

## GLOSSARY OF TECHNICAL TERMS

- Amphibolite:** A crystalloblastic (metamorphically recrystallized) rock consisting mainly of amphibole and plagioclase.
- Anaerobic:** Living or active in the absence of free oxygen.
- Anhydrite:** A mineral; anhydrous calcium sulfate,  $\text{CaSO}_4$ .
- Annular Space:** The space between casing and the wellbore or between two strings of casing.
- Anorthosite:** A plutonic rock (formed at great depth) composed almost wholly of plagioclase.
- Anticline:** A fold with strata sloping downward on both sides from a common crest.
- API:** American Petroleum Institute.
- API Number:** A number referencing system designed by the American Petroleum Institute to identify wells in which each state and county has a number code.
- Aquifer:** A zone of permeable, water saturated rock material below the surface of the earth capable of producing significant quantities of water.
- Attenuation:** The act of lessening the amount, force, magnitude, or value of.
- Baker Tanks:** Portable skid-mounted storage tanks for temporary usage at a wellsite.
- Bank Run Gravel:** Gravel found in natural deposits with varying mixtures of sand, silt and clay.
- Barrel:** 42 U.S. gallons.
- Base Gas:** ("Cushion Gas") needed to help produce the "working gas" rapidly. Includes injected gas plus native gas and is normally held permanently within a gas storage reservoir.
- BBL:** Barrel.
- BCF:** Billion cubic feet.
- Benching:** Method of quarrying by alternating vertical and horizontal excavations yielding a step (stair) profile.
- Benthonic:** 1. The bottom of a standing body of water.  
2. Or pertaining to sea-floor types of life.
- Bentonite:** A natural clay, used as cement or mud additive for its expansive characteristics and/or its tendency not to separate from water.
- Bloolie Line:** Pipe that diverts fluids from the wellbore to a reserve pit.

Blowout: Uncontrolled flow of gas and/or oil from a well.

BOD: Biochemical Oxygen Demand.

BOP: Blow Out Preventer.

Brachiopod: Any of the phylum of marine, shelled animals with two unequal shells (Brachiopoda).

Bridge Plug: A type of mechanical packer that is usually permanent which is used in a well casing to isolate a zone.

Brine: A solution containing appreciable amounts of NaCl and/or other salts. Synonymous with salt water.

Brine Disposal Well: A well (Class IID) for subsurface injection of associated produced brines from oil, gas and underground gas storage operations, or a well (Class V) for disposal of spent brine from geothermal and solution mining operations.

Brush Bridge Plug: An obstruction placed in a well at a specified depth. It can be the stump of a tree, brush, sacks, rags or any other material used as the foundation for a plug isolating a zone in the wellbore or casing.

Bryozoa: Any of the phylum of aquatic invertebrate animals (Bryozoa).

BTX: Benzene, Toluene, and Xylene. Aromatic hydrocarbons.

Buffer Zone: An area designed to protect and separate.

Cable Tool: Equipment for cable-tool drilling consisting of a heavy metal bar sharpened to a chisel-like point and attached to 1 to 2 inch diameter cable. The gravity impact of the heavy metal bar (bit) pulverizes the rock which is removed with a bailer.

Caliper Log: A log that is used to check for any wellbore irregularities. Run prior to primary cementing as a means of calculating the amount of cement needed. Also run in conjunction with other open-hole logs for log corrections.

Cambrian Period: Time period ranging from 580 - 520 million years ago.

Carbonate: Containing the  $(CO_3)^{+2}$  radical.

Carcinogen: Cancer causing substance.

Casing: Metal pipe used to line a wellbore and give the borehole stability.

Casinghead: Top of surface casing above the ground to which control valves and flow pipes are attached.

**Casing Shoe:** Reinforcing collar screwed onto the bottom of surface casing that guides the casing through the hole while absorbing the brunt of the shock.

**Cation:** A positively charged ion.

**Caustic:** A material that eats away (corrodes) by chemical action, high alkalinity. A base with a very high pH.

**CEA:** Critical Environmental Area.

**Cement Bond Log:** A log used to evaluate the effectiveness of a primary cement job based on the different responses of sound waves in metal pipe and cement. It can also be used to locate channels in the cement.

**Cement Retainer:** An expandable plug (packer) run on tubing or casing that allows cement to be pumped below.

**Centipoise:** A unit of viscosity equal to one hundredth of a dyne-second per square centimeter.

**Circulation:** The round trip made by the well fluids from the surface down the tubing, wellbore or casing and back to the surface.

**Clastic:** Consisting of fragments of rocks or of organic structures that have been transported from their places of origin.

**Coagulate:** To cause or become thickened or clotted.

**Completion:** Preparation of a well for production after it has been drilled.

**Condensate:** Liquid hydrocarbons recovered by conventional surface separators from natural gas. Condensate has an API gravity of 50° to 120°.

**Conductor Pipe or Casing:** Large diameter casing that is set or driven into the unconsolidated material above bedrock to keep this material from caving in. Usually it is relatively short in length.

**Conglomeritic:** Rock containing amounts of gravel, pebbles or cobbles.

**Connate Water:** Water trapped in the pore space of sedimentary rocks at the time the rock was deposited.

**Correlative Rights:** Rights of any mineral owner to recover resources that underlay their property.

**Cumulative Impact:** Two or more individual effects on the environment which, when taken together, may compound or increase the other's environmental impact.

**Cushion Gas:** ("Base Gas") includes injected gas plus native gas and is normally held permanently in a gas storage reservoir.

Cuttings or Samples: Chips of rock cut by the drill bit and brought to the surface by the drilling fluid. They indicate to the wellsite workers what kind of rocks are being penetrated and can also indicate the presence of oil or gas.

CZM: Coastal Zone Management.

Darcy: A unit of permeability equal to one cubic centimeter of fluid of one centipoise viscosity flowing in one second under a pressure differential of one atmosphere through a porous medium having a cross section of one square centimeter and a length of one centimeter.

Decollement: Detachment structure caused by the differential response of unique rock types to deformation.

Deliverability: Volume per unit of time that can be delivered.

Detritus: Fine particulate organic debris.

Devonian Period: Period of time ranging from 415 - 360 million years ago.

Dip: Angle of inclination from the horizontal.

Dipper: A localized, somewhat archaic term for person who salvages floating oil from surface waters.

Disconformity: 1. A surface of erosion between parallel strata.  
2. Contact between discordant structures (e.g., a dike).

DMN: Division of Mineral Resources, New York State Department of Environmental Conservation.

DMR: Division of Marine Resources, New York State Department of Environmental Conservation.

DOH: New York State Department of Health.

Dolostone: A sedimentary rock composed of fragmental, concretionary, or precipitated dolomite [ $\text{CaMg}(\text{CO}_3)_2$ ].

Dome: A roughly symmetrical upward convex fold.

DRA: Division of Regulatory Affairs, New York State Department of Environmental Conservation.

Drag Fold: 1. Minor folding of strata along the walls of a fault in which the "drag" of displacement has produced flexures in the beds on either side.  
2. Minor folds that form in an incompetent bed when the more competent beds on either side move in such a way as to subject it to a couple.

**Drilling Fluid:** Mud, water, or air pumped down the drill string which is used to carry cuttings from the bottom of the hole and acts as a lubricant for the bit. It is also used for pressure control when drilling in high pressure formations and helps maintain the wellbore.

**Drive Pipe:** Conductor casing which is driven into the ground.

**Dry Hole:** A well in which oil or gas is not encountered in sufficient quantities to be commercial and warrant completion to production.

**EAF:** Environmental Assessment Form.

**Ecosystem:** The system composed of interacting organisms and their environments.

**Effective Porosity:** Property of rock or soil containing intercommunicating pore space, expressed as a percent volume of total bulk volume.

**Eminent Domain:** A right of government to take private property for public use.

**Evaporite:** Sediment deposited from ancient seas as a result of extensive or total evaporation.

**Fault:** A fracture or fracture zone along which there has been displacement of the sides relative to each other.

**Field:** The area encompassing a group of producing oil and/or gas wells.

**Filter Cloth:** Material used to underlay fill and other material which allows water to pass through it, but not sediment, thus preventing settling and unwanted siltation.

**Flowback:** Return of fluids, used in the stimulation process, to the surface.

**Flowmeter:** An instrument that measures fluid flow rates.

**Flue Gas:** An exhaust gas (e.g., from an air compressor).

**Fluid Saturation:** Percent volume of effective porosity occupied by a fluid.

**Fold:** A bend in strata or any planar structure.

**Footwall:** The mass of rock beneath a fault plane.

**Fossils:** The remains or traces of plants or animals which have been preserved by natural causes.

**Fracing (pronounced "fracking"):** Injection of fluids under high pressure in order to induce fractures in the producing formation, thereby increasing permeability.

**Fry:** Recently hatched fish.

Gamma Ray Log: Log that records natural gamma radiation of the formations. Shales can be identified because of their high natural gamma radiation content.

Gas Cap Drive: Type of primary reservoir energy where free, compressed gas exists above an accumulation of saturated oil and exerts pressure on the oil causing it to move toward the wellbore.

Gas Saturation: Percent of effective porosity occupied by gas.

Geothermal Gradient: The rate at which the earth's temperature increases with depth. The general average is 1°F/100'.

Geothermal Well: A well drilled to explore for or produce natural heat found in underground hydrothermal, geopressured, or hot dry rock reservoirs.

Gravity Drive: Type of primary reservoir energy where the force of gravity is sufficient to cause the oil and gas to flow to the wellbore.

Graywacke: A coarse sandstone or fine-grained conglomerate, usually dark gray, composed of subangular to rounded fragments of quartz, feldspars, etc.

Grenville Province: The eastern margin of the vast Canadian Shield. It includes the Precambrian rocks exposed in the Adirondack Mountains.

Grout: A concrete mixture that can be placed into a well annulus from the surface. Also a verb.

Hanging Wall: Mass of rock above a fault plane.

Hardpan: A hard impervious layer of soil composed chiefly of clay cemented by relatively insoluble materials.

Hydrocarbon: A compound containing arrangements of only two elements, hydrogen and carbon.

Hydrogen Sulfide: (H<sub>2</sub>S) A malodorous, extremely toxic gas with the characteristic odor of rotten eggs.

Hypalon: Commercial name for a synthetic plastic-like material used to line pits.

Idle Well: A well which is unplugged and that has been inactive longer than two years.

Igneous Rocks: Formed by solidification from a molten or partially molten state.

Inert Gas: Group of gases that exhibit great stability and extremely low reaction rates.

Intermediate Casing or String: Casing set below the surface casing in deep holes where added support or control of the wellbore is needed.

Interstitial: Relating to, or situated in, the interstices, spaces or cracks between things.

Kill Fluid: Heavy fluid used to control well pressure.

Landlocked: Enclosed or nearly enclosed by land.

Lanyards: Broadly; a chord or line to hold something.

Lease Gas: Gaseous hydrocarbons produced at the well or on the lease.

Lifelines: Broadly; a line to which a person may cling, attach, or use to save or protect their life.

Limestone: A bedded sedimentary deposit consisting chiefly of calcium carbonate [CaCo<sub>3</sub>].

Lingula: An ancient genus of brachiopods (shelled marine animals).

Lithologic: Refers to sediments or rocks. The physical character of a rock, generally determined megascopically (by the human eye).

Log: A graphic display of a certain rock properties or certain geophysical characteristics of rock as a function of depth.

Lost Circulation Material: Material put into fluids to block off the permeability of a lost circulation zone.

Lost Circulation Zone: Rock formation that is so permeable or soluble that it diverts the flow of fluids from the well.

LPG: Liquified Petroleum Gas.

LWRP: Local Waterfront Revitalization Program.

Macaroni String: Small diameter tubing used for cleaning out or cementing into confined spaces such as the well tubing or annulus.

Marine: Of, belonging to, or caused by the sea.

Marker Bed: A bed which is distinctive and traceable in outcrop or which accounts for a characteristic signature on a geophysical log or seismic time-distance curve.

Mast: 1. A simple derrick made of timbers or pipe held upright by guy wires.  
2. A sturdy A-frame used for drilling shallow wells or for workovers.

MCF: Thousand cubic feet.

Metamorphism: Chemical and/or physical change in a rock as a result of heat and/or pressure.

**Mineral Rights:** The ownership of the minerals under a given surface, with the right to enter and remove them. It may be separated from the surface ownership.

**MMCF:** Million cubic feet.

**Mousehole:** A short hole drilled to the side of a wellbore to hold the next joint of drill pipe.

**Mudboils:** Silty mounds formed under certain geologic conditions as groundwater erupts at the surface.

**Mudlogging (Unit):** Trailer located at the wellsite housing equipment and personnel to progressively analyze wellbore cuttings washed up from the borehole.

**Native Gas:** Gas originally in place in an underground formation.

**NGPA:** Natural Gas Policy Act.

**Noise Log:** A log that picks up sound vibrations in the wellbore caused by flowing liquid or gas. Used to determine fluid entry points or flow behind casing.

**Nonwetting Phase:** The pore space fluid which has the greatest mobility.

**Oil Wet:** The condition in the pore space of the rock where oil coats the grains of the rock and is the more immobile phase.

**Operator:** Any person or organization in charge of the development of a lease or operation of a producing well.

**OPRHP:** Office of Parks, Recreation and Historic Preservation.

**Ordovician:** Period of geologic time ranging from 520 - 465 million years ago.

**Overburden:**

1. Material of any nature that overlies a deposit of useful materials.
2. Cumulative weight of the rock above some subsurface depth.

**Paleozoic Era:** A period of time ranging from 570 - 225 million of years ago, the beginning of which is marked by the appearance of abundant fossils.

**Pathogens:** A specific causitive agent (as a virus or bacterium).

**Pay:** Zone of oil or gas in commercial quantities.

**Pennsylvanian:** Period of time ranging from 310 to 280 million years ago.

**Percolation Test:** Test to determine at what rate fluids will pass through soil.

Perforate: To make holes through the casing to allow the oil or gas to flow into the well or to squeeze cement behind the casing.

Permeable: Having pores or openings that allow liquids to pass through.

Petroleum: In the broadest sense the term embraces the full spectrum of hydrocarbons (gaseous, liquid, and solid).

Plat: A map of land plots.

Plugging: To place cement and other fluids in a well at appropriate intervals in order to prevent migration of fluids from or within the well.

Pluton: A body of igneous rock that has formed beneath the surface of the earth.

Pneumatic: Run by or using compressed air.

Polymer: Chemical compound of unusually high molecular weight composed of numerous repeated, linked molecular units.

Pool: 1. An underground reservoir or trap containing oil.  
2. A single separate reservoir with its own pressure system.

Porosity: Volume of pore space expressed as a percent of the total bulk volume of the rock.

Potable: Suitable for drinking.

Precambrian Era: A period of time ranging from 4,500 - 570 million years ago.

Primary Production: Production of a reservoir by natural energy in the reservoir.

Primary Reservoir Energy: The naturally occurring condition or mechanism which exists in a reservoir that aids the migrations of fluids to the wellbore.

Production Casing: Casing set through the producing zone of the well.

PSC: Public Service Commission.

PSI: Pounds per square inch.

Pump and Plug Method: A technique for placing cement plugs at appropriate intervals.

PVC: Polyvinylchloride; a durable petroleum derived plastic.

Quartz: A mineral,  $\text{SiO}_2$ .

Radioactive Tracer Surveys (RATS): A survey in which a radioactive isotope is released in a well and followed with a detector which is used to detect fluid movement and rate. It can also be used to recognize channels behind casing, tubing or casing leaks, and determine the flow direction of injected fluids.

Rat-hole: A short slanted hole drilled near the wellbore to hold the kelly joint when not in use.

Real Property: Includes mineral claims and water rights.

Reeving: Hoisting from the derrick floor to the crown block.

Reservoir Rock: 1. Permeable formations in which hydrocarbons have accumulated.  
2. "Reservoir" means any underground reservoir, natural or artificial cavern or geologic dome, sand or stratigraphic trap, whether or not previously occupied by or containing oil or gas.

Reworked: Sediment that has been moved after preliminary deposition, commonly resulting in transportation and sorting.

Riprap: Erosion control device. Heavy irregular rocks or concrete used to form a wall or foundation that must resist the forces of waves, tides, or strong currents.

Rollovers: Convex upward folds on the hanging wall of a thrust fault.

Rotary Rig: A derrick equipped with rotary equipment where a well is drilled using rotational movement.

Royalties: The landowners share of the value of oil and gas produced.

Sacrificial Anode: Cathodic protection provided by galvanic coupling of an anode (a substance which easily loses electrons or corrodes) to a well casing, tank or pipeline needing protection. The sacrificial anode is consumed during protection of the steel object.

Sandstone: A various colored sedimentary rock composed chiefly of sandlike quartz grains cemented by lime, silica or other materials.

Schist Arenite: Metamorphosed graywacke.

Scolithus: Trace fossil, vertical tube left by a burrowing organism.

Secondary Recovery: The extraction of oil from a field beyond what can be recovered by normal methods of flowing or pumping.

Secondary Silica Cement: Silica ( $\text{SiO}_2$ ) precipitated in the pore space of a rock after deposition.

**Sedimentary:** Rocks formed from sediment transported from their source and deposited in water.

**Seep:** Natural leakage of gas or oil at the earth's surface.

**Seismic:** Related to earth vibrations produced naturally or artificially.

**Separator:** Tank used to physically separate the oil, gas, and water produced simultaneously from a well.

**Sequestering Agent:** Chemical additives that reduce chemical reaction between injected fluids and formation fluids.

**SEQRA:** State Environmental Quality Review Act.

**Setback:** Minimum distance required between a well operation and other zones, boundaries, or objects such as highways, wetlands, streams, or houses.

**Shale:** Laminated sedimentary rock in which the constituent particles are predominantly of clay size.

**Short Ton:** 20 short hundred weight, 2,000 pounds.

**Shut In:** (verb) To close the valves at the wellhead to keep the well from flowing or to stop producing a well.

**Shut-In:** (adjective) The state of a well which has been shut-in.

**Significant Habitats:** Areas which provide some of the key factor(s) required for survival, variety or abundance of wildlife, and/or for human recreation associated with such wildlife.

**Siliceous:** Of, relating to, or derived from silica.

**Sill:** 1. A submerged horizontal ridge embedded in stream bottom usually at relatively shallow depth.  
2. An intruded body of igneous rock that is parallel to bedding.

**Siltation:** The build-up of silt in a stream or lake as a result of activity that disturbs the streambed, bank, or surrounding soil.

**Siltstone:** Sediment in which the constituent particles are predominantly silt size.

**Silurian Period:** Period of time ranging from 405 - 415 million years ago.

**Show:** Small quantity of oil or gas, not enough for commercial production.

**Sliding Scale:** A flexible scale that can be adjusted to variables (e.g., income, time).

**Sloughing:** Cave-in of soil or soft rock such as shales from the side of the wellbore.

**Solution Gas Drive:** Type of primary reservoir energy where the major mechanism of energy is a result of gas coming out of solution with decreased reservoir pressure.

**Source Bed:** Rocks in which oil or gas are generated.

**Spacing:** Distance separating wells in a field to optimize recovery of oil and gas.

**SPDES:** State Pollutant Discharge Elimination System.

**Spinner Survey:** Generic name for logs that use spinner type velocimeters to monitor fluid velocities. Used to identify leaks in casing or tubing, analyze stimulation results, and establish injection or production profiles and flow rates.

**Spring:** A place where groundwater naturally flows from a rock or soil onto land or into a body of surface water.

**Spudding:** The initial stage of drilling a well.

**Squeeze:** Technique where cement is forced into the annular space between casing and the wellbore.

**Step Out and Infill Drilling:** To move the minimum spacing unit outside or inside an existing area.

**Step-Rate Pressure Test:** Pressure test where a succession of equal pressure steps (usually increasing) are sustained for a constant time duration.

**Stimulation:** Act of increasing a zone's permeability by increasing the porosity and permeability or inducing fractures.

**Strand Plain:** The shoreline, a beach.

**Stratigraphic Trap:** Accumulation of hydrocarbons entrapped as a result of variation in rock type, usually caused by a change in the environment of deposition.

**Stratigraphic Test Well:** A hole drilled to gather engineering, geologic or hydrological information including but not limited to lithology, structural, porosity, permeability and geophysical data.

**Strippers:** Stripper wells are oil wells producing less than 10 (BOPD) barrels of oil per day.

**Stromatolite:** Laminated calcareous rocks formed from fossil algae.

**Structural Trap:** Accumulation of hydrocarbons entrapped as a result of faulting or folding.

**Surface Casing:** Casing extending from the surface to below the deepest fresh water aquifer. It is inside the conductor pipe and also acts as an anchor for well control equipment.

Surface Rights: Ownership of the surface of land only.

Surfactants: Chemical additives that reduce surface tension; or a surface active substance. Detergent is a surfactant.

Swab: To clean out the borehole of a well with a special tool on a wireline which evacuates fluids and reduces the hydrostatic head to encourage flow.

Synclorium: A broad regional syncline on which minor folds are superimposed.

Taconic Orogeny: Mountain building episode in the latter part of the Ordovician Period, named for Taconic Range of eastern, New York.

Tag: To check the presence and location of something, usually in reference to cement plugs.

Tank Battery: A group of tanks used for storage of oil and other produced fluids from a well or wells.

TDS: Total Dissolved Solids.

Thrust Fault: A low angle reverse fault; the hanging wall moves up in relation to the foot wall.

Tight Formation: Formation with very low permeabilities.

Tile Drainage: Man-made drainage system utilizing open-ended ceramic pipes in areas of poor drainage.

Trap: 1. A body of porous and permeable, hydrocarbon bearing rock which is sealed by impervious rock.  
2. A geologic structure which retards the free migration of hydrocarbons.

Turbidity: Amount of suspended solids in a liquid.

Unit Operation: Joint operation of separately owned producing leases in a field, pool or reservoir.

Viscosity: A measure of the degree to which a fluid resists flow under an applied force.

Water Drive: Type of primary reservoir energy where the energy is provided by the influx of water from the sides, edge, or below the oil accumulation.

Watershed: Drainage area of a stream, lake, or aquifer.

Water-wet: The condition in the pore space of a rock where water coats the grains of the rock and is the more immobile phase.

Weathered: Endured the action of the atmosphere.

Wildcat: Well drilled in area where oil and gas has not yet been found.

WOC Time: "Waiting on cement" time. Allowing cement to harden or set.

Working Gas: In regard to underground gas storage, gas recovered from storage for sale to customers.

Workover: Repair operations on a producing well to restore or increase production.

WRCRA: Waterfront Revitalization and Coastal Resources Act.