipeline company.

**Liquid.** State of matter in which a substance fits the shape of its container but its volume remains almost constant and is not greatly influenced by pressure.

**Live Oil.** Crude oil that still contains light ends and natural gas.

**Load Binder.** Chain or cable used to tie down a load of equipment on a float .

**Location.** The site at which a well is to be or already has been drilled. Normal spacing for medium depth wells is one per forty acres or sixteen per section. There will be more shallow wells per square mile and fewer deep wells.

**Loop.** A circle of pipe placed in a line to absorb changes in the length such as contraction in cold weather and expansion in hot weather.

**LPG or Liquefied Petroleum Gas.** Butane, propane, or a mixture of these two fuels.

**Lubricator.** 1. A swab tool holder that is set on top of a well during swabbing. 2. An oiler used to lubricate pistons in a gas compressor or single cylinder horizontal engine.

**Make a Hand.** To be a good, dependable worker.

**Male Connection.** Connection with external threads.

**Manway, Manhole, or Clean-out Plate.** Various names for entry plates into vessels.

**Marginal Well.** An oil or gas well where the production is so limited in relation to production costs that the profit is approaching the vanishing point.

**Master Gate.** A large vertical tubing valve on the Christmas tree that is full opening (tools can be run through it) and can be closed in emergencies. High-pressure gas wells normally have two master gates, one mounted directly on top of the other.

**MCF.** Thousand cubic feet.

**Misc.** Miscellaneous.

**Miscible Flood.** An enhanced oil recovery procedure involving the injection of solvent followed by a displacing fluid, usually water.

**MMCF.** Million cubic feet.

**MCFGPD.** Thousand cubic feet of gas per day.

**MI&RU.** Move in and rig up. A drilling rig and well servicing abbreviation to explain rig expense.

**Multiple Completion.** A method in which the well is completed to provide the capability of producing hydrocarbons from two, three, or even four different zones at the same time.

**NaCl.** Sodium chloride or salt.

**Natural Gas.** Consists largely of the hydrocarbon methane. Occurs naturally in underground reservoirs and is the cleanest burning of all fossil fuels.

**Nipple.** A short piece of threaded pipe. Available in two inch increments up to twelve inches long. May be seamed or seamless, and low, medium, or high pressure.

**Non-associated Gas.** Natural gas that while in the reservoirs does not contain a significant amount of crude oil.

**O.** Oil.

**O&G.** Oil and gas.

**Octane Number.** A rating of a gasoline's ability to burn without abnormal knocking. The octane number is the percentage of isooctane in the fuel blend.

**Off Production.** A term used to describe the condition of a well that has a production problem or is temporarily shut in for many reasons. Opposite of *on production*.

**Offset Well.** Well drilled on the next location near another one.

**Oil.** A compound composed of hydrogen and carbon. See also *crude oil*.

**Oil Well.** A well completed for the purpose of producing hydrocarbons from an underground reservoir.

**Oil Shale.** Shale deposits that contain oil. The United States owns huge oil shale deposits primarily in Colorado, Utah, and Wyoming. The oil is difficult to extract.

**Old Hand.** Someone who is highly experienced at what is being done.

**On the Line.** A term used to describe a stock tank while oil is being sold out of it. It is not uncommon for it to be "on the line" for several days when the gauger does not come every day.

**On the Pump.** A term for a well that has a pumping unit on it.

**OPEC (Organization of Petroleum Exporting Countries).** An association of some the world's largest oil producing and exporting countries.

**Open Hole Completion.** Un-cased portion of the hole. The bottom end of the casing stops just above the oil in the impervious zone and is cemented. The pay zone is then drilled and left as open hole.

**Oxidation.** Condition of a substance combining chemically with oxygen to form an oxide, or electrochemically, as the loss of electrons at the anode of a corrosive cell.

**Parting.** Breaking, such as "the rod string parting" (a rod breaking)

**Pay Zone.** The down hole reservoir from which the oil and/or gas is being produced.

**Permeability.** The ability of the reservoir rock to transmit fluid through the porous spaces. This regulates the ability of fluids to move through the reservoir. The rock is impermeable if there is no communication between pores. Not to be confused with porosity.

**pH.** A symbol used to express the concentration of the hydrogen ion in a solution, such as acidity (0 to 7), or the alkalinity (7 to 14.7). Declining numbers less than 7 indicate increasing acidity, and numbers increasing above 7 indicate increasing alkalinity, with 7 being neutral. pH 6 means a concentration of  $10^{-6}$ , 0.000001 and indicates slight acidity.

**Fig.** A scraping tool run through a line to clean out paraffin or other deposits. A *rabbit* checks the clearance to see if it is still round, although it will also check for obstructions.

**Pipe.** A general term that includes all forms and classes of pipe. It includes line pipe, tubing, and casing.

**Pipeline.** A transportation system for moving oil and gas from the field to a refinery, although it is also a general word used in referring to many other types of line.

**Pipeline Oil.** Oil clean enough to be sold. This is usually no more than one percent BS&W.

**Pit or Slush Pit or Overflow Pit.** An earth pit with dikes around it, usually rectangular or square, with a plastic liner and a net cover.

**Pit.** A depression or the eating away of a metal part caused by corrosion.

**Plug and Abandon.** To stop producing a well, plug the depleted formation, and salvage all pipe, materials, and equipment possible.

**Plug Back.** To shut off the lower formation in a well bore, usually to reduce water production.

**Polarize.** To reduce or retard an electrochemical corrosion reaction by deposition of a corrosion product.

**Polymer.** A compound formed by linking one molecule with another to form a very long chain. A process used extensively in enhanced flood recovery.

**Poor Boy.** Descriptive term for any homemade or shop-made substitute or practice usually done to save money.

**Plunger Lift.** A method of lifting oil to the surface by a plunger and bottom hole gas pressure.

**Porosity.** The percentage that the volume of pore space bears to the total bulk volume. This determines the amount of space available for the storage of fluids.

**Positive Choke.** A choke with a hole drilled through it to flow the produced fluid through. It is not adjustable. To change the flow rate, the positive choke must be replaced.

**Potential Test.** A test to determine the maximum rate at which a well can produce oil. Continuous production at this rate may cause serious problems with the well.

**Power Oil Tank.** A tank added into the tank battery system just ahead of the stock tank to supply oil to be utilized downhole in a hydraulic lift system. In other applications where water is used, this vessel will be located just ahead of the water disposal system to supply water.

**Ppm.** Parts per million.

**Pressure Maintenance.** Injecting gas back into the reservoir to maintain reservoir pressure to push new oil to other wells to be produced.

**Pressure Regulator.** A regulator utilized to control the pressure downstream or after the regulator.

**Pressure Relief Valve.** An automatically opening valve utilized to limit the pressure that can be placed inside a vessel.

**Primary or First Stage Recovery.** The initial production produced from a well where nothing is added back into the formation to stimulate future production.

**Production.** The amount of oil, gas, and water produced, or a company that owns oil and/or gas producing wells and produces oil and/or gas.

**Productivity Test.** Producing a well at several different rates or ways to determine the best method of producing the well.

**Prorationing.** Regulating oil and/or gas production to maximize production

**PSI.** Pounds per square inch.

**PSIA.** Pounds per square inch absolute.

**PSIG.** Pounds per square inch gauge.

**Pump Off.** To pump a well too long or too rapidly so that the liquid level in the well bore or casing is lowered to the level of the standing valve in the pump.

**Put on Pump.** To install a pumping unit, and all necessary equipment to pump a well.

**Qts.** Quarts.

**Rabbit.** A device run through pipe to check if it is still round or partially plugged, such as casing and tubing before it is run in the hole. *Apig* is a line cleaner.

**RB.** Rotary bushing.

**Refining.** The manufacture of petroleum products from crude oil by a series of processes into major finished products as well as supporting a wide petrochemical industry.

**Remote Control.** A control placed in the field to control and regulate operations in the field. May be changed by remote signal from the office.

**Reserves.** Estimate of already located oil and gas still in the formation that may be produced.

**Reservoir.** An underground formation where oil and gas have accumulated.

**Reservoir Pressure.** The pressure on the well after the well has been shut in for twenty-four hours.

**Rich or Wet Gas.** Natural gas that contains liquid hydrocarbons in vapor form as produced from an oil or gas well.

**Riser.** A pipe through which fluid moves upward when moving through it.

**Rock a Well.** To alternately remove pressure off the casing and tubing of a well to stimulate it to flow again by itself. The alternate procedure might be to call *aswabbing unit*.

**Rod Job.** Process of pulling and running rods.

**Rod.** A general term for rods used to pump an oil well, including steel and fiberglass.

**Round Trip.** Act of pulling and running rods or tubing.

**Running.** Making up a tee in a system where one opening points to a side and the other continues straight ahead.

**S.** An abbreviation used on fittings to indicate approval for use with steam.

**Sand Fracture.** The injection of oil and sand or water and sand into the well under high pressure to open up the formation to allow the well to produce more hydrocarbons. It may also be used in injection wells in order to increase the injection rate or lower the injection pressure.

**Sanded Up.** Condition in which sand has accumulated in the casing of a producing well causing the tubing or pump to stick in the hole. Sand enters with the produced emulsion but falls to the bottom.

**Scrap.** Material retired from service that has a weight-only value. Not to be confused with *junk*, which may have a high salvage value.

**Scraper.** A device run in a well on a wire line to check the hole clearance prior to running a packer. It is also the name for a tool used to remove scale or salt bridging.

**SD.** Shut down.

**SDR.** Shut down for repairs.

**Seamless.** A term describing pipe made with an extrusion process where the pipe is not welded. Pipe is sold as seamed or seamless. Cheaper pipe is rolled round and parent material welded.

**Secondary Recovery** or **Second Stage Recovery.** Production in which force is added to the formation. Water flood and pressure maintenance are classified as second stage recovery.

**Scale.** A deposit on a metal. Scale is usually deposited out of water. Often referred to as *gyp*.

**Seismic Exploration.** Method of prospecting for oil and gas by sending shock or other waves down into the earth. A geophone captures these reflections and computers aid in analysis.

**Separator.** A pressurized vessel whose purpose is to separate gas from liquids at the tank battery.

**Separator, Two Stage.** A separator designed to divide the incoming emulsion. The gas will go out the top, while the oil and water is still combined and the liquid is dumped through a float controlled valve to the next vessel in the system.

**Separator, Three Stage.** A separator designed to separate the emulsion into gas out the top, water into a line off the bottom, and the oil leaving the vessel through the oil line.

**Shake-Out.** A centrifuge that rotates at high speed to settle BS&W to the bottom of the test tube.

**Sharpshooter.** A long, narrow shovel.

**Sheave.** A grooved pulley. May have one to eight or more grooves and belts.

**Shut In.** A well that can produce oil, but the valves are closed. May be shut in for many reasons.

**Shut in Pressure.** Pressure taken after well has been shut in for twenty-four hours to reach maximum.

**SI.** Shut in.

**SIBHP.** Shut in for bottom hole pressure test.

**SICP.** Shut in casing pressure.

**SITP.** Shut in tubing pressure.

**SIP.** Shut in pressure.

**Slack Off.** To lower a load or ease up on the tension on a line.

**Sling.** A wire rope loop used to lift heavy loads.

**Slips.** Wedge-shaped toothed pieces of metal that fit inside a bowl and are used to support drill pipe, tubing, or fished broken sucker rods.

**Slop Tank.** A vessel installed to hold very difficult-to-treat oil for a longer period of time while the majority of the oil is being sold. Careful utilization of a slop tank can dramatically reduce treating costs without slowing down sales or risk filling the tank battery with oil that cannot be sold.

**Slush Pit, or Pit, or Overflow Pit** See *pit*.

**Snatch Block.** A sheave or pulley where one side can be opened up so a wire line can be inserted.

**Soft Rope.** A three- or four-foot piece of large rope cut off. The small strands are unwound individually and utilized to tie many things. These individual strands are called soft rope.

**Sour and Sweet Crude Oil.** Sour crudes usually have more than one percent sulfur and sweet crudes has less. The sweeter crudes are more valuable.

**Sour Gas.** Gas that contains impurities such as sulfur or hydrogen sulfide.

**SPE.** Society of Petroleum Engineers.

**Skimmer Tank.** A tank designed to allow water to flow through it but to skim off any oil that enters to be retained and added back into the produced oil. Works very similarly to the gun barrel or wash tank except it is utilized to reclaim very small amounts of oil that would otherwise be lost into the water disposal system.

**Spacing.** Refers to the number of acres designated for each oil well, such as twenty-acre spacing.

**Spaghetti.** A very small tubing string.

**Spalling.** Condition in which metal breaks up, chips, or flakes away.

**Specific Gravity.** See API reference chart in Appendix A.

**Stabilized.** Condition in which a well is considered has produced long enough that it continues to produce the same amount in a given period of time, usually one day.

**Steel.** A metal alloy of two or more metals, one of which must be iron

**Storage Tank.** Any tank capable of holding liquids. The word *storage* is not specific and can be used in reference to oil, water, or workover mud.

**Strike Plate.** An extra plate of metal attached to the bottom of a tank under the thief hatch to prevent damage to the bottom tank plate caused by the plumb bob on the end of a gauger's gauge line.

**Strip a Well or Stripping Job.** Pulling the rods and tubing at the same time.

**Stripper Well.** A well that *strips* the remaining oil from a reservoir. Efficient operations and conservative lease pumping practices can keep thousands of low-volume wells in profitable operation. These wells contribute a large percentage of U.S. crude production.

**Strap a Tank.** To measure a tank for the purpose of making a chart that shows the tank volume every quarter of an inch. This is usually done by the oil purchaser.

**Submersible Pumping.** Procedure in which a pump is installed below the liquid level in a well. The electric motor is on bottom and rotates fluid cups above it to lift the liquid. This manual refers to this type of pumping as *centrifugal lift*.

**Swab.** To drop a swabbing tool down the tubing and pull a column of oil to the surface.

**Swamper.** A helper on a truck.

**Swb.** Swabbed.

**Sweet Crude.** Oil that contains no sour impurities.

T/ Top

**Tail Chain.** 1. A chain put on the end of a rope on a drilling rig used to spin pipe. 2. A chain put on gin poles at the back of the truck and tightened so that the poles cannot fold over on the headache post.

**Tailboard.** The back edge of the bed of a bob tail truck. It may be rolling (free to roll while winching) or welded solid.

**Tail out Rods.** To pull the bottom of a rod out or tail them out when laying them down on a rack, or tail them back in when running rods that have been laid down.

**Take a Strain On.** To lift a heavy or awkward load on a wire line gently.

**Tally.** The act of measuring pipe, usually in increments of one hundredth of a foot.

**Tank.** A vessel designed to hold liquid. May be rectangular or round, horizontal or vertical.

**Tank Battery.** A series of vessels and connecting lines designed to separate oil, water, and gas, and flow it into the correct vessel or line destination. A tank battery usually has tanks, but in high volume, clean oil may not use any vessels.

**Tanker.** An ocean-going ship designed to haul crude oil in bulk from a producing area to a refinery.

**Tap.** 1. To strike lightly. 2. A tool used to cut or clean female threads. Opposite of *die*.

**Tap Bottom or Bump Bottom.** To allow the pump to hit bottom with each stroke of the pumping unit. Often done deliberately on shallow wells or when trying to stimulate a well that has stopped producing oil before pulling.

**Tar Sand.** Rock impregnated with tar or heavy crude that cannot be recovered by ordinary production methods.

**Tbg.** Tubing.

**Telecommunications.** The transmission of signals over long distances, such as radio.

**Telemetry.** Use of radio or other methods to transmit field measurements over a distance.

**Tertiary or Third Stage Recovery.** Final oil recovery requiring two or more forces such as temperature and pressure, or chemical and pressure.

**Thief.** A tool utilized to secure liquid samples from the top, center, or the bottom of a tank.

**Thief Hatch.** An opening on the top of a tank with a hatch that can be opened to gauge or test the condition of the produced oil.

**Third Stage Recovery, or Tertiary Recovery.** Final oil recovery requiring two or more forces such as temperature and pressure, or chemical and pressure.

**Thread Protector.** A steel or plastic cover to screw on threads while the pipe is in storage.

**Tie Down.** Secure a load to be hauled prior to moving the vehicle.

**Tong.** A form-fitting wrench used to back up, or make up pipe. Form fitting to prevent egging or crushing the pipe. Used on the rig floor and in pipe laying tools.

**TP.** Test Pressure.

**Trip.** The action of pulling or running rods or tubing. Pulling and running is called *around trip*.

**Triple.** Refers to three joints of pipe stood up in the derrick or three rods hung up together. This speeds up the process of pulling and running rods and pipe.

**Tubing.** Random length upset pipe that is moveable in a well. Fluids are produced through it and it can be pulled when working the well over.

**Tubing Job.** The pulling and running of tubing.

**Unitize.** To produce from a reservoir so that one company operates every well in a pay zone although it does not own all of them. The income is prorated according to percentage of units owned.

**Vacuum Truck.** A truck with a low-pressure pump that operates with a large diaphragm and a reciprocating motion. Can pump thick emulsified oil containing scale and small solid objects.

**Vapor.** A gas that can be compressed into a liquid.

**Viscosity.** The thickness of an oil and the rate that it will pour.

**Warm Up or Heat Up a Connection.** To apply slight heat or pressure, such as a hammer blow, to a connection that is difficult to loosen.

**Wash Tank or Gun Barrel.** A large three-stage atmospheric separator utilized to separate crude oil and water. Because the tank is large, the fluid goes through it slowly to give it additional time to separate.

**Water Disposal Tank.** A tank in a battery to receive any produced water.

**Waterflood.** Process of injecting water into an injection well and recovering it from another well.

**Water Leg.** A line coming off the tank near the bottom of a vessel that regulates how much oil is retained in the gun barrel or heater/treater.

**Well.** A general term for all petroleum producing wells, but can also include water and injection wells.

**Wet or Rich Gas.** Natural gas just as it was produced from an oil or gas well, which contains wet hydrocarbon vapors.

**Widow Maker.** Any condition or act that is liable to cause death or serious injury to a worker.

**Wicker.** A broken strand of wire on a wire rope. Often common on winch lines.

**Wildcat.** An exploratory well drilled in an area where no previous production is present. Usually five miles or more from producing wells.

**Winch or Gin-Pole Truck.** A bob tail truck with a winch. Medium size winch trucks may have two winches, and a large one may even have three.

**Wiper.** A rubber ring or device for wiping rods and tubing clean on the outside while pulling.

**Wireline.** A small diameter wire line used to lower a wide assortment of downhole tools into a well for performing many functions, such as surveys. A general term for downhole lines.

**Wire Rope.** A steel cable composed of steel wires wrapped around a central core to create a line of great strength and flexibility.

**Wing Gate.** The horizontal gate valve on a Christmas tree. The well is usually controlled from this valve, and the master gate is available upon need.

**WOC.** Waiting on cement, a drilling term used for the time spent waiting for cement to set or get hard before resuming the drilling or completion operations.

**WOG.** Water, oil, gas. (Stamped on some fittings)

**Working Pressure.** The pressure at which a piece of equipment is designed to work.

**Work Over.** To solve a downhole problem on a well that is more difficult than basic well servicing.

**Wtr.** Water.

**WSP.** Working steam pressure. (Stamped on some fittings).

**Yield Point.** The maximum stretch or pull that can be placed on metal and still have it return to its original shape. Used extensively in well servicing, especially when pulling rods.

**Zone.** The downhole area that the well is being produced from. Referred to as *pay zone*.



## INDEX

### Instructions for Using Index.

#### CHAPTERS.

The beginning number refers to the chapter. The letter that follows identifies the section. The number after the dash refers to the page within that section on which the information begins. For example, an entry of 3C-2 indicates that the topic begins on Chapter 3, Section C, Page 2. The information may be continued on following pages.

#### APPENDIXES.

If the topic location begins with a letter, then the reference is located in an appendix. The letter represents the appendix and the number tells the page within that appendix on which the topic discussion begins. For example, A-9 indicates that the information is located in Appendix A, and is found on page 9.

Air compressors, 11C-2 to 11C-3  
 Air packs, 3B-4 to 3B-6  
 Alcohol, use of, 1A-4  
 Allowables, 5A-1 to 5A-2  
 Alternate day gauging, 12B-5  
 Analyzing daily production, 12C-1 to 12C-5  
 Antifreeze, engines, 11B-5  
 Atmospheric vessels, 10C-1 to 10C-7  
 BLM (Bureau of Land Management), 1B-7  
 Basic sediment & water (BS&W), 10A-3  
 Beam gas compressors, 15B-3  
 Belts, V-Belt, B-16 to B-19  
 Carbon dioxide flood, 15D-2  
 Casing, 4B-3 to 4B-5, 4C-1, D-3  
   perforations, 4C-1, 17C-1  
 Cathodic protection, 16B-2, 16B-4  
 Centrifugal lift (See also Electrical Submersible Lift), 7A-1 to 7B-2  
 Chemicals,  
   batch treatment of oil, 13C-4  
   expense, 1B-5  
   injection, 13C-1 to 13C-5  
   treating oil, 13C-1 to 13C-5  
   purpose of chemicals, 13C-1  
 Chemical pumps, description, E-1 to E-5  
 Christmas tree,  
   gas wells, 18A-1 to 18A-3  
 Circulating pumps, (See Tank Battery), 10F-5  
 Communications, 1B-1 to 1B-3, 2A-2 to 2A-3

Company policies, 1A-2 to 1A-6  
Condensate, 18A-1  
Contact towers, 18C-2  
Commingling different pay zones, 12D-3 to 12D-5  
Corrosion, 16A-1 to 16B-4  
    at the tank battery, 16B-4 to 16B-5  
    downhole, 16B-3  
    protection, 16B-1 to 16B-5  
Daily gauge book (grease book), 19A-4  
Daily well tests, 14B-2 to 14B-6  
Dead weight tester, 14D-2  
Diesel engines, 11B-5  
Distillate, 18A-1  
Drilling, an overview, 4A-1 to 4A-5, 4B-1 to 4B-8  
    cased and open hole completions, 4C-1  
    downhole measurements, 4B-2  
    drilling problems and rods, 4B-6 to 4B-8  
    drillstem tests and drilling breaks, 4B-5  
    horizontal, 15D-2  
    intermediate and tapered strings, 4B-5  
    new wells, 4B-1  
    perforation and completion, 4C-1 to 4C-4  
    records, 19B-1  
    surface string of casing, 4B-4  
    the oil string, 4B-5  
Drilling personnel, 4B-1 to 4B-2  
Drugs, use of, 1A-4,  
Drum measurements, A-6  
Electrical submersible pumps, 7A-1 to 7B-2  
    installation, 7A-3  
    operation, 7B-1 to 7B-2  
Electrochemical corrosion, 16A-3  
Electrical  
    motors, 11A-4  
    peak load requirements, 11A-5  
Electricity, 11A-1 to 11-5  
    AC and DC, 11A-5  
    control boxes, 11A-2 to 11A-3  
    lease electrical system, 11A-1 to 11A-2  
    cycles and volts, worldwide, 11A-5  
    safety, 11A-4  
Emergency communications, 2B-1  
Emergency telephone numbers, 2B-2  
Employee,

honesty, 1A-4  
 benefits, 1A-2 to 1A-5  
 Engines, 11B-1, to 11B-6  
   antifreeze, 11B-4  
   gas logs and scrubbers, 11B-5  
   oils and gasoline, 11B-3 to 11B-4  
   two and four cycles, 11B-1  
 Enhanced recovery, 15A-1 to 15D-4  
 Eye wash stations, 3A-6  
 First stage recovery, 15A-1 to 15A-5  
 Flora and fauna (plants and animals), 2C-4  
 Firearms, carrying them to work, 1C-5  
 Flood, 15C-1  
 Flow lines, 10A-6, 10B-1 to 10B-2  
 Flowing wells, 5A-1 to 5A-8  
   testing, 14A-1  
   variable and positive chokes, 5A-5 to 5A-7  
   wellheads, 5A-2 to 5A-4  
 Fracing and acidizing wells, 17E-4  
 Fresh air packs, 3B-4 to 3B-6  
 Gas injection, 15C-3 to 15C-4  
 Gas lift, 9A-1 to 9C-2  
   conventional mandrels, 9B-1 to 9B-3  
   continuous and intermittent flow, 9C-1 to 9C-2  
   introduction, 9A-1  
   kickover pulling tool, A-5  
   kickover running tool diagrams, A-4  
   side pocket mandrels, 9C-1 to 9C-2  
   system, 9A-3 to 9A-4  
 Gas, natural,  
   compression, 18D-1  
   dehydration units, 18C-1  
   pipelines, 18D-2  
   treating, 18D-2  
   wells, (See also Gas wells), 18A-1 to 18A-3  
   well safety valves, 18A-3  
 Gas/oil ratio test, 14B-5  
 Gas well separators,  
   3 stage horizontal, 18-B-1  
   3 stage vertical, 18B-2 to 18B-3  
 Gas wells, 18A-1 to 18A-3  
   condensate, 18A-1  
   distillate, 18A-1  
   drip pots, 18D-3

- logs and scrubbers, engine, 11B-5
- safety valves, 18A-2 to 18a-3
- testing, 18D-2
  - wellheads, 18A-1 to 10A-3
- Gas well tank batteries, 18C-4
- Gauge line, 12B-2 to 12B-3
- Gauger communications, 13D-2
  - note jar, 13D-2
- Gauges and gauge calibration, 14D1 to 14D-3
  - dead weight tester, 14D-2
- Gauging daily production, 12B-4
- Glycol pumps, 18C-2
- Government agencies, 1B-7
- Grease book (daily gauge book), 19A-2
- Gun barrel, 10C-4
- H<sub>2</sub>S (See Hydrogen sulfide)
- Heater/treater, 10B-7 to 10B-9
  - pressure control valves, 10B-8 to 10B-9
- Holddowns, 6D-3, 17C-4
- Horizontal drilling, 15D-2
- Hydraulic lift, 8A-1 to 8C-3
  - central power, 8C-1 to 8C-3
  - designing system, 8A-2
  - free pump, 8A-3
  - jet pump, 8A-3 to 8A-4
  - one well system, 8B-1 to 8B-2
- Hydrogen sulfide, 3B-1 to 3B-4
- Individual well tester, 12D-1
- Insert oil pumps, downhole, 6D-3
- Kelly bushing measurement, 4B-3
- Kimray valves, 10B-8 to 10B-9
- Kolor Kut, 12B-3
- LACT unit, selling oil, 13D-4
- Landowner relations, 2C-1
- Lease
  - driving to, 2A-1
  - principal meridian, 2A-3
- Lease,
  - offices, 2C-8
  - operating expense, 1B-5
  - vehicle, 2A-1 to 2A-3
  - supply expense, 1B-5
  - chemical expense, 1B-5
- Lease maintenance, 2C-4 to 2C-8

- cattleguards, 2C-5
- fences, 2C-5
- lease pumper maintenance duties, 12E-1 to 12E-3
- maintenance, 2C-4 to 2C-8
- pits, 2D-7
- roads, 2A-2
- signs, 3A-3 to 3A-5
- vista and trash accumulation, 2C-6
- Lease pumper
  - alcohol, use of, 1A-4
  - carrying firearms to work, 1A-5
  - carrying unauthorized persons in the vehicle, 2A-2
  - day on the lease, 12A-1 to 12A-4
  - dressed for work, 1B-1 to 1B-2
  - drugs, use of, 1A-4
  - good lease pumper, 12A-1
  - job duties, 1A-1
  - lunch time, 1A-2
  - maintenance duties, 12E-1 to 12E-3
  - planning activities, 12A-2 to 12A-4
  - safety equipment, personal, 1B-1 to 1B-2, 3A5-5 to 3A-6
  - schedule of activities, 12A-2 to 12A-4
  - taking unnecessary chances, 3A-2
  - work hours and responsibility, 1A-1 to 1A-2, 2A-3
  - working for more than one operator, 12D-5
- Livestock injuries, 2C-2 to 2C-3
- Lubricators, polished rod, 6C-4
- Materials transfers, 19C-4 to 19C-5
- Mechanical lift (See also Pumping units)
  - overview, 6A-1 to 6A-4
  - how pumping units operate, 6A-2 to 6A-4
  - pump cycles, 6B-2
  - wellheads, 6C-1 to 6C-6
- Mineral rights, 2C-1
- Miscible flood, 15D-1 to 15D-2
- Natural gas (See Gas, natural)
- Not enough production, 12C-1 to 12C-4
- Oil
  - API gravity, 13A-4 to 13A-5
  - batch chemical treatment, 13C-4
  - hot oiler, 13C-4
  - methods of treating, 13B-1 to 13B-4, 13C1 to 13C-6
  - selling, 13D-1 to 13D-6
  - testing, 13A-1 to 13A-4

- treating, 13A-1 to 13A-2
- Oil sales system, 10G-1 to 10G-4
- Oil storage (See also Tank batteries)
  - temporary storage tanks, 10A-1 to 10A-6
- Oil well, an overview, 4A-1 to 4A-3, 4B-1 to 4B-5
  - casing or well heads, 4B-3 to 4B-5
  - hot oiler, 13C-4
  - production curves, 10A-2
  - production from well, 10A-4
  - production records, 19C1 to 19C-6
  - treating chemicals, 13C-1
  - tubing string, 4C-2 to 4C-4
- OSHA (Occupational Safety and Health Act), 1B-7
- Oxygen corrosion, 16A-3
- Packers, 4B-3, 5A-4, 17C-4
- Perforations, raising, lowering, and orientation, 15B-4
- Pickup,
  - driving habits, 2A-1
  - expense, 2A-1
  - personal use, 2A-1
  - when the vehicle has problems, 2B-1
  - tools, 1B-4
- Pipe storage, 19D-2 to 19D-4
  - sizes, D-2
  - upset tubing sizes, D-2
- Plunger lift, 5B-1 to 5B-6
  - wellhead arrangements, 5B-2 to 5B-6
- Pony rods (See Rods)
- Potential well tests, 14B-2
- Pressure maintenance, 15B-3
- Pressure surveys, well, 14C-1
- Primary recovery, 15B-1 to 15B-5
- Principal meridian, 2A-3
- Productivity testing, 14B-3 to 14b-4
- PSIA and PSIG, 11C-2
- Pulling units (See Well servicing units)
- Pup joints (See Tubing)
- Pumper, contract services, 1A-3
- Pumping units (See also Mechanical lift)
  - belts and sheaves, B-16 to B-20
  - changing adjustments, B-11 to B-15
  - electric and natural gas prime movers, 6B-1
  - historical development, B-1
  - maintenance and servicing, 6B-3 to 6B-6

- setting and assembly, B-6 to B-10
- sizes and styles, B-1 to B-5
- wellheads, 6C-1 to 6C-2
- Pumps, downhole oil, 6D-1 to 6D-5
  - abbreviations, A-1
  - API sizes, A-2
  - designations, A-1
  - downhole pump problems, 17B-8
- Pumping wells, testing, 14A-4
- Records, 19A-1 to 19D-7
  - drilling, pipe, and servicing, 19B-1 to 19B-4
  - lease records book, 19A-1 to 19A-2
  - materials transfers, 19D-1 to 19D-6
  - production, 19C-1 to 19C-6
- Recordkeeping, 19A-1 to 19D-7
  - forms, A-8 to A-13
- Reservoirs, 4A-1 to 4A-3
  - drive mechanisms, 14B-1 to 14B-2
- Roads, lease, 2A-2
  - cattleguards, 2C-5
  - maintenance, 2C-4
  - off road travel, 2C-2
- Rod rotators, 6C-4
- Rods, 17B-1 to 17B-8
  - API ratings, 17B-1
  - downgrading rods, 17B-1 to 17B-2
  - fiberglass rods, 17B-7
  - fishing, 17B-6
  - fishing tools chart, A-15
  - pulling and running rods, 17B-3 to 17B-4
  - running the rods in the hole, 17B-5 to 17B-6
  - straight and tapered strings, 17B-2
  - tally sheets, 17B-5
- Run tickets, 13D-3
- Safety,
  - around poisonous gas, 3B-2 to 3B-3
  - equipment, wearing, 3B-4
  - eye wash stations, 3A-6
  - spark-proof tools, 3A-6
  - work habits, 3A-3
- Safety valves,
  - gas wells, 18A-3 to 18A-3
- Sand lines, 17D-3
- Satellite tank batteries, 12D-1 to 12D-2

Scale, 16A-3 to 16A-4  
Secondary recovery, 15C-1 to 15C-4  
Selling crude oil. 13D-1 to 13D-6  
    gauger communications, 13D-2  
    LACT unit, 13D-4 to 13D-5  
    rejection notice, 13D-2  
    run tickets, 13D-3  
    tank seals, 13D-3  
Separators,  
    gas wells, 18D-1 to 18D-2  
    pressure control valves, 10B5 to 10B-10  
    two stage, 10B-5 to 10B-7  
Sheaves, B-18 to B-19  
Signs, lease, 3A-3 to 3A-5  
Slop tank, 13C-5  
Sour corrosion, 16A-1 to 16A-2  
Spark-proof tools, 3A-6  
Steam flood, 15D-3 to 15D-4  
Stock tank, 10C-5 to 10C-7  
Storage, materials, 19D-1 to 19D-6  
Sucker rods (See Rods)  
Sweet corrosion, 16A-1 to 16A-2  
Tally sheets,  
    rods, 17B-5  
    tubing, 17C-4  
Tank batteries, 10A-1 to 10A-7  
    alternate day gauging, 12B-5  
    analyzing daily production, 12C-1 to 12C-5  
    atmospheric vessels, 10C-1 to 10C-9  
    chemical injection, 10D-3  
    circulation lines, 10F-1 to 10F-7  
    circulating pump, 10F-5  
    clean tank bottoms, 12A-3  
    commingling different pay zones, 12D-3 to 12D-6  
    construction review, 10H-1 to 10H-3  
    dike, 10C-8  
    emulsion line systems, 10D-2 to 10D-3  
    equalizer line system, 10E-4  
    gas system, high and low pressure, 10C-1 to 10C-2  
    gas wells, 18C-3 to 18C-4  
    gauging daily production, 12B-1 to 12b-5  
    gun barrel, 10C-4 to 10C-5  
    LACT unit, selling oil, 13D-4  
    lease pumper maintenance duties, 12E-1 to 12E-3

location oil storage, 10A-1 to 10A-2  
 not enough production, 12C-1 to 12C-3  
 oil sales system, 10G-1 to 10G-4  
 pits, 10C-7  
 satellite tank batteries, 12D-1 to 12D-2  
 selling oil, 13D-1 to 13D-6  
 slop tank, 13C-5  
 stock tank, 10C-5 to 10C-7  
 tank charts, 10A-3  
 testing wells, battery preparation, 14A-2 to 14A-3  
 treating oil, 13A-1 to 13A-5, 13B-1 to 13B-4, 13C-1 to 13C-6  
 thieving and testing oil, 12B-3  
 too much production, 12C-4 to 12C-6  
 vessels, and chart, 10A-5  
 water disposal tanks, 10F-4 to 10F-7  
 Telephone numbers, 2B-1 to 2B-2  
 Temperature surveys, 14C-1  
 Tertiary recovery, 15D-1 to 15D-4  
 Testing wells (See also Well testing), 14A-1 to 14C-3  
 Thief and thieving oil, 12B-3  
 Third stage recovery, 15D-1 to 15D-4  
 Too much production, 12C-4 to 12C-6  
 Tools, 1B-4 to 1B-5  
 Treating crude oil, 13A-1 to 13A-5, 13B-1 to 13B-4, 13C-1 to 13C-6  
   batch treatment, 13C-4  
   hot oiler, 13C-4  
 Tubing, 17C-1 to 17C-6  
   diameter and linear measurements, 17C-2 to 17C-3  
   hydrotesting, 17C-5 to 17C-6  
   packers, holddowns, and safety joints, 17C-4  
   perforations, 17C-1  
   problems and solutions, 17C-4 to 17C-5  
   pulling and running tubing, 17C-3  
   safety joints, 17C-4  
   selection of quality, 17C-2  
   tally sheets, 17C-4  
   threads, 17C-2  
 Unitizing a reservoir, 12D-3 to 12D-4  
 Vacuum, 11C-3  
 Vehicle,  
   driving habits, 2A-1  
   expense, 2A-1  
   personal use, 2A-1  
   when the vehicle has problems, 2B-1

- tools, 1B-4
- Vessels, tank battery,
  - atmospheric, 10C-1 to 10C-8
  - pressurized, 10B-2 to 10B-11
- Water disposal tanks, 10F-4
- Water flood, 15C-1 to 15C-3
- Well heads
  - gas wells, 18A-1 to 18A-3
  - pumping wellheads, 6C-1 to 6C-6
- Well servicing (See also Rods. See also Tubing), 17A-1 through 17E-4
  - double pole units, 17A-1
  - downhole pump problems, 17B-8
  - mast style units, 17A-2
  - moving and setting up, 17A-2 to 17A-
  - single and double drum units, 17A-2
  - single pole units, 17A-1
  - swabbing, 17D-3
- Well servicing records, 17A-3 to 17A-4
- Well testing, 14A-1 to 14C-3
  - basic tests, 14A-3 to 14A-4
  - bucket and barrel tests, 14B-6
  - daily well tests, 14B-2 to 14B-3
  - gas / oil ratio, 14B-5
  - normalizing, 14A-2
  - pressure surveys, 14C-1
  - productivity well tests, 14B-3
  - potential tests, 14B-2
  - preparing tank battery, 14A-2 to 14A-3
  - temperature surveys, 14C-1
- Well workover, 17E-1 to 17E-4
  - fracing and acidizing wells, 17E-4
- Wire lines, 17D-1 to 17D-5
- Working for more than one operator, 12D-5

**The Lease Pumper's Handbook  
Being Written For  
Commission On Marginally Producing Oil and Gas Wells  
State Of Oklahoma**

**ACKNOWLEDGMENTS**

**PERMISSION TO INCLUDE ILLUSTRATIONS OR PICTURES OF EQUIPMENT.  
List of companies who have written and extended permission for illustrations and pictures  
to be included in this basic manual where appropriate.**

<b>Commission on Marginally Producing Oil &amp; Gas Wells, State Of Oklahoma</b>	Geophysical Research Corp GRC
Use of Oklahoma Emblem in Publication	Harbison Fischer
	HASCO Mfg. Inc.
	Helicoid Instruments
ABB Vetco Gray	ITT Barton
Anchor Systems. Inc.	Kimray
Arrow Specialty Co.	Kudo Industries
Azure Environmental Ltd.	Lact Service
Baker SPD	Lufkin
Balon ***	Marathon Oil Co. Safety, Iraan Tx
Bestolife	Master Pumps and Equipment
Bettis	McKay Equipment Company
CAC Onix	McLean Plunger Lift
Camco	McMurry Macco
Continental Emsco Co.	Mine Safety Equipment. MSA
Cooper Cameron Valves	Monotech Systems
-WKM, Orbit, Thornhill	Murphy, F. W.
Craver, Foster	Natco, National Tank Co.
CSP Poly Pipe	Nordstrom Valves, Inc.
Dandy Specialties, Inc.	Norris Dover
Daniel Instrument and Control	Oil Country
D - Jax	Oil States
DHI Downhole Injection tools	Oilfield Improvements
Downing Wellhead Equipment	Permian Production Equipment, Inc,
Echometer	Pipeline Pigging Products
Fiber Composite Company	Production Control Services
Fiberflex	REDA
Fisher Controls	Reed Fiberglass
Four J Plunger	Regal
The Foxboro Co.	Sivalls Tanks
Gates RubberCo	Star Fiberglass Systems
Gearench	Tank Safety Gauge
General Electric Industrial Systems	Tank Bottom Saver

Victaulic of America  
Vinson Fisher  
Walker, W.L.  
Williams/Bethlehem