IHS U.S. Data Companion

Includes background information and key terms and definitions found in IHS Energy Products and Services

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Information contained in this publication has been compiled from various IHS sources. This publication is intended to provide the reader with background information regarding IHS U.S. Energy products and services.

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Introduction

The energy division of IHS is the energy industry’s leading and most trusted source for well and production information.

Energy’s database contains information for nearly 3 million U.S. wells, providing current, historical and production data for nearly every well drilled, including Seneca Oil’s 1 Drake well, completed in August, 1859:

Information is obtained from and verified through various industry sources including, but not limited to, regulatory agencies, operators and drilling rig companies.

Well records can contain as many as 1000 different data elements and narratives that must conform to specific standards established by our customers.

As data is gathered from different sources, it is reviewed and checked for consistency, accuracy and completeness by our highly experienced staff. Next the data is entered into the IHS database. All IHS products and services utilize the information in the database, providing our customers the most accurate and timely information that is available.

The purpose of this reference is to provide an overview on many of the steps IHS undertakes to provide the most complete and accurate oil and gas information available.
This reference covers:

- The data accumulation process
- Processing gathered data
- Product and application overview
- Key terms and definitions

**Well Data Accumulation**

In general, well information is gathered from several sources, including government agencies (state/federal), operators, drilling contractors and customers.

Our network of regional scouts follows virtually every aspect of a well’s history, from the permit stage through the completion stages. Utilizing their experience and long standing relationships within the industry, IHS scouts often obtain more timely, accurate and detailed information than what is required by many regulatory agencies.

Well permits (permits to drill or intents to drill) obtained from different regulatory agencies are immediately reviewed. Location information is verified and monitored for any changes or updates that may occur.

A scout will obtain and add information such as a contractor name or rig number and report a “pre-spud” status such as “waiting on rotary tools” or “building location”.

When drilling begins on a well, the spud date, drill bit information, mud data, borehole size and/or deviation along with the casing program is added as the information is released. Well test information such as cores, drillstem tests and wireline tests is reported. A dated drilling narrative is also kept and added to the well record.

Once a well reaches total depth, well log information as well as production casing or liner information is added. If a well is a dry hole, plugging details are reported.

Completion data is gathered, including perforation records, formation treatments, flowing and shut in pressure test data and initial potential tests.

Gathering data does not stop when a well has been completed. Data accumulation is an ongoing process.
Information not previously released by an operator, may be added to a well record. As new information is filed with the appropriate regulatory agencies, IHS obtains and validates this new information against existing historical records. All records are researched for possible data inconsistencies that need to be reconciled.

Because reporting requirements may vary between different regulatory agencies, IHS standardizes many names and industry codes to provide consistency for our customers.

*IHS data is customer driven.* Customers continually provide valuable feedback or have questions regarding current and historical data records. Regular customer advisory meetings are held and frequent customer audits are performed.

IHS provides a full time Customer Care staff that provides assistance to customers with questions on data and/or application issues.

**Well Data Integration**

Historical well data records are a compilation, resulting from the historical merger between Petroleum Information (PI) and Dwights Energydata.

Petroleum Information’s well completion database contained over 2.8 million records while Dwights Energydata’s database contained over 1.3 million records. PI’s historical database, dating back to 1928, was used as the “base” file, with additional or missing information being added from Dwight’s files. No decisions were made regarding which file had the “right” data.

The first step in the well file integration process was to compare wells and data in both files. New data fields were defined and added.

Duplicate and non-duplicate records were identified. Well information found in the Dwights database, but not found in the PI database, was verified and added.

The integration of the databases provided an unmatched source of historical well data.
Continual research and review of the information in the database is an ongoing process. This will ensure that IHS customers will have access to the most complete and accurate historical information available.

**Production Data**

IHS provides detailed production information for 98 percent of all U.S. producing entities. This includes information for more than 2 million properties and entities and includes production test data, monthly production volumes and oil, gas and water cumulative production.

There are more than 4 million unique test records available that include initial potential tests and production capacity tests.

**Production Data Integration**

As with well data records, historical production databases from Petroleum Information (PI) and Dwights Energydata were integrated in order to provide the largest and most comprehensive production database available.

Over 145 combined years of production volumes and millions of production data items have been researched and analyzed by our highly experienced and knowledgeable staff of Data Analysts.

The first phase of the integration process was to create a “base” or master file for each state.

Base files were created utilizing customer feedback, industry preferences and select key data elements such as the number of years of monthly production, cumulative production, reporting levels (well vs lease) and select data items important to each state.

The next phase involved replacing former PI Entity ID numbers and Dwights RCI codes with a common PI/Dwights PLUS Production ID number.

The third phase involved merging data from a “non-base” file into a “base file” on a state-by-state basis. This can include, but is not limited to adding extra months of production, adding new or additional well tests and adding previously missing API numbers.

The last integration phase is ongoing. This involves locating, researching and correcting production data inconsistencies between the old PI and Dwights databases.
Processing Gathered Data

As indicated earlier, our customers have established standards for data timeliness, accuracy and completeness.

Regional scouts make every attempt to verify gathered information before it is entered into the database. This allows our customers to retrieve up-to-date and accurate drilling activity through several of our online and daily reports.

Highly experienced data analysts continually review and verify data and research any data inconsistencies that are discovered and/or reported by customers.

Because of the ever increasing complexity of information being reported and disseminated, IHS identified the need to incorporate and develop new database technologies.

To streamline data processing and retrieval and to accommodate the integration of the PI and Dwights historical databases, a data model was created. Utilizing a data model improves the storage, processing and retrieval functions of multiple databases.

The IHS data model is a relational model, based on the Public Petroleum Data Model (PPDM), a vendor-independent, non-proprietary data model that was designed specifically for the oil and gas industry.

This relational data model maps out specific tables in which data is placed and stored. To a degree, data accuracy is handled through a series of “triggers” and “edits”. Each table has a trigger that fires each time a record is added or updated. The trigger activates an edit, or a database code object which is responsible for verifying the accuracy of the record in question.

While accumulating oil and gas data for over 75 years. IHS has combined a staff of highly experienced Data Analysts and a unique system of data integrity checks to insure that its customers receive timely accurate information.
US Products and Applications

IHS provides an extensive array of data and information services, including innovative software solutions; various online applications and editorial services; energy strategies and insight from IHS CERA; energy related company and transaction research from IHS Herold; Coal information and insight from IHS McCloskey and renewable energy information from IHS Emerging Energy Research.

IHS data and information services utilize the most comprehensive well and production database available. IHS provides a vast array of data access tools, such as Enerdeq, U.S. Data Online, and Lognet, in which data can be located, retrieved and output in various formats.

The retrieved data can be saved for future reference or exported into various IHS analytical tools such as PowerTools, Petra and Kingdom. These tools can be used to analyze and manipulate data in order to simulate various scenarios.

As with the data access tools, the analytical tools will provide several output options in which to present the analyzed data.

IHS also provides instant online access to the latest oil and gas news; recent alternative energy and coal activity news; information regarding new regulatory activity and energy related legislation overviews.

You are highly encouraged to visit the IHS website at www.ihs.com/ for more information or contact your local sales office.
297 **Well Data Export format** – A revised version of the old PI 97 and 197 Legacy Well Data export formats. This format was updated to expand the date fields to be year 2000 compliant, to reorganize the location records and to add several new data items. Background information and examples of this format can be obtained from the IHS website.

298 **Production Data Export format** – A revised version of the old PI 98 Legacy Production Export format. This export format was updated in order to expand date fields to be year 2000 compliant, to reorganize the location records and to add several new data items. Background information and examples of this format can be obtained from the IHS website.

% **Basic Sediment & Water** - The percent of basic sediment and water (solid impurities and salt water) found in oil produced during a test.

**A**

**AAPG** – Abbreviation for American Association of Petroleum Geologists.

**AAPG Basin Code** – A code representing a province or basin in which geologic features, stratigraphy and structure are similar.

**Abandonment Date** – The date that operations on a well/entity have ceased and in most cases, the well was plugged.

**Abandonment Pressure** – In PowerTools, this is the shut-in bottom hole pressure that corresponds to a well’s economic limit. It is used to calculate the remaining recoverable gas reserves for volumetric and pressure/cum gas calculations.

**Abandoned Location Date** – The date at which a proposed well site is abandoned by an operator, with no drilling activity having taken place.

**Abstract** – Original title information held by the Texas General Land Office on lands granted and transferred within the state of Texas.

**Abstract Number** – A number that is assigned by the Texas General Land Office to an abstract of an original title of lands granted or transferred within the state of Texas. Assigned numbers are unique to each specific county.

**Acre Feet** – Measured unit of volume based on one acre of producing formation one foot thick.

**Active Well** – For well data, an active well is a well that has not been completed yet. For production data, this describes a well that has either been tested or shown to be producing during the current calendar year. If a record is being updated during the first quarter of a year, IHS will review production activity for the last quarter of the previous year.

**Activity Code** – A letter representing the last reported activity or status for a well.

A = PERMIT - Well has been permitted but not spud.

B = DRILLING IN PROGRESS Well has been spud and is in the process of being drilled.
C = COMPLETED WELL - Well has been completed, but not all the data has been received and processed.

D = COMPLETED WELLS / WHCS - All required data has been received and processed, and the well has been transferred into the IHS historical file.

E = ABANDONED LOCATION – A proposed well site is that is abandoned by an operator, with no drilling having taken place.

Activity Data – In Enerdeq, this is a data type that will let you query well and map data from the most recent year of activity and the past two years for Permit data.

Actual Bottom Hole Location – The measured location of the endpoint of a well from a specific reference point.

Additive – Additives such as clay stabilizers and scale inhibitors can be used in drilling mud as well as in fluids used during completion operations such as formation acidizing and fracturing.

Additive Type – Abbreviations used to describe different types of additives used in drilling mud and completion fluids include:

- ACHL = ALCOHOL
- ACID = ACID
- ACIN = ACID INHIBITORS
- ACRT = ACID RETARDERS
- BIOC = BIOCIDES
- BRKR = BREAKERS
- CACL = CALCIUM CHLORIDE
- CLYS = CLAY STABILIZERS
- CO2 = CARBON DIOXIDE
- CRIN = CORROSION INHIBITORS
- DFOM = DEFOAMERS
- DISP = DISPERSION
- DIVA = DIVERTING AGENT
- EMUL = EMULSIFIERS
- FECL = IRON CONTROL
- FINS = FINES SUSPENDER
- FLA = FLUID LOSS AGENT
- FRDC = FRICTION REDUCERS
- GELA = GELLING AGENTS
- GELO = OIL GELLING AGENT
- GLST = GEL STABILIZER
Ad Valorem Tax - A local tax that is based on the value of oil and gas revenues from a lease.

AFIT – Abbreviation for After Federal Income Tax.

Allowable Production – The monthly oil, gas or lease production that is permitted under the proration orders of a regulatory agency.

Allocation - When there are multiple wells within a lease, allocation is that portion of a lease’s production that is attributed to a given well.

Amount of Propping Agent – The numeric value of the weight of the propping agent that is used in during a well fracturing operation. This number will display in tons if over 999,999 lbs.

Amount Transported – The reported amount of gas, oil or water sold or moved from a production point.

Annual Value – Any given value that is reported for a 12 month period.

AOI – Area of Interest. In IHS Enerdeq, the AOI feature lets you keep track of activity in an area of interest utilizing information from a saved query or map file. You can be notified via email of any changes that occur to the criteria in a selected file(s).

API – The abbreviation for the American Petroleum Institute.
API Number - A unique number assigned to a well by a regulatory agency. This number identifies the location and activity of a well: Digits 1 and 2 = state; digits 3 through 5 = county or pseudo county; digits 6 through 10 = a unique identification number; digits 11 and 12 = sidetracks; digits 13 and 14 = the event sequence code (for recompletions).

Area – A geographical area.

Area Name - A name assigned to a geographical area by an appropriate regulatory agency.

ASCII Data File - **American Standard Code for Information Interchange** data files are frequently stored in binary or ASCII file formats. ASCII file formats can usually be inspected and/or modified utilizing an appropriate text or word-processing program.

AT-TD – A database status code that is assigned to a well when it reaches total depth.

Attribute List – A data query feature in IHS Enerdeq that provides a list of general data categories to choose from.

Average Injection Rate – The average rate at which treatment fluid is pumped into a formation during a fracture job. Units are noted in bbls (barrels) per minute or MCF (thousand cubic feet) per minute.

Azimuth – The angular distance between a fixed point and the direction of an object.

Barrel – A liquid measurement in the energy industry that is equivalent to 42 U.S. gallons measured at 60° Fahrenheit.

Base Depth Value – Measured depth from the surface to the base of an interval.

Base Pressure - Base pressures are used in volumetrics calculations in PowerTools. A base pressure of 14.65 is used for calculations in most states. Individual State Base pressures are used for calculations in the states of AR, CA, CO, IL, KS, LA, MI, MS, NM, OK, TX, UT, WV, WY as well as in Gulf Federal and Pacific Federal waters.

Basin – A province or large area that contains similar types of geologic features.

Basin Name – The name that is given to a province or large area that contains similar geologic features.

BFIT – Abbreviation for Before Federal Income Tax.

BHP/Z – The calculated value for the bottomhole pressure, divided by the gas compressibility (Z) factor. Bottomhole pressures are obtained from the best available source, and can be either calculated or measured.

BHT – see bottomhole temperature.

Bit Size – The size of the drilling bit being used to drill a well.

Bit Type – The type of drilling bit used to drill a well. Different types of bits may be used to drill through different formations.

Block – A legally surveyed offshore area in which a company or group of companies obtain licensing rights to search for, drill and produce oil and gas.
**Block Fraction** - Number identifying a fractional portion of a block.

**Block or League Indicator** – A code identifying a Texas block (B) or league (L).

**Block Name** – The name of a surveyed block assigned by the responsible regulatory agency.

**Block Number** - A number is assigned by a regulatory agency such as the Bureau of Ocean Management, Regulation and Enforcement (formerly the Minerals Management Service) when defining an offshore surveyed area.

**Block Prefix** – In Texas and Louisiana state waters, the letter “A” may precede a block record.

**Block Suffix** – A code found in Texas records that identifies a small (S) or large (L) block, or an abstract (A).

**BOE** – Abbreviation for Barrels of Oil Equivalent. This is a commercial unit of volume used to measure petroleum. One BOE is equivalent to 5.800 million Btu (British Thermal Units) or 6 MCF (thousand cubic feet) of gas.

**Bottom Hole Age** – The geologic age identified at the total depth of a well.

**Bottom Hole Calculation** – A code describing the method used to measure bottom hole pressure as either calculated (C) or measured (M).

**Bottom Hole Datum** - The reference datum used as the basis for measuring a bottom hole location. NAD 27 (N) is generally used.

**Bottom Hole Flow Pressure** – The flowing pressure measured at or near the bottom of a well during a well test.

**Bottom Hole Latitude** - The *latitudinal* location of the bottom of a wellbore.

**Bottom Hole Longitude** - The *longitudinal* location of the bottom of a wellbore.

**Bottom Hole Latitude/Longitude Source** - A code identifying the source of a bottomhole latitude/longitude coordinate, if the latitude and longitude is present in the record.

AM = AMMAN

FA = F&A Map Company

GI = GII (source code inactivated)

GP = GLOBAL POS

IH – IHSE LATITUDE LONGITUDE

LOC = LOCATION

OP = OPERATOR PROVIDED

PB = PBWDS LAT LONG (source code inactivated)

PI = PI

RT = REFLOWN TOBIN (source code inactivated)

TB = TOBIN BASEMAP
TM = TMC
TO = TOBIN
TS = TOBIN SUPERBASE
TW = TOBIN WEEKLY
US = USGS

**Bottom Hole Location** – The measured location of the end point of a wellbore.

**Bottom Hole Pressure** – The static or fluid pressure measured at or near the bottom of a well. In general, pressures are reported as PSIA (absolute). PSIG (gauge) pressures are reported for wells in OK, KS, TX-Hugoton Field-except unallocated, TX-West Panhandle field, Red Cave and Federal Offshore.

**Bottom Hole Pressure Calculation Code** – If the method of measuring the bottomhole pressure is calculated, the record is assigned a “C” code. If the method is measured, the record is assigned a code “M”.

**Bottom Hole Temperature (BHT)** – The measured temperature at or near the bottom of the wellbore or the tested formation.

**Browse List** – In several IHS applications, a browse list displays the results of a data query in a spreadsheet-like format.

**BSW** – Abbreviation for basic sediment and water.

**BTU (British Thermal Units)** - measured as the amount of heat required to raise the temperature of one pound of water one degree Fahrenheit under standard conditions of pressure and temperature.

**Bubble Map** – A map feature found in several IHS applications that is used for comparative purposes. A user can create and display a representative view of historic well production. Some displays will show cumulative production by entity while other displays are interactive and will show production over time.

**Build Up Radius** - The turning radius of the borehole from vertical to horizontal:

- **Long Build Up Radius** - Build-up rate of 2 to 6 degrees/100 ft. resulting in a turning radius of 700 – 2,000 ft. Lateral lengths can extend 4,000 ft. to 6 miles.
- **Medium Build Up Radius** - Build-up rate of 6 to 30 degrees/100 ft. resulting in a turning radius of 200 - 700 ft. Lateral lengths are between 1,000-3,500 ft.
- **Short Build Up Radius** - Build-up rate of 1 to 3 degrees/foot resulting in a turning radius of 20-40 ft. Lateral lengths are 1,200 ft. or less.

**Buildup Degrees Maximum** – The degree radius required to achieve a maximum rate of buildup.

**Buildup Feet Maximum** – The number of feet required to achieve maximum buildup.

**Burden** – In PowerTools this is the total revenue interest, which includes all royalty and overriding royalty interests, for non-working interest parties. For example, in a lease where all of the working interest owners’ revenue interests add up to 82 percent, the burden to the working interest would be 18 percent (100 percent minus 82 percent).
Bureau of Ocean Management, Regulation and Enforcement (formerly the MMS-Minerals Management Service) - was an agency reporting to the Department of the Interior that managed the nation’s natural gas, oil and other mineral resources in the ocean’s Outer Continental Shelf (OCS). In October 2011, the responsibilities of this agency were divided between the Bureau of Ocean Energy Management and the Bureau of Safety and Environmental Enforcement.

C

Calculated Absolute Open Flow – In a gas well, this is the calculated flow rate that a well would produce against zero sandface back pressure. Sandface is the area between the wellbore and the surrounding formation. Note that there is no AOF for oil wells.

CAOF – The abbreviation for calculated absolute open flow.

CAP – Abbreviation for Capacity. CAP test data is obtained from semi-annual production tests reported on the G-10 form in the state of Texas.

Carter Location – A land grid system based on latitudes and longitudes, utilized in the states of Kentucky and Tennessee. Carter townships consist of five minute by five minute quads.

Casing – Hollow steel pipe that is lowered into a wellbore and cemented into place. Casing will keep the borehole from caving in and will prevent formation fluids from entering the well. Types of casing include conductor pipe; surface casing; intermediate casing and production casing.

Casing Cement Amount - The amount of cement, reported in sacks, which is used to secure well casing in place.

Casing Depth - The depth measured from a surface well elevation reference point to the bottom of a casing string.

Casinghead Flow – The amount of flowing gas or fluid produced.

Casinghead Gas – Natural gas that is found in and produced with oil.

Casing Line Pressure - The pressure that has built up in the space between the casing strings in a well or between the casing and tubing strings, measured under flowing conditions. Pressures are reported as PSIA (absolute) or as PSIG (gauge).

Casing Sequence Number – A numbering system that is used to identify strings of casing.

Casing Size – Includes the diameter as well as length of the casing.

Cement Amount – See Casing Cement Amount.

Choke – A device used to constrict the flow of oil, gas or water.

Choke Size – The size of choke used during a flow test or for production. Sizes are expressed in 64ths of an inch.

Christmas Tree – Production equipment that includes a system of pipes, valves and gauges that are installed on a wellhead.
Closure - The distance plus the angle of offset that is measured from a well surface location to a point where the actual bottomhole location is projected onto the surface. The degree of angle has an implied 2-digit decimal.

Coalbed Methane – Methane-rich hydrocarbon gas produced from coal.

Coal Bed Methane Indicator - Information obtained from the state records that identifies whether or not the production of methane-rich gas qualifies for specific tax credits.

C = COALBED METHANE
D = DEVONIAN SHALE
M = MULTIPLE (TIGHT GAS/DEVONIAN SHALE)
T = TIGHT GAS

Comma Delimited Format – One of the formats used for data exports where record fields are separated by commas. Alpha and alphanumerical record fields are surrounded by double quote symbols (IHS uses double quote symbols, while the general standard is usually a single quote). The margins for record fields are not left and right justified. The last record field reported on a line does not end with a comma. Record fields are not filled with blanks or zeroes.

Comparison Discounts – In PowerTools, multiple effective discount rates can be entered into tables in order to produce summary comparisons in reports.

Commingle – Production combined from two or more zones in a well or combined production from two or more wells in a lease.

Commingled Facility Code – Alpha numeric code assigned to a central processing facility or production gathering point for oil properties.

Completion – The process of installing permanent production equipment on a well in order to produce oil or gas.

Completion Date – The date of the official filing of a completion report to an appropriate regulatory agency indicating that a well is established and ready to produce, ready for injection or is a dry hole.

Condensate – Liquid hydrocarbons that are separated from gas during production.

Condensate Ratio – The volume of condensate liquids divided by the residue gas volume.

Congressional – A rectangular survey system that was established in the United States by the National Land Act of 1785. This system is based on six-mile townships that are delineated by meridian lines that run in a north-south direction and base lines that run east and west. Townships are usually divided into 36 one mile square sections. Also known as a Jeffersonian survey, a Civil survey or a Dominion survey.

Contour Mapping – By connecting a series of points of similar value, a contour map provides a way to represent similar surface or subsurface features. In Petra, there are two types of contour maps: A Structure Map (i.e. formation tops) or an Isopach Map (i.e. formation thickness).
**Contractor** - See Drilling Contractor.

**Coordinate System** – A system that identifies map locations utilizing sets of numbers and/or letters. One set may represent a vertical position while another set may represent a horizontal position. A common choice of coordinates is latitude and longitude.

**Coordinate System Type** – An identifier for different coordinate systems such as Geographic, Local Spatial, Geocentric, Map Grid and Vertical.

**Coordinate System UOM** – Describes the Unit of Measurement that is utilized in a particular coordinate system such as meters or decimal degrees.

**Core** – A downhole test that is run while drilling a well in which an actual tubular sample of a formation is cut using a core tool and brought to the surface for examination.

**Core Base Depth** – A measurement taken from the surface of a well to the bottom or deepest footage of a cored depth.

**Core Interval Number** - A sequence number that is assigned to different sections of a core sample. This allows for the sequential identification of multiple observations and descriptions.

**Core Number** – A number that is assigned to a full diameter core sample. In some cases a number is also assigned to sidewall runs. This number is usually obtained from a core analysis document.

**Core Recovery** – Refers to the length of the core sample recovered.

**Core Show** – Evidence of hydrocarbons in place from a core sample.

**Core Thickness** - The total feet of a core sample that contains a similar lithology.

**Core Top Depth** – The measurement taken from the surface of a well to the top of the shallowest footage of a core or sidewall sample.

**Core Type** - The types of cores run and their associated database codes.

- CONV = CONVENTIONAL (code abbreviation changed from CV).
- DIMD = DIAMOND (the old database code DI is no longer active).
- PRES = PRESSURE (the old database code PR is no longer active).
- RADL = RADIAL (the old database code RD is no longer active).
- RTRY = ROTARY SIDEWALL.
- SDWL = SIDEWALL (the old database code SW is no longer active).
- SLCE = SLICE (the old database code SL is no longer active).
- TRGL = TRIANGLE (the old database code TL is no longer active).
- WIRE = WIRELINE (the old database code WL is no longer active).

**Cost Depletion** - A depletion method in which the allowance is a function of an investment amount and net remaining reserves.

**County Code** – The third through fifth digits in an API number represent the county where the surface location of a well is located.
County/Parish Code – A three-digit numeric code that is assigned by API to identify a county/parish. Codes are unique to a particular state and county/parish.

County/Parish Name – An eight-character IHS abbreviated county/parish name.

Criteria Log – The section in the main screen of the old PI/Dwights PLUS on CD application that displayed search criteria selected by a user for a data query.

Criteria Selector – This section appears in the column on the left side of the IHS Enerdeq Query page. The options in this section will let a user locate, define and select specific search criteria for a data query.

Cross Section Type – In Petra, cross section types are classified as either structural or stratigraphic. A structural cross section type utilizes depth intervals that are defined by upper and lower measured or sub-datum depths. A stratigraphic cross section type shows depths that are defined utilizing formation tops.

Cum Gas at Test Date - Is calculated by adding the reported cumulatives through the last complete month of production plus the production calculated for the portion of the month in which a test was done.

Cumulative Gas – The total amount of gas produced from the first reported date of production to last day of reported production.

Cumulative Gas Injection - The total amount of gas that has been injected into a well from the beginning of an injection project to January 1 of a subsequent year.

Cumulative Liquid Injection - The total amount of liquid that is injected into a well from the beginning of an injection project to January 1 of a subsequent year.

Cumulative Oil – The total amount of oil reported during the production life cycle of a well.

Cumulative Production – The total amount of oil, gas and water that was reported during the production life cycle of a well. Cumulative values can be found under the Production Abstract tab in an IHS Enerdeq Excel Output file.

Cumulative Water – The total amount of water produced from the first reported date of production to last reported date of production.

Cumulative Water Injection – The total amount of water that has been injected into a well or lease from the beginning of an injection project to January 1 of a subsequent year.

Current Month Production – Production figures for the latest month of reported production.

Current Well Status – The status of a well based on the last reported activity.

Curve Segment Handle – In a PowerTools graph, this is the square that displays at the end of the curve segment. The mouse pointer will change to a double-headed arrow when you hold it over the handle. Curve segments for curves with more than one segment share a common handle with an adjacent segment. Hyperbolic curve segments have an additional handle between the two end handles.

Cushion Amount - The amount of fluid pumped into the drill pipe prior to opening a test tool. This is done to help equalize the flow of reservoir gas or fluid flowing into the pipe. The amount is measured in feet.
**Cushion Type** - Type of fluid used as a cushion.
AMMON = AMMONIA
CO2 = CARBON DIOXIDE
MISRUn = MISRUN
MUD = MUD
NTGN = NITROGEN
OIL = OIL
OILWTR = OIL AND WATER
PIPFLR = PIPE FAILURE
PKRFLR = PACKER FAILURE
REVOUT = REVERSE OUT
TSTPLG = TESTER PLUGGED
U = UNKNOWN
WTR = WATER
WTRNGN = WATER AND NITROGEN

**D**

**Data Currency** – Refers to the currency of the data that you are working with in an IHS application.

**Data Entitlements** – see Entitlements.

**Data Integration** – The process of obtaining information from various databases and combining that information into a single database.

**Data Query** – The process of locating and selecting specific activity, well or production criteria in order to retrieve information that meets your specific requirements.

**Data Type** – Refers to the type of data that you are working within an application. Examples include activity data; well data, allocated production data and unallocated production data.

**Days on Production** - Number of days during a month that a well or lease was reported to have been producing.

**Decline Curve** – In a PowerTools graph, a decline curve can be fitted through data points to predict future production. A decline curve can be displayed for a single well or an entire field.

**Decline Curve Analysis** - A method that is used to analyze production histories of a producing well or lease to estimate remaining production; future production rates, and an economic limit date.
Decline at Effective Date – In PowerTools, this is the annualized decline rate over the first month after the effective date. The effective date is the month in which economic projections begin.

Deeper Pool Test – An exploratory test that is run in a well below the deepest known productive oil and/or gas pool within a field.

Default Preferences – Default application or data settings are built into several IHS products. In some cases, a user will have the option to utilize the application default settings or change the settings to meet their own preferences.

Delimiter - A delimiter is a sequence of one or more characters that can be used to separate data or field boundaries in various data streams. Export files in many of the IHS applications, will utilize either a fixed field format or a comma delimited format. A Fixed field format utilizes the full length of a field is used to hold data. In a comma delimited format, a comma is inserted after each data field, essentially creating a sequence of comma-delimited (separated) values.

Depletion - A deduction from taxable income for the removal and sales of oil and gas from a well, using either “cost” depletion or “percentage” depletion.

Depreciation - An allowance made for the loss in value of tangible assets because of wear, age, or other causes.

Depth Reference Point – The point from which depths are measured; such as depth measured from the kelly bushing (KB) or depth measured from the ground level (GR).

Depth Reference Elevation – The elevation of a reference point relative to Mean Sea Level.

Depth Registration – Combining digital depth information with standard log raster images.

Description of Recovery – A codified and abbreviated description of the type of material recovered during a test.

Development Well – A well drilled to the depth of a stratigraphic horizon in an area already proven to produce oil or gas.

Diapir – A large mass that intrudes vertically into pre-existing rock layers. By pushing upward and piercing through overlying rock layers, diapirs can form anticlines, salt domes and other structures capable of trapping hydrocarbons.

Diatom – A microscopic, single celled, freshwater or saltwater algae that has a silica-rich cell wall called a frustule. Generally, Diatoms are so abundant that they can form thick layers of sediment composed of the frustules of the organisms that died and sank. Frustules are an important component of deep-sea deposits.

Directional Indicator Abbreviation - A single-character abbreviation used to describe a type of borehole direction:

D = DIRECTIONAL - A wellbore path that purposely deviates from vertical to reach an objective. Generally this path has an angle of 6 to 75 degrees from vertical.

E = EXTENDED REACH - A horizontal wellbore whose horizontal length component is greater than the vertical length component of the borehole.
H = HORIZONTAL - A wellbore path with an endpoint greater than 75 degrees from vertical.

P = PINNATE – An unconventional horizontal drilling method in which the final drilling pattern resembles the veins of a leaf.

V or blank = VERTICAL - A wellbore path that is nearly vertical (less than 6 degrees deviation) from its surface point to its end point.

**Directional Survey Calculation Method** – Coded methods used to calculate downhole survey data.

AA = ANGLE AVERAGING

BT = BALANCE TANGENTIAL/TRAPEZOIDAL

CA = CIRCULAR ARC

ER = EXACT RADIUS OF CURVATURE

MC = MINIMUM CURVATURE

RC = RADIUS OF CURVATURE

T = TANGENTIAL

U = UNKNOWN

VA = VECTOR AVERAGING

**Directional Survey Processing Type** – Codes describing the processing type of a directional survey.

I = INTERPOLATED

M = MIXED

N = NONINTERPOLATED

**Directional Survey Run Number** - A unique number assigned by a survey company, identifying each directional survey conducted in a wellbore.

**Directional Survey Start/End Depth Unit of Measure** – The unit of measure in feet (F) or meters (M) for the start and end depths of a deviation survey.

**Directional Survey Type** – The survey method used to determine a wellbore path deviation. The following list is a representative sampling and their associated codes:

AB = ACID BOTTLE

BGT = BOREHOLE GEOMETRY TOOL

COMB = COMBINATION TOOL (UNSPECIFIED)

D = DIPMETER

EMS = ELECTRONIC MAGNETIC MULTI-SHOT

FMS = FORMATION MICROSCANNER

G = GYROSCOPIC

GCT = GUIDANCE CONTINUOUS TOOL
GMS = GYROSCOPIC MULTI-SHOT
MSS = MAGNETIC SINGLE SHOT
MWD = MEASURED WHILE DRILLING
SHDT = STRAT. HIGH RESOLUTION DIP TOOL
SS = SINGLE-SHOT
TO = TOTCO
U = UNKNOWN
WST = WIRELINE STEERING TOOL
GPIT = GEN. PURPOSE INCLINOMETER TOOL
GSS = GYROSCOPIC SINGLE-SHOT
GYRF = FINDER GYROSCOPIC
GYRP = PYGMY GYROSCOPIC
GYRR = UNSPECIFIED RATE GYROSCOPIC
HDT = HIGH RESOLUTION DIP TOOL
HDTD = HIGH RESOLUTION DIP TOOL (database code no longer active)
HDTG = HIGH RESOLUTION DIP TOOL (database code no longer active)
HDTS = HIGH RESOLUTION DIP TOOL (database code no longer active)
HRD = HIGH RESOLUTION DIP TOOL (database code no longer active)
M = MAGNETIC
MMS = MAGNETIC MULTI-SHOT
MS = MULTISHOT

**Directional Well** – A well drilled where the borehole angle ranges from 6 to 75 degrees from vertical.

**Discount Rate** - An adjustment that is applied to future monthly cash flow that shows its present value. The discount rate is expressed in percent discount per year.

**Discounted Value** - A value based on the total time value of future revenues.

**Discovery Well** – The first successful oil or gas well drilled in a new area that may establish a new producing field.

**Discovery Date** – The date assigned to the discovery of a new field.

**Disposal Well** – A well that is used for the disposal of salt water.

**District Number** – A two digit number that identifies a specific district within a state.

**Division of Interest Time Segment** - Interest ownership is determined by a combination of four values; working interest, revenue interest, lease burden, and overriding royalty interest. Any valid combination of these four entries that lasts for a specified length of time is referred to as a division of interest time segment. A division of interest reversion occurs at the point where one time segment ends and the following time segment begins.
The current division of interest is maintained through the end of the month in which the reversion event occurs. The new division of interest begins at the start of the following month.

**DMP Production Data Export format** – An old Legacy export data format from Dwights Energydata. This format is no longer supported by IHS as of December 31, 2000.

**DMP2 Production Data Export format** - is a revised version of the old Dwights Detail Production Export format (DMP). The primary emphasis in updating this record was to expand the date fields to be year 2000 compliant; adding latitude and longitude coordinates and improving the presentation of test records.

**Download Format** – Report and Export files can be generated, output and saved using specific format options such as MS Excel or XML.

**Drillers Top** – The lithological description used to identify changes in stratigraphic layers as a well is drilled.

**Drift Angle** – The angle of inclination away from the vertical axis of a wellbore.

**Drilling Contractor** – The company that is hired by an operator to drill a well.

**Drilling Media Type** – References the kind of drilling mud and any associated additives that are used while drilling a well.

**Drilling Narrative** – A descriptive account of events that occurred when a well was being drilled.

**Drilling Remarks** – Any comments or remarks that were added to a drilling narrative.

**Drilling Rig** – The structure that supports the drill pipe and associated mechanical apparatus used to drill a well.

**Drilling Rig Number** – The number assigned to a drilling rig by the drilling company.

**Drilling Status** – The description of the latest reported status of a well being drilled (drilling, waiting on cement, coring).

**Driller Total Depth** – The total depth of a wellbore, recorded by the drilling rig operator.

**Drillstem Test** – A downhole test in which a test tool is lowered into a well. Packers, located at the top and bottom of the test tool, are inflated in order to isolate the zone to be tested. The tool is opened, allowing fluids to flow into the test tool, and then it is shut in, creating a pressure build up. Recovered fluids from the test can be analyzed and flow and shut in pressures can be measured and recorded.

**Dry Hole** - A well that is incapable of producing sufficient quantities of oil or gas to justify completion.

**DST** - see Drillstem Test.

**DST Material Recovered** – The amount and type of mud, water, and hydrocarbons, if present, that have been recovered during a drillstem test.

**DUR** – Abbreviation for Duration (of test).
**Dwights RCI Number** – Is an old Retrieval Code Identifier number used by Dwights Energydata for well identification. This code is a combination of a report code, county code and unique identifier for the state. Other elements can reflect the status or region.

**Dwights WDS ID** – A unique 8-byte internal well control number that was used by Dwights Energydata for database management purposes. The first digit is an alpha code representing a specific region. The next six digits represent an internal control number unique to a region. The last digit is a sequential completion number.

**East/West Footage** - The number of feet measured east or west from a reference point to determine a wellbore surface location.

**East/West Direction** – An abbreviation used for the direction of a location from an east/west reference line.

**Economic Cashflow Analysis** – A PowerTools report that displays projected production, prices, expenses, and taxes over time.

**Economic Life** – In PowerTools this is the difference in months between a lease’s effective date and the lease’s economic limit. PowerTools calculates economic values for up to 600 months from an Effective Date.

**Economic Limit** – In PowerTools, the Economic Limit is the last month of positive cash flow or 1200 months, whichever comes first. It can also be described as the point at which the cost of producing oil or gas from a well equals the revenue derived from production.

**Economic Stop Date** – This is a user-specified date through which economics are calculated. In PowerTools, if an Economic Stop Date precedes the Economic Limit, the resulting monthly cash flow will be negative for those months between the calculated Economic Limit and the user defined Stop Date.

**Effective Date** – The beginning month from which PowerTools determines remaining reserves and predicts future economics.

**Equivalent Barrel** - A unit of measurement in which one barrel of oil (42 US gallons) equals six MCF (6,000 cubic feet) of gas.

**Electric Log** – A test tool that is lowered into a wellbore and emits electrical charges into the surrounding formation. The tool then measures the associated responses. Common types of electric logs include gamma-ray, caliper, resistivity, density porosity, and neutron porosity. Logging tools are usually stacked together, to make fewer trips into a hole. When analyzing the results from an electric log, a geologist can obtain information such as rock types, porosity or the presence of oil, gas or water.

**Elevation** - The distance measured above a reference point, such as sea level.

**Elevation Reference** – A reference point in a well from which depths are measured or at which elevation datum is determined.

CB = CENTER LINE BRADEN HEAD OUTLET (database code no longer active)

CF = CASING FLANGE/CASINGHEAD FLANGE
DF = DERRICK FLOOR
ES = ESTIMATED
GR = GROUND
KB = KELLY BUSHING
PT = PIPE TOP (database code no longer active)
RB = ROTARY BUSHING (database code no longer active)
RF = RIG FLOOR (database code no longer active)
RT = ROTARY TABLE

EnerdeqML Well Data Export format – An XML export format for well data in IHS Enerdeq.

EnerdeqML Production Data Export format – an XML export format for production data in IHS Enerdeq.

Enhanced Recovery – The process in which secondary recovery methods have been implemented in a well or lease to extend production.

Entitlement – Based on your subscription, this is data that you are entitled to use.

Entity – The terms “entity” and “property” are used synonymously. These terms represent the lowest producing level reported for an area, be it a lease or a well.

Entity Count - The number of properties or wells contained in a project. Counts are obtained using Unique Well Identifier (UWI) numbers, API numbers or Production ID numbers.

Escalation - In PowerTools, an escalation is a condition or prediction that occurs over a period of time. Escalations can be created in order to show changes in investments, prices, or expenses over time.

Escalation Limit - Escalations can be limited by date, time span, or by value.

Escalation Segment - Defines or represents a condition or prediction that occurs during a specific period of time in a PowerTools graph. A change in an escalation trend is represented by a new escalation segment. PowerTools limits an escalation to ten segments.

Ethane Gas – A byproduct of natural gas, ethane is a colorless, odorless gas at standard temperature and pressure.

EWE – In Petra, this is the abbreviation for East-West Offset.

Exploration Well – A well or series of wells drilled for the purpose of obtaining geological, geophysical or possible hydrocarbon information in a new area.

Exponential Allocation - An exponential allocation method that connects production test data points on a graph with a constant percentage decline curve.

Exponential Curve - A production decline rate or curve that changes at a constant percentage such as 10 percent per year. Plotting the average rate versus cumulative production forms a straight line on a PowerTools graph.
**Export File** – A file containing data and database objects that can be formatted for use in other files, programs or databases.

**Export Format** – A format that allows a user to output files of data from one database to another. See 297 Well Data Export format and 298 Production Data Export format at the beginning of this listing.

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**F**

**Farmout** – When an owner, who holds a working interest in an oil or gas lease, legally assigns all or part of the interest in the lease to another party in exchange for an agreed upon set of conditions.

**Fault** - A fracture or zone of fractures in the earth’s crust that results in an up and down or sideways displacement of the ground in an area or zone.

**Fault Type** – Describes the type of fault referenced (normal, reverse, strike, slip, thrust).

**Fault Name** – Common name given to a fault.

**FCP** – See Flowing Casing Pressure.

**Field** – An area comprised of similar geological structural features and/or stratigraphic conditions that may contain a single hydrocarbon reservoir or group of reservoirs.

**Field Code** – A standardized code assigned by IHS to a field name.

**Field Gravity** – The average gravity of hydrocarbons produced from a field.

**Field Name** - The name assigned by a regulatory agency to a producing or non-producing oil or gas field.

**Final Drill Date** – the date when the total depth reported by the driller was reached.

**Final Hydrostatic Pressure** – The pressure of the drilling mud overburden recorded at the end of a drillstem test.

**Final (initial) Flowing Pressure** - The pressure reading recorded at the beginning of the last recorded Time Open period during a drillstem test: Measured as psi.

**Final (final) Flowing Pressure** - The pressure reading at the end of the last recorded Time Open period during a drillstem stem test.

**Final Lahee Classification** - The final classification assigned to a well, based on the evaluation of the wells completion history, using the Lahee Well Classification System.

**Final Open Time** - The duration of the last period of time a test tool was left open during a test. Measured in minutes.

**Final Shut-in Pressure** – At the end of a well test, the pressure is measured after the well has been shut in for a period of time, allowing for pressure to be built up.

**Final Shut-in Time** - The duration of the last period of time the test tool was closed during a test. Measured in minutes.

**Final Status** – Refers to the status of a well or lease once it has been completed. This status can include oil, gas, oil and gas, multiple zone completions, injection or dry and abandoned.
**Final Survey Company** - Name of the company that made the final directional survey for a wellbore.

**Final Well Class Code** – A single-character code used to indicate the classification of a well at the time of completion. Examples of final well classifications and their assigned codes include:

1 = OIL WELL  
2 = GAS WELL  
3 = GAS AND CONDENSATE (DISTILLATE)  
4 = MULTIPLE COMPLETION, OIL  
5 = MULTIPLE COMPLETION, GAS  
6 = MULTIPLE COMPLETION, GAS AND CONDENSATE  
7 = MULTIPLE COMPLETION, OIL AND GAS  
8 = JUNKED AND ABANDONED WELL  
9 = INJ, SRV, CO2, STORAGE, WDW, PSEUDO ORIG, MINING BOREHOLE  
0 = DRY HOLE, TEMPORARILY ABANDONED  
L = LOCATION  
S = SUSPENDED  
T = WELL START  
A = ABANDONED LOCATION

**First Report Date** - The date in which information for a well/permit was first added to the IHS database.

**Fixed Format** – A report or export format in which individual data fields are defined by specific field lengths. If the amount of data is shorter than the designated field length, characters such as spaces or zeroes are used to fill the field.

**Flow Pressure** - The pressure that is recorded at the top of a well or at the wellhead as gas or liquids are produced.

**Flow Test Temperature** – The temperature of the fluid that is recovered during flow conditions.

**Flowing Casing Pressure** – The flowing pressure recorded in the casing string during a well test.

**Flowing Tubing Pressure** – The flowing pressure recorded in the tubing during a well test. In general, pressures are generally reported as PSIA (absolute). Pressures reported in the states of OK, KS and TX-Hugoton Field, TX-West Panhandle, Red Cave and Federal Offshore are reported as PSIG (gauge) pressures.

**Fluid Type** – Coded or abbreviated descriptions that are used to describe the type of fluid recovered during a well test include:

A = ACID  
COND = CONDENSATE
CUSH = CUSHION
F = FOAM
FLUD = FLUID
GAS = GAS
MUD = MUD
OIL = OIL (changed from O-OIL)
SWTR = SALT WATER
UNDEFINED = UNDEFINED
UNKNWN = UNKNOWN
WTR = WATER (changed from W-WATER)
WC = WATER CUSHION

**Forecast Line** – A line that displays in a Rate Time graph and a Pressure/Cum graph that shows a future production forecast scenario. The forecast line can be edited in order to create and analyze various production scenarios.

**Footage** - The number of feet measured from a reference point.

**Footage Origin** – A coded point of origin that is referenced when measuring a surveyed footage.

```
#  WC NORTH EAST COR
$  WC WEST QTR POST
&  WC NORTH QTR POST
/  WC SOUTH QTR POST
:  WC CENTER OF SECTION
;  WC SOUTH WEST COR
@  WC EAST QTR POST
+  WC NORTH WEST COR
=  WC SOUTH EAST COR
\  MONUMENT
0  WC X/Y COORDINATES
1  CONGRESS QTR QTR QTR QTR
2  TX QTR OR HALF SEC
3  NE MAP QUAD SECTION
4  CONGRESS LOCATION
5  CARTER TWP-RGE
6  CONGRESS MILITIA DONATION
7  CONGRESS GRANT
```
Footage Unit – The unit of measurement used in N/S and E/W footages: feet (F) or meters (M).
Formation – An underground layer of common rock.
Formation Age – The geologic age of an underground formation.
Formation at TD – See Formation at Total Depth.
**Formation at Total Depth** - The geologic formation that was penetrated at the bottom of a borehole.

**Formation at Total Depth Code** – A 3-digit industry standard age code and formation abbreviation based on the USGS Franklin Coding System. If a formation at total depth is not reported, the deepest reported formation will be used if it lies within 50 feet of the total depth.

**Formation Base Depth** – A depth measured from a point at the surface of a wellbore to the bottom of a formation (measured in feet).

**Formation Break Pressure** – An operator reported value for the minimum pressure (in psi) that it took to fracture a formation during a fracture job.

**Formation Code** - A code used to identify a specific geologic formation in a database. The code is comprised of an industry standard age code, up to 8 characters in length, and a formation abbreviation based on the USGS Franklin Coding System.

**Formation Depth** - Measured depth from a surface reference point to the top of an underground formation.

**Formation Name** – The name is given to a particular underground rock layer.

**Formation Source Code** – A code used in conjunction with a formation abbreviation to indicate the origin of formation information.

1 – Drillers Top
2 – Sample Top
3 – Log Top
4 – Top added or changed

**Formation Top** – The distance from a ground surface point to the top of an identified formation underground.

**Formation Top Alias** – In Petra, formation top aliasing allows multiple top names to be searched when searching for a single top name. In some cases, a top that is imported from a database may be abbreviated or misspelled.

**Fracking (Fracing/ Fracking/Hydraulic Fracturing)** – A process that involves pumping fluid under high pressure through the wellbore to create enough pressure downhole in order to crack or fracture a rock layer or formation. The fluid usually contains a proppant like sand to keep the resulting fissures open. This process will increase the permeability of a formation, allowing a greater volume of oil and gas to flow out.

**FTP** – See Flowing Tubing Pressure.

**Future Net Revenue** - Revenue anticipated over the life of a producing lease or property.

**G**

**Gas** – see Natural Gas.
Gas Cum – IHS references gas cum as the total volume of gas that was reportedly produced during the lifecycle of a well.

Gas Gravity – Specific gas gravity is the ratio of the molecular weight of a gas at a given temperature and pressure relative to the molecular weight of air (29.97, or ~29).

Gas/Oil Interface – The depth of the boundary that separates oil and the free gas cap in an underground oil reservoir.

Gas/Oil Ratio (GOR) – The measured volume of gas produced with oil. The volume is generally reported as cubic feet per barrel or cubic meters per ton.

Gas Opening Cum - In an IHS Enerdeq Excel Output file, this field provides a summary of the monthly historical amount of gas (cum production) from the beginning of a wells production to January 1 of a specific year.

Gas Per Day – The measured amount of natural gas that is produced from a well during a 24 hour period. Commonly referenced as MCFPD - thousand cubic feet per day.

Gas Rate - Unit of measurement for gas volumes.
TSTM = Abbreviation for Too Small to Measure.
UG = Abbreviation for Unmeasured Gas.
MCFPD = Thousand Cubic Feet per Day.
MMCFPD = Million Cubic Feet per Day.

Gas Runs Monthly Total – The total volume of gas or casing head gas that was produced and accounted for during a month through sales, lease usage, etc.

Gas Volume – The amount of gas recovered during a test.

Gas Well – A well completed solely for the production of natural gas.

Gatherer – Any pipeline, truck, motor vehicle or person authorized to gather or accept oil, gas or other natural resources from lease production or from a storage facility.

Geologic Province – A geographical area that contains similar geologic attributes. Similar attributes are often identified using a geologic time scale that describes the timing and relationships between geological events that have occurred in different areas throughout the history of the earth.

Geodetic Datum – Because the earth is an imperfect ellipsoid (a three dimensional ellipse), geodetic systems are used by cartographers to position objects on earth. A Geodetic Datum is a set of values that are used to define a specific geodetic system.

Gravity – The relative density of petroleum liquids. The American Petroleum Institute calculates degrees of gravity using the following formula: 141.5/specific gravity @ 60°F minus 131.5.

Ground Elevation – The ground level height at a well bore that is measured from Mean Sea Level.
High Lat/Longs (Tobin Superbase) – A Lat/Long measurement derived from Tobin’s Superbase database. Includes surface and bottomhole Lat/Long locations as they are available. Also includes bottomhole Lat/Longs on directional and horizontal wells.

Historical Well – In reference to the classification of a well, historical refers to a well that has been permitted, drilled and completed.

Historical Well Count – The number of historical wells located in an area.

Histogram – In PETRA, the Log Histogram module displays statistical histograms or data point summaries for selected log curves. Picks from the display can be digitized and stored in the PETRA Zone database. Histogram picks are typically used for log normalization.

Hole Direction – The borehole angle; deviation from center.

Horizontal Length in Formation – Refers to the measurement of a horizontal borehole from the entry point of a targeted formation to the end of the borehole.

Horizontal Drilling – A well that is not drilled vertically.

Horizontal Well – A well drilled with a borehole angle greater than 75 degrees from vertical.

Hub – The point where several pipelines meet and interconnect.

Hydraulic Fracturing – See Fraccing.

Hydrocarbon – A group of chemical compounds combining hydrogen and carbon molecules.

Hyperbolic Curve - In a PowerTools graph, a hyperbolic curve defines production in which the decline varies over time. This produces a curved line on a production plot.

IC Number – In some cases when an API number has not yet been assigned by a regulatory agency to a newly permitted well, IHS will assign an Internal Control (IC) number to the well in order to be able to enter it into the IHS database. IC numbers include a state code, a county code, a unique well code that begins with 70001 and a 4-digit year code. The year codes are the last 2 digits for years prior to 2000 (1999=99) and four digits for those the years 2000 and forward. (2000, 2001). When an API number has been assigned by the appropriate regulatory agency to the well, the API number will be added to the well record.

IHS U.S. Land Grid – IHS data sets that incorporate land grids and latitude/longitude information, delivered as shapefiles. These data sets are incorporated into existing IHS data, mapping and analysis products.

Inactive Well – A well is considered inactive if it has not been tested or if it has not been on production at any time during the current year. If a record is reviewed during the first quarter of the current year, any activity during the last quarter of the previous year will be considered before assigning a well an inactive status.
**Indicator** – Refers to the presence of or the existence of specific information that was gathered while drilling a well.

**Initial (Initial) Flowing Pressure** - The pressure reading, measured in psi, that is recorded at the beginning of the first open tool period during a drillstem test.

**Initial (Final) Flowing Pressure** - The pressure reading measured in psi, that is recorded at the end of the first open tool period during a drillstem test.

**Initial Hydrostatic Pressure** – The pressure of the drilling mud overburden recorded at the beginning of a drillstem test.

**Initial Investment** – In PowerTools, this is a time-zero investment amount that has not yet been affected by discount factors or escalations.

**Initial Lahee Class** - This is the intended classification of a well at the time a permit is applied for. Utilizing the Lahee Well Classification System, this is based on the degree of risk associated with the proposed well objective.

**Initial Potential (IP) Test** – A production test run on a well for a specified period of time to determine what the well’s potential production capability may be.

**Initial Shut-in Pressure** – The pressure recorded at the beginning of a shut-in period during a drillstem test.

**Initial Well Class** – A code used to indicate the initial intent for a well to be drilled, as specified by an operator at the time of permit.

**Injection Phase** - In PowerTools, an injection phase can be forecasted the same way that oil, gas or water can be forecasted. Injection data can be entered as monthly volumes. A user can also use the injection phase as an expense stream or revenue stream.

**Injection Well** – A well that is used to inject fluids into an underground formation. Injection wells can be used for waste water disposal; can be used to maintain reservoir pressure; can be used for enhanced oil recovery and for hydraulic fracturing.

**Input Pane** – In PowerTools, economic and volumetric data can be displayed and modified for individual wells or leases in the Input pane portion of the display.

**INS** – In Petra, this is the abbreviation for North-South Offset.

**Intangibles** – In PowerTools, these are expenditures that occur for items that do not have any recoverable value such as labor, fuel, repairs, etc.

**Intermediate Depth** – The measured depth of a rat hole.

**Internet Browser** - If you have access to the Internet, an internet browser enables you to connect to different web sites on the internet.

**Interval Top** – The measured depth to the top of a tested interval in a wellbore. If multiple intervals exist, the reference applies to the uppermost top.

**Interval Base** – The measured depth to the bottom of a tested interval in a wellbore. If multiple intervals exist, the reference applies to the lowest base.

**IP Test Number Code** – A 3-digit code assigned to identify an IP Test.

**IRIS 21** – The name of the IHS International energy database.
**Isopach** – A contour line that connects points of equal thickness in a geological stratum formation or group of formations.

**J**

**Junked and Abandoned** – Final status assigned to a well that was abandoned due to drilling problems or loss of equipment downhole.

**Jeffersonian Survey** – This survey system is based on a grid containing townships, ranges and sections. This survey system is also known as Congressional, Civil or Dominion.

**K**

**Kelly** – A high strength polygonal shaped pipe that fits into a bushing on the rotary table of a drilling rig. The drill string is attached to the Kelly.

**Kelly Bushing** – A polygonal shaped master bushing that sits in the drilling rigs rotary table. A polygonal shaped pipe called the Kelly fits into the Kelly Bushing. During the drilling process, the rotary table will rotate the Kelly Bushing which in turn will rotate the Kelly and the attached drill string.

**Kelly Bushing Elevation** – The distance measured from a reference point (such as sea level) to the Kelly Bushing on the drilling platform.

**Kick Off Point** – The point in a wellbore where the well begins to deviate from vertical to horizontal.

**KOP** – Abbreviation for Kick Off Point.

**KOP Measured Depth** – The measured depth from the surface of the wellbore to the point where the angle of a well begins to deviate from vertical to horizontal.

**KOP True Vertical Depth** – The measured vertical depth from the surface of a well to the kick off point where the vertical well bore begins to deviate.

**L**

**L&L** – Abbreviation for Latitude & Longitude.

**Labor** – A Labor is a subdivision of a League (Texas). There are 25 labors to a League. Each labor is approximately 177.1 acres.

**Lahee** – The name of the well classification system developed by noted structural and petroleum geologist Dr. Frederick Lahee.

**LAS** – The abbreviation for Log ASCII Standard. This is a standard well log format developed by the Canadian Well Logging Society. This format provides a basic digital log data format that is compatible with personal computers.
**Last Activity Date/ Last Update** – The last date in which any information on a well was added to or updated in the IHS database.

**Lateral Hole** – Identified as that portion of a wellbore that is drilled horizontally from a kick off point.

**Lateral Hole Length** - The measured length of a lateral hole from the kickoff point to the end of a lateral hole deviation.

**Lateral Hole Identification** - A unique identifier that is assigned to each lateral hole that is drilled from a vertical wellbore.

**Latitude** - Angular distance north (+) and south (-) of the earth's equator. The maximum value is 90 degrees (the measurement from the equator to a pole). Latitudes are displayed in decimal format to 5 places. US latitudes are positive values (north of the equator).

**Lat/Long Source Code** - A code identifying the source of a Latitude/Longitude coordinate measurement.

- AM = AMMAN
- FA = F&A MAP COMPANY
- GI = GII (database code no longer active)
- GP = GLOBAL POS
- IH=IHSE LATITUDE LONGITUDE
- LOC = LOCATION
- OP = OPERATOR PROVIDED
- PB = PBWDS LAT LONG (database code no longer active)
- PI = PI
- RT = RELOWN TOBIN (database code no longer active)
- TB = TOBIN BASEMAP
- TM = TMC
- TO = TOBIN
- TS = TOBIN SUPERBASE
- TW = TOBIN WEEKLY
- U = USGS

**Layer** – See Map Layer.

**Layer List** – Located on the left side of the Enerdeq Map page, layers from the expandable list can be selected and applied to the map view.

**League** – In Texas, a league is 4418 acres of land and consists of 25 labors.

**League Number** – A number assigned by the Texas General Land Office to a league.

**Lease** - In PowerTools, a lease is the lowest level at which production is reported in a given area. Depending on the lease type and state, it may correspond to a single well or completion, or be the accumulated production of multiple wells in a single lease.
Lease Burden - See Burden.

Lease Code – A code that is assigned by a regulatory agency that identifies the owner of the property that a lease resides on (Fee, State, Federal or Indian Lands).

Lease ID Number – A unique identification number assigned to a lease. In PowerTools, when properties are added to a project from a data source such as IHS Enerdeq, a lease number is assigned by IHS that corresponds to the lease Production ID number.

Lease Name – A name assigned to a lease by a regulatory agency that has jurisdiction over the minerals in the area where a lease is located. Names may be abbreviated by IHS if they contain more than 19 characters.

Legal Subdivision – The legal description of a subdivision within a Texas survey or abstract that has been divided into leagues, labors and/or sections.

Length of Pay – The measured length of a producing formation.

Letter Quadrangle – In an NTS Location survey, a Primary Quadrangle is divided into 16 Letter Quadrangles. A letter quadrangle is bound by 1 degree of latitude and 2 degrees of longitude.

Liner - A casing liner can be set downhole to protect casing from corrosive elements, to repair damaged casing, if permitted, or it can be used as a production string, if using a slotted or pre-perforated liner.

Liner Base – The measured distance from a well elevation reference point to the bottom of the liner.

Liner Cement Amount – The amount of cement used to secure a casing liner in place within a borehole.

Liner Sequence Number – Sequential Numbers are assigned to identify each change in casing liner size.

Liner Size - Diameter of the outside of the casing liner.

Liner Top – The measured distance from a well elevation reference point to the top of the liner.

Liner Type - The type of liner that is used in a well.

BLANK = BLANK
COALP = COAL PROTECTING
COMBO = COMBINATION – PERF’D & PORTED
EXPND = EXPANDABLE
GVLPK = GRAVEL PACKED
PEAKC = PEAK COMPLETION LINER
PPERF = PREPERFORATED
PORTD = PORTED
SCAB = SCAB
SCREE = SCREEN
SLOT = SLOTTED
SLPPS=SLOTTED/PACKERS PLUS SYSTEM

**Liquid Gravity** – The API gravity of liquid hydrocarbons, calculated by dividing the specific gravity of a fluid at 60 degrees Fahrenheit into 141.5 and subtracting 131.5.

**Liquids per Day** - The amount of oil or condensate that is produced from a well per day. Measured as barrels per day (BOPD, BCPD).

**Liquid Runs Monthly Total** – The total volume of oil or condensate that was produced and accounted for during a month through sales, lease usage, etc.

**Lithology** – The description of the composition of a rock.

**Lithology Code** – A two letter coded description of the composition of a rock. The following is a partial list of codes:

- AN = ANHYDRITE
- AS = ASH
- CG = CONGLOMERATE
- CH = CHAT
- CK = CHALK
- CO = COAL
- CT = CHERT
- CY = CLAY
- DN = DENSE
- DO = DOLOMITE
- DT = DETRITAL
- ER = ERODED
- GR = GRANITE
- GW = GRANITE WASH
- GY = GYPSUM
- HA = SALT
- LG = LIGNITE
- LS = LIMESTONE
- MR = MARLSTONE
- MV = MASSIVE
- NV = NOVACULITE
- OL = OOLITE
- OT = OTHER
- PR = POROSITY
Load Lease/Well – In PowerTools, you can load a lease or well in a PowerTools project for analysis by double-clicking on the lease in the Lease Tree or on a well in the Well Tree.

Log – A downhole survey that is run in a well in order to gather information about subsurface formations. Also known as well logs, borehole logs or wireline logs.

Log Export Formats – Petra supports the following log export formats:

- LAS - Industry standard log ASCII format.
- LIS - Industry standard binary log format.
- Tabular - ASCII file containing log values as data columns.
- MORE - Formatted for MORE simulators.
- RC2 - RC2's ResPrep ASCII file format.

Log Base Depth – The distance measured from a well surface reference point to the bottom of a logged interval.

Log Curve Alias – In Petra, log curve alias names will let a user search multiple log names in order to locate a single log name. The alias list will be searched only if the original log name is missing.

Log Curve Type – After running a downhole log survey, different types of curves are displayed on a grid sheet that can provide information regarding characteristics of the various formations penetrated.

Logger Total Depth - The total depth of a wellbore determined from a log survey.

Logging Company – The name of the company who ran a log survey in a well.

Log Run Date – The date a particular log survey was run in a well.

Log Run Number - A unique identifier for a wireline log survey. A sequence of numbers is usually assigned by a contractor to identify a particular series of log operations that were run in a wellbore at or about at the same date.

Log Top – Refers to the top of an underground formation, identified from the results of a downhole log survey.
**Log Top Depth** - Distance from surface datum to the top of a logged interval.

**Log Type** – Identifies the type of downhole log survey run in a well (i.e. gamma ray, neutron porosity, formation density).

**Longitude** - Angular distance east (+) and west (-) of the prime meridian. Maximum value is 180 degrees. Longitudes are displayed in decimal format to 5 places. US longitudes are negative values.

**Lost Material** – Describes the type of material used in treating a lost circulation interval in a wellbore. This can include materials such as walnut hulls or chicken feathers.

**Lot** – A subdivision of land within a survey, block or tract. Labors are often divided into lots.

**Lot Code** – A database code that identifies a sub-division of a section or tract.

**Lot or Section Indicator** - Indicator for lot (L) or section (S).

**Lot or Section Number** – A number that has been assigned to a lot, section or allotment.

**Low Lat/Long (USGS)** – A Lat/Long measurement provided by IHS that has been calculated from a USGS grid. These are surface locations only. There are no bottomhole Lat/Longs for onshore wells. Low Lat/Longs do provide bottomhole locations for directional offshore wells.

**Lower Perforation Depth** – The measured depth to the bottom of a perforated interval.

**M**

**MMS** – Abbreviation for Minerals Management Service. (see Bureau of Ocean Management, Regulation and Enforcement).

**MMS Field Alias** – A common name used to identify an offshore field area in the Gulf of Mexico before an official field name has been assigned.

**MMS Suffix** - A sub-completion code obtained from the Mineral Management Service.

**Main Module** – see Petra Main Module.

**Map Distance from Monument to Surface Location** – The measured distance from a surveyed monument to a particular surface location.

**Map Extent** – The location and data parameters for a current map view.

**Map Layer** – A geographical data set that can be added to a map such as a road, field or basin. Layers will display in the map view and information can be retrieved from the layer file.

**Map Projection** – A coded scheme used when displaying the earth's curved surface on a flat plane surface. Often used while calculating X/Y coordinates.

L = Lambert
M = Mercator
O = Oblique Mercator
U = UTM
Map Zone Code - USGS identifier in a coordinate system, that indicates the point of origin from which X/Y coordinates are measured. The first two digits represent a state code and the second two digits represent the USGS zone identifier for an area.

Maximum Angle of Deviation - The maximum angle of deviation recorded when drilling a horizontal well.

Max IP (Initial Potential) Values – In an IHS Enerdeq Excel Output file, the values displayed in the columns under the MAX IP header are reported values for Production IP tests.

Max IP Dates – The date in which the highest IP volumes for oil or gas were reported.

Max IP for Oil/ Gas and Water – These are separate fields in an IHS Enerdeq Excel Output file that represent the value of the maximum IP test volumes reported during the life cycle of a well for each respective phase.

Max Production Volume – Oil – In an IHS Enerdeq Excel Output file this value shows the maximum monthly oil volume reported during the life cycle of a well.

Maximum Survey Depth – In Petra, this is a well location option where well symbols are spotted at the position of the deepest survey depth.

MD – Abbreviation for Measured Depth.

Mean Formation Depth – The mean depth of an underground formation equals the sum of the formation depths measured in an area divided by the number of depths measured.

Mean Sea Level (MSL) – A calculated reference point derived by measuring the level of the surface of the sea between mean (average) high tide and mean (average) low tide, over an extended period of time.

Measured Depth of Terminus – The well depth measured from the surface of the main vertical wellbore to the end or terminus of a sidetracked hole.

Medium Lat/Longs (Tobin Base Map) – Per Tobin, Base Map Lat/Longs are (+) or (-) 500 feet of accuracy and are reported “as available” and can include bottom hole Lat/Longs on directional and horizontal wells.

Meridian – A line of longitude that runs vertically from the North Pole to the South Pole.

Meridian Code – A two-digit code that is assigned by IHS and Tobin International to each recognized meridian. The codes are based on USGS Meridian codes.

Meridian Direction – A code that identifies the East (E) or West (W) direction of a meridian.

Meridian Name - Name of the survey of intersecting lines from which townships and ranges are numbered. This applies to Congressional locations and is based on USGS names.

Measured Total Depth - The measured depth, in feet, along the wellbore path from a specified surface point to the actual bottom hole of a well.

Measurement Codes – Codes for amounts expressed in weights or volumes.

BBL = Barrels
CF = Cubic Feet
FT = Feet
GAL = Gallon
LB = Pounds
MCF = Thousand Cubic Feet
QT = Quart
SACK = Sacks
TON = Tons

**Method of Escalation** – In PowerTools, an escalation can be created by multiplying the value for each month by a percentage; by adding an increment to each monthly value or by substituting another number for the initial value entered for a lease.

**Method of Production Code** – A single-digit code that represents the method used for recovering hydrocarbons from a well or lease.

- A = AIR LIFT
- B = BALING
- E = ENTRY (FILL-UP)
- F = FLOWING
- G = GAS LIFT
- I = PRODUCTION ON INTERMITTER
- J = JETTED
- L = PLUNGER LIFT
- P = PUMPING
- R = REVERSED OUT
- S = SWABBING
- U = UNDESIGNATED
- V = VACUUM LIFT
- W = WATER LIFT

**Michigan Permit Number** – A permit number assigned to wells by the state of Michigan’s regulatory agency.

**Midstream** – Term used to describe or reference the infrastructure required to produce, process, refine and transport liquid and gas hydrocarbons. Includes, but is not limited to pipelines, plants, ports and refineries.

**MLT** – Abbreviation for measured log thickness.

**Mo Values** - In an IHS Enerdeq Excel Output file, columns labelled as **Mo** values identify production volumes during the month for a specified number of months.
**Mode** - Defines whether the last reported producing status of a lease or well is producing or inactive. An active property means there has been some production recorded at least sometime during the current calendar year. Inactive properties have no production recorded during the current calendar year.

**Monthly Production Volumes** – will display under the Monthly Production tab in an IHS Enerdeq Excel Output file.

**Monument** – A benchmark, GPS station or other physical reference point used as a survey reference to position well locations, seismic points or other points of interest.

**Monument ID** - Identifying code for a reference marker. Every monument will have a latitude and longitude associated with it.

**Monument Name** - Name given to a physical reference point used to measure well locations. Generally found in Louisiana, Mississippi, Alabama, and Gulf Zone areas were location points are difficult to define. Also called a Marker.

**Mud** – A fluid emulsion that is circulated through the drill pipe and wellbore during a drilling operation.

**Mud Depth** - The measured depth from the surface of a well to the point where the mud weight was recorded.

**Mud Weight** - The density of the drilling mud used in a wellbore. Mud weight is directly related to the amount of pressure it exerts to contain formation pressures.

**Multiple Completion Well** – A well that is equipped with multiple strings of tubing or other equipment in order to produce oil and/or gas separately from more than one producing zone.

**Multiple Segment Decline Curves** – In a PowerTools graph, there can be up to ten decline curve segments with each representing oil, gas, water production and either injection or natural gas liquids. Each segment can affect cash flows and reports for the span of time represented by the segment.

**N**

**N-Factor** – When plotting a back pressure potential curve, N is equal to the tangent of the angle that is formed by a vertical axis and the curve.

**N Value** – When working with coordinate systems, N value is the difference between an ellipsoid and a geoid at a point at which the datum is defined.

**NTS** – Abbreviation for National Topographic Series (a survey system).

**NTS Block** – Under the NTS survey system. A block is an area bounded by 5 minutes of latitude and by 7.5 minutes of longitude. A grid is divided into 6 blocks.

**NTS Unit** – A block is divided into 100 units.

**Named Township** - Identifies a general surface area within a county in addition to other location descriptions. Can also be the name of a town, a civil township, a municipality or a district.

**Narrative** – A descriptive account of events that have occurred over a period of time.
**Natural Gas** – A gas containing a mixture of hydrocarbon molecules and carbon atoms.

**Natural Gas Liquids (NGL)** – Liquids derived from the processing of natural gas including condensate, ethane, butane and propane.

**Net Cashflow** - Revenue minus expenses, minus taxes, minus investments.

**Net Revenue** – The income derived from oil and gas production after all costs including taxes, royalties, and other assessments have been made.

**New Field Wildcat** – A well drilled into a structural feature or other type of trap in an area that has never produced oil or gas.

**New Pool Wildcat** – A new pool that is discovered in an existing field that is already producing oil or gas from a different reservoir.

**NGL** – See Natural Gas Liquids.

**Non-Steered Horizontal Drilling** – A horizontal drilling method that utilizes ultra-short and short buildup radius laterals. Identified by the code (N) in the IHS database.

**Normalized Data/Month** – In an Enerdeq Xcel production file, normalized data/month is the first full month of production. Typically this starts in month 2 because monthly production volumes rarely start on the 1st day of the month. A Normalized Cum for a full year would be normalized from months 2 thru 13.

**Normalized Production** – Normalized production for the first full year (12 months) of a well or lease.

**Normalized Type Curve** – PowerTools will let you normalize production and injection/NGL data for selected leases in a project. Monthly production data is normalized back to January 1960, and then well counts and subsequent volumes are then summarized.

**North Reference** – A coded reference used to identify the northerly direction used in a horizontal directional survey.

G = GRID NORTH - AN ARTIFICIALLY DESIGNATED LOCAL NORTH REFERENCE

M = MAGNETIC NORTH - MAGNETIC NORTH POLE

T = TRUE NORTH - GEOGRAPHIC NORTH POLE

U = UNKNOWN

X = ASSUMED GRID NORTH

Y = ASSUMED MAGNETIC NORTH

Z = ASSUMED TRUE NORTH

**North/South Direction** - Abbreviations are used to indicate the direction of a location from a north/south reference line.

**North/South Footage** - The number of feet measured north or south from a reference point to a well in order to determine the surface location of the wellbore.
**Number of Active Wells** – The number of wells, based on regulatory agency reports and well tests that are assumed to be contributing to the monthly production of a lease for a given month.

**Number of Injection Wells** – The number of wells in the lease that are injected during a given month.

**OCS** – Abbreviation for Outer Continental Shelf.

**OCS Number** – A unique number assigned to an Outer Continental Shelf lease at the time of sale. Numbers are 5 or 6 characters long and zero filled to the left.

**OUOM** – Abbreviation for Original Unit of Measure.

**Offshore** – The area located seaward from a coastline.

**Offshore Block** – Typically a nine square mile subdivision of an OCS area defined in degrees of latitude and longitude.

**Offshore Governing Agency Code** – A database code that shows if a well is located in Federal Offshore waters (F), State offshore waters (S) or in a Bay (B).

**Offshore Location** – The specific location of a well within a grid of blocks in either Federal or State waters.

**Offshore Water Depth** – See Water Depth.

**Oil Flow** – The flow of oil from a well measured during a test or during production without artificial means.

**Oil Gravity** – The API gravity of liquid hydrocarbons, calculated by dividing the specific gravity of a fluid at 60 degrees Fahrenheit into 141.5 and subtracting 131.5.

**Oil Opening Cum** - In an IHS Enerdeq Excel Output file, this column provides a summary of a monthly historical amount of oil (cumulative production) from the beginning of a well’s production to January 1 of a subsequent year.

**Oil Rate** - Unit of Measure for oil volumes.

BBL = BARRELS

FT = FEET

GAL = GALLONS

GAL/DAY = GALLONS PER DAY

GAL/HR = GALLONS PER HOUR

**Oil Volume** – The oil or condensate volume recovered during a test.

**Oil/Water Interface** – The depth of the boundary that separates oil and water in a reservoir.

**Oil Well** – A well completed for the production of crude oil from at least one zone or reservoir.

**Oldest Penetrated Age** – Oldest geologic age that was penetrated while drilling a well.
**Operating Income** - Income that is calculated by multiplying production by revenue interest and prices.

**Operator Code** – An IHS assigned code for a company or individual who last reported to the state regulatory agency as having control of the operation and management of a producing well or property. Operator names, abbreviations and codes are standardized by IHS and are unique to the database.

**Operator-Current** – The current operator of record for a well.

**Operator Name** - Company or individual who had control and management of the drilling procedures at the time a well was completed.

**Operator-Original** – The original operator of record for a well.

**Outpost** – A well drilled with the intent to extend the boundary of an existing field.

**Output Tree** – In PowerTools, this is a pop-up window that displays analysis results for a selected entity in a current project.

**Overriding Royalty Interest** – Refers to a royalty or payment that is paid to an individual or company who owns a portion of the revenues generated from the production of oil and gas in a well, without having to pay associated drilling or monthly operating expenses.

**PI 98 Export** – An old legacy production export format that is no longer supported. This format had to be updated in order to be year 2000 compliant.

**PSI** – A unit of measure for the amount of pressure on an area one square inch.

**PSIA** – Pounds of pressure per square inch (absolute) using absolute zero as a base.

**PSIG** – Pounds of pressure per square inch (gauge), where atmospheric pressure is used as a base.

**Parameter Data** – In Petra, this is the data that contains individual settings that represent your own view in a particular project.

**Pan Tool** – A tool in the Enerdeq map that will let you re-position an area of interest.

**Payout Date** - The first month of production where cumulative cash flow becomes positive.

**Pay Thickness** – The vertical thickness of a pay zone. The reported thickness can be either net or gross.

**Percentage Depletion** – Depletion is a deduction that can be applied to taxable income (federal taxes) for the removal and sales of oil and gas from a well or property. To figure percentage depletion, multiply a certain percentage (normally 15% for independent producers or royalty owners) times the gross income derived from the property during a tax year.

**Percent Water Cut** – The percent of water contained in the recovery of mud or liquid or gas during a well test.
**Perforation** – A hole, or series of holes, that are shot through a well casing; through a liner; through cement or directly into a formation that will allow oil, gas or water to flow into and up the well casing and/or tubing.

**Perforation-Lower** – The lowest point of a perforated interval.

**Perforation Type** – The type of perforation method used to perforate a well.

AJET - ABRASIJET
BULLT - BULLET
CONE - CONE
JET - JET
NOTCH - NOTCH
PORTS - PORTS-ONE DEPTH
PPERF - PREPERFORATED
RING – RING
RIP - RIP
RJET - RADIAL JET
SDRLL - SAND DRILL
SECUR - SECURALOY
SLOT – SLOTTED

**Perforation-Upper** – The uppermost point of a perforated interval.

**Permeability** – The measured ability of a fluid to flow through a rock. Measurement units are reported in millidarcies or darcies.

**Permit** – The written approval issued by a regulatory agency allowing an operator to drill a well at a particular location.

**Permit Date** – The date that a permit to drill is approved and issued by a regulatory agency.

**Permit Filer Name** - Name of the person who signed the permit application for the operator.

**Permit Filer Title** - Position title of the permit filer (i.e. Owner, President).

**Permit Number** – A number that is assigned by a regulatory agency to a drilling permit.

**Petra Main Module** – After launching the Petra application, the initial screen that displays is the Main Module. This screen provides access to the data base information for a current project.

**Petra Project** – Contains all relevant data to a particular geographic area. This includes well information; locations; well logs; seismic shot point locations and attributes and land grids.

**PI Entity ID** – An old Petroleum Information production entity identification number.

**PIDM** – The abbreviation for Petroleum Information Data Model.
Pilot Hole – A vertical well bore that is drilled to specifically identify a particular formation for the sole purpose of drilling a horizontal lateral.

Platform – An offshore structure that supports drilling and production equipment.

Plug back Base Depth – A well may be completed from a shallower depth than the original total depth. The portion of the well below the new completion zone can be closed off with a plug (usually cement). The plug back base depth is the depth from the surface of the well to the lowest depth of the plug.

Plug back Top Depth – A well may be completed from a shallower depth than the original total depth. The portion of the well below the new completion zone can be closed off with a plug (usually cement). The plug back top depth is the measured depth from the surface of the well to the top of the plug.

Plugged Date – The year and month that a well was plugged. Data is obtained from various state plugging reports, when available.

POE – Abbreviation for Point of Entry. This is the point where a horizontal wellbore penetrates a targeted formation.

POE Measured Depth – The measured depth from the surface of a well to the point where the drill bit enters a targeted formation.

POE True Vertical Depth – The true vertical depth, measured along a straight vertical plane, from the surface of the well to the Point of Entry in a well.

Point Type – The specific point in a 4-point test from which analysis data is recorded.

Pool – The term is similar to the term reservoir, although a pool may consist of more than one reservoir.

Porosity – The measured percent of void space in a rock.

Porosity Type – The type of porosity present in a rock (i.e. cavern, fracture, interparticle).

Porosity Zone Base Depth – The measured depth from a surface point of a wellbore to the lowest point or base depth of an identified zone of porosity in a well.

Porosity Zone Formation – The name of the underground formation that encompasses an identified zone of porosity.

Porosity Zone Top Depth - The measured depth from a surface point of a well to the top of an identified zone of porosity in a well.

PTools*.pdb - A PowerTools project template is shipped with each version of PowerTools. The most recent project templates are Ptools92.pdb (for version 9.2) and PTools93.pdb (for version 9.3).

PowerTools Project - A Microsoft Access database containing available information for all leases imported into a PowerTools project. The project database can store historical data, economic input (oil and gas prices, interests, investments, expenses) and volumetric data for the leases. A project also stores the results of reserves and economic calculations.

Present Worth Cashflow - (Discounted cash flow) Income from future oil and gas production for which the time value of money has been accounted for.
**Present Worth Rate** - A value, expressed in percent per year, which is used to account for the time value of money. Also called the Primary Discount Rate.

**Primary Discount Rate** - A value, expressed in percent per year, that is used in net present value calculations. This is the primary rate in which to discount the value of future revenues (net present value) at each monthly time interval.

**Primary Product Code** – An IHS single-digit code that identifies if production for a property is reported predominantly oil (O), gas (G), or injection (I).

**Prime Meridian** – Also known as the Greenwich Meridian. This is the starting point from which measures of Longitude begin. Measures of Longitude are negative to the west of the Prime Meridian and positive to the east, up to 180°.

**Principle Meridian** – The meridian from which surveys are run and numbered.

**Primary Quadrangle** – An area bounded by 4 degrees of latitude and 8 degrees of longitude.

**Prior Production** – Any production that occurred in the period between the date of first production and the date at which production was actually reported and logged on a monthly basis.

**Private Project Directory** – In Petra, there are two primary data paths. The Private Project Directory contains a user’s parameters and session settings. This directory path is typically not shared with other users. Also see Public Project Directory.

**Producing Formation** - The reported geologic formation from which hydrocarbons are produced in a well. Also referred to as a Production Zone.

**Producing Formation Code** - A 3-digit industry standard age code combined with a formation abbreviation. Based on the USGS Franklin Coding System.

**Producing Method** – The method used to recover or produce hydrocarbons or water from a well or lease. The list below includes the codes associated with each method.

- A = AIR LIFT
- B = BALING
- E = ENTRY (FILL-UP)
- F = FLOWING
- G = GAS LIFT
- I = PRODUCTION ON INTERMITTER
- J = JETTED
- L = PLUNGER LIFT
- P = PUMPING
- R = REVERSED OUT
- S = SWABBING
- U = UNDESIGNATED
- V = VACUUM LIFT
W = WATER LIFT
31 = GAS LIFT 1000-1 EXCEPTION
51 = CASING LEAK
52 = DESIGNATE WELL
60 = RECEIVING WELL
71 = WATER WELL SHUT-DOWN

**Product Code** – A code assigned to a well that identifies it as being an oil well, a gas well or an injection well.

**Product Type** – Describes the type of product being produced from or injected into a well. Can include oil, gas, CO2, condensate, water or air.

**Production Cumulative** – The total amount of hydrocarbons or water that were produced from a well or lease through the last date of reported monthly production.

**Production Data** – Information identifying and describing the removal of gas, oil and water from a subsurface reservoir. This can include reservoir information and pressure data.

**Production Data (Allocated)** – Production that has been allocated from the lease level to the well level.

**Production Data (Unallocated)** – Lease level production.

**Production ID** - A unique identification number that is comprised of a product code, state code, district code, and an IHS assigned number.

**Production Last 12 months** – The last 12 months of historical production that was reported to a local or federal regulator. This differs from **Production Year-to-Date** in which historical production is reported for the current calendar year.

**Production Method** – The method in which oil, gas or water is produced from a well or lease (flow, pump). See Producing Method.

**Production Status** – The current status of a producing well (active, flowing, pumping, inactive or shut in).

**Production Stop Date** – The last date of reported production for a lease or entity.

**Production Tax** - A tax that is paid when oil and gas are produced. This is also known as wellhead tax and can include Ad Valorem and Severance taxes.

**Production Zone** – An underground formation or specific interval from which oil, gas or water are being produced.

**Project Data** – In Petra, this is the data that can be shared among team members with access to a project.

**Project Defaults** – In PowerTools, project defaults are used for graph settings, economics, and volumetrics for each lease, when specific values from another data source are missing.
**Project Pane** – This is the section in the PowerTools screen that displays leases, wells and project settings for a current project. This pane provides three separate tabs: the Wells tab, the Leases tab, and the Settings tab.

**Project Settings** - Project settings apply to all leases in the PowerTools project. Some settings (effective date, discount table) are project settings and affect every lease in the project. Other settings (i.e. prices, cost, and interest cases) can be edited at the lease level.

**Projected Depth** – A proposed total depth for a new well.

**Projected Formation** – The targeted formation to be penetrated for the proposed total depth of a well.

**Projected Formation Code** – A 3-digit industry standard age code that is combined with a formation abbreviation. Based on the USGS Franklin coding system.

**Propane** – A hydrocarbon gas.

**Proposed Bottom Hole Location** – A proposed bottom hole location for a new well.

**Proposed Bottom Hole Location East/West Direction** – The proposed bottom hole location of a new well that is estimated from an east/west reference line.

**Proposed Bottom Hole Location East/West Footage** - The proposed bottom hole location of a new well that is estimated from an east/west reference line - measured in feet.

**Proposed Bottom Hole Location Footage Reference Point** – The point of reference that is used to measure the bottom hole location of a propose well.

**Proposed Bottom Hole Location North/South Direction** – The direction of a proposed bottom hole location, estimated from a from a north/south reference point.

**Proposed Bottom Hole Location North/South Footage** - The targeted location of the end point of a wellbore, measured north or south from a reference point, in feet.

**Proposed Bottom Hole Location X Coordinate** – An operator supplied proposed bottom hole location based on a map projection system using a common reference point. The X-coordinate is measured north (+) or south (-) from this reference point.

**Proposed Bottom Hole Location Y Coordinate** – An operator supplied proposed bottom hole location based on a map projection system using a common reference point. The Y-coordinate is measured east (+) or west (-) from this reference point.

**Proppant** - A granular substance that is suspended in fracturing fluid in order to keep fracture cracks open when the fluid is withdrawn. The following list includes common proppant names and their associated codes:

ALUM = ALUMINUM PELLETS (database code no longer active)

BUXT = BAUXITE

CER = CERAMIC

CRYS = CRYSTALS

GLSS = GLASS BEADS

GRVL = GRAVEL
MRBL = MARBLE
NYLR = NYLON BEADS
PLBT = PLASTIC BEADS
RCCR = RC RESIN-COATED CERAMIC
RCSD = RC RESIN-COATED SAND
SAND = SAND
SDBD = SAND BEADS
SHLL = SHELLS
TGPROP = TAGGED PROPPANT
TRPROP = TRACED PROPPANT
U = UNKNOWN
UCERRCCR = UNKNOWN/CERAMIC/RC CERAMIC
UGRVL = UNKNOWN/GRAVEL
UMRBL = UNKNOWN/MARBLE
URCCR = UNKNOWN/RC CERAMIC
URCSD = UNKNOWN/RC SAND
UNFCER = UNDERFIRED CERAMIC
USANDCERRCCR = UNKNOWN/SAND/CERAMIC/RC CERAMIC
USANDRCCR = UNKNOWN/SAND/RC CERAMIC
USANDRCSD = UNKNOWN/SAND/RC SAND
UWLNT = UNKNOWN/WALNUT HULLS
WLNT = WALNUT HULLS

Province Code - AAPG codes that represent a province or basin in which geologic features, stratigraphy and structure are similar.

Province Name – The name given to a division of land within a country.

Pseudo Wells – In Petra, these are wells with a special database flag that indicate they are not real wells but are added to a project to be used as an additional control for drawing tops in the cross section module.

PTX File – In earlier versions of PowerTools, this file type was used to transfer lease information from one PowerTools project to another. A newer XML file type is now recommended as it allows a user to transfer lease information as well as project settings.

Public Project Directory – In Petra, there are two primary data paths. The Public Project Directory is referred to as the shared directory. This directory provides group access to a project.
Quick Report – In Enerdeq, a Quick Report can be generated by clicking the Quick View Report icon next to an entity in a Browse list.

Quad Scale Area Size – USGS 7.5 or 15 minute area.

Quadrangle Name – The name of the USGS 7.5 or 15 minute area on a map where a wellbore is located.

Quadrangle Section – A USGS quadrangle section is made up of 9 alpha sections.

Quarter Unit – Under the NTS survey system, a block is divided into 100 units. Each unit is divided into 4 quarter units.

Railroad District – A group of oil and gas districts created and managed by the Texas Railroad Commission.

1 = RR DISTRICT 01
2 = RR DISTRICT 02
3 = RR DISTRICT 03
4 = RR DISTRICT 04
5 = RR DISTRICT 05
6 = RR DISTRICT 06
7B = RR DISTRICT 7B
7C = RR DISTRICT 7C
8 = RR DISTRICT 08
8A = RR DISTRICT 8A
9 = RR DISTRICT 09
10 = RR DISTRICT 10

Range - Generally consist of 25 one-minute by one-minute sections (Carter) or 36 one mile square sections (Congressional) of land.

Range Direction – The east (E) or west (W) direction of a range from a surveyed base line.

Range Number - The number assigned to a division of land east or west of the surveyed base line. Some numbers may contain fractions to one decimal place.

Rate of Return (ROR) – In PowerTools, this is the percentage in which the discounted present worth becomes zero.

Raster Log – A scanned version of a hard-copy log that provides a high quality, low cost alternative to hardcopy and digital logs. Raster log technology allows for full online log display and manipulation.
Rat Hole – An opening in the drilling rig floor that is used to hold the swivel and kelly when removing drill pipe from the wellbore (tripping out).

Raw File – Old PI Legacy production data export format which is no longer supported.

Reason Horizontally Drilled – Codes that are used to explain why a well was drilled horizontally.

Recovery Amount – The amount of fluid or gas that was recovered during a well test.

Recoverable Reserves - The volume of hydrocarbons that can be profitably extracted from a reservoir using existing technology. Recoverable reserves can be calculated using decline curve analysis, pressure analysis, or volumetric calculations.

Recovery Type – The type of fluid or gas recovered during a well test. See Fluid Type.

Reference Datum – Is a global model of zero elevation which is sea level. The most common datum references in North America are NAD27, NAD83 and WGS84. Can be used to calculate latitude and longitude for a point on the earth’s surface.

Reference Elevation – The height of a reference point above mean sea level.

Reference Latitude - Reference latitude line from which a well location is measured. This is relative to northeast locations only, with the exception of the state of Ohio.

Reference Longitude - Reference longitude line from which a well location is measured. This is relative to northeast locations only with the exception of the state of Ohio.

Region – An IHS area of data coverage in the U.S.

Region Code – A two-digit IHS database code assigned to a region of data coverage. Codes and the associated regions are as follows:

GM - GULF OF MEXICO
TK - KANSAS, TEXAS 10, OKLA PANHANDLE
NE - NORTHEASTERN US
AL - NORTHERN LOUISIANA / ARKANSAS
OK - OKLAHOMA
PB - PERMIAN BASIN
RM - ROCKY MOUNTAIN
SE - SOUTHEASTERN US
SL - SOUTHERN LOUISIANA
T1 - TEXAS 1-4
T2 - TEXAS 5,6,9,7B
WA - WEST COAST / ALASKA

Regulatory Code – Depending the state, this is usually the same as the Lease Code.
**Remaining Reserves** - The cumulative production of oil and/or gas from an effective date to the economic limit of a well. This is the amount of oil or gas that can be profitably extracted from the well.

**Repeat Tops** – Horizontally drilled wells can cross into a single formation top multiple times. These multiple top depths can now be stored as repeats in Petra. This makes viewing, picking, analyzing, and gridding horizontal and deviated wells simpler and faster.

**Reserve Method Code** – An alpha code identifying the type of reserve method used.
- VO = Volumetric
- MB = Material Balance
- PD = Production Decline

**Reservoir** – A permeable and porous underground formation containing hydrocarbons that are contained or capped by an impermeable rock layer.

**Reservoir Name** - The name of a formation or pool that contains oil and/or gas.

**Reservoir Pressure** – The measured or calculated pressure of a producing formation. PowerTools utilizes the initial reservoir pressure of the production zone.

**Return on Investment (ROI)** - The operating income divided by the initial investment.

**Revenue** - Income from the sale of hydrocarbons.

**Revenue Interest** – An interest in a lease or well that receives a proportionate share of revenue from the sale of hydrocarbons.

**Reversions** - Changes in interest based on time, investments, or production.

**Rig** – See Drilling Rig.

**Rig Release Date** – The date when a drilling rig is released from a drilling operation and moved from a well site.

**Rig Status** – A description of the operational status of a drilling rig.

**Risk** - Risk modifies economic analysis by applying various user-entered factors to the PowerTools calculation streams.

**Rounding Rules** - PowerTools computes all economic values on a monthly basis to the fullest precision possible. When PowerTools needs to print a value on a report, it first calculates that value by adding the individual monthly amounts that comprise the output value. PowerTools then rounds the final output for the report.

**Royalty** – A payment made to a landowner or owner of mineral rights who may be entitled to a portion or percentage of a producing well’s revenues.

**Run Amount** – The volume of fluid, liquid or gas, reported by a purchaser or transporter.

**SSTVD** – in Petra, this is the abbreviation for Subsea True Vertical Depth.
**Salvage** - Salvage is usually tied to investments that can be disposed of at the end of the lease to recover some amount of investment. PowerTools does not add-in salvage values until the end of the economic life of the lease. All salvage values are counted in the last month where the lease shows a positive cash flow. Salvage amounts for initial or additional investments are not escalated by the investment scenario, if one exists.

**Sample Type** – Refers to the type of sample taken from a core test.

**Scale** – The relationship in size between a map and the earth’s surface.

**Scout Data** – Well and completion information obtained by an IHS data accumulation scout from various industry sources.

**Scout Ticket Report** – A Well Data Report in Enerdeq in which data is presented in blocks of information or by major category.

**SCP** – See Shut-in Casing Pressure.

**Section or Equivalent Indicator** – A code that identifies a portion of land as a section or equivalent. The indicators and codes are as follows:

 ACC = ACCRETION  
 BAY = BAY  
 BLK = BLOCK  
 DIV = DIVISION  
 GRT = GRANT  
 LAK = LAKE  
 LOC = LOCATION  
 MD = MILITIA DONATION  
 MRL = MICH ROAD LAND SEC  
 RES = RESERVE  
 SEC = SECTION /PROJECTED SECTION  
 SUR = SURVEY

**Section Fraction** - Number identifying a non-standard fractional portion of a section (ex: .5). Usually these are bounded by county lines or rivers, or are correction sections.

**Section or Labor Indicator** – Indicator identifying a section (S) or labor (L).

**Section or Labor Name** – In Texas, sections are smaller divisions of land within a survey or township. Size and number of sections will vary. Labors are subdivisions of leagues, 25 labors to a league. Each labor contains approximately 177.1 acres.

**Section Number** - Carter sections are generally numbered 1 through 25, Congressional sections are generally numbered 1 through 36.

**Select** – To highlight an entity or group of entities in an IHS application. In many cases, an entity or group of entities must be selected in order to be included in a data query or to be included in reports and exports.
**Serial Number** – A number that is assigned by a regulatory agency, in some states, to identify a producing property.

**Service Well** – A well drilled or completed for the purpose of supporting production in an existing field.

**Severance Tax** - A tax levied by some states on each barrel of oil or each thousand cubic feet of gas produced.

**Shallower Pool Test** – A test that is run in a well in search of a shallower producing zone.

**Shapefile** – A non-topological format used to store geometric location and attribute information for geographic features.

**Shortcut Menu** – A list of application command options that display in a pop-up window. Generally, this menu can be accessed by right clicking in an open area of an IHS application screen.

**Shotpoint Interval** – Refers to the distance between each shotpoint or vibration point along on a seismic line during a seismic test.

**Show Type** – A code identifying the type of hydrocarbon show during a well test.

**Shut-in Casing Pressure** – The built up pressure recorded in the casing string after a well has been shut in.

**Shut-in Tubing Pressure** – The built up pressure recorded in the tubing string after a well has been shut in.

**Shut Off Method Type and Associated Database Code** - The mechanism that is used to isolate a test zone from other zones to keep them from contributing gas or fluid to a zone being tested.

- BLRT = BAILER TEST
- BRPG = BRIDGE PLUG
- CASD = CASED OFF
- CPWT = CASING PACKER WITH TREATMENT
- CSPK = CASING PACKER
- CPPI = CLOSED PREVIOUSLY PRODUCING INTERVAL
- HOOK = HOOK WALL PACKER
- PLUG = PLUGGED OFF
- RBP = RETRIEVABLE BRIDGE PLUG
- SWPK = SIDEWALL PACKER
- SQZD = SQUEEZED
- STRD = STRADDLE PACKER
- TSTR = TESTING WITH TREATMENT
- UNDG = UNDESIGNATED
**Shrinkage** – In PowerTools, this is an adjustment to net production, where shrinkage is a percentage value representing lost volume.

**Source** – The individual, company, state or government agency that provides information.

**Source of Formation Top Data** – A code that identifies the source for formation top data – Also see **Formation Source Code**.

**Sour Gas** – Natural gas that contains high amounts of sulfur or hydrogen sulfide.

**Spatial Data** – Data describing locations, boundaries and relationships among geographic features.

**Spatial Data Model** – (SDM) A model comprised of a number of SDE layers that are generated from a variety of sources. There are two major types of layers: Cultural; and Exploration/Production.

**Spoke** - A short range lateral hole drilled from a main lateral hole.

**Spoke Length** - Length of a spoke, measured from the spoke kickoff point to its end point.

**Spoke Measured Depth** – The measured depth from the surface of a well to the end of the spoke.

**Spoke True Vertical Depth** – The true vertical depth measured along a vertical plane from the surface to the end of the spoke.

**Spoke X Coordinate** – An operator supplied location point of a spoke termination point. This measurement is based on a map projection system using a common reference point. The X-coordinate is measured north (+) or south (-) of the reference point.

**Spoke Y Coordinate** – An operator supplied location point of a spoke termination. This measurement is based on a map projection system using a common reference point. The Y-coordinate is measured east (+) or west (-) of the reference point.

**Spot** – An identifier that narrows a location to a portion of a section or lot. A normal section is divided into quarters and can contain up to 3-quarter calls (e.g. SE NE NW - the SE quarter of the NE quarter of the NW quarter within a particular section. Irregular sections may only have 1-quarter call.

**Spud Date** - The date when drilling operations began on a well (drill bit penetrating the surface of the ground).

**Stage Number** – Formation fracturing is done in stages. The stage number identifies the stage involved as different types fluids are injected into a wellbore.

**Standard Cubic Foot of Gas** – The amount of gas that occupies one cubic foot of volume when saturated with water vapor at 60°F at a pressure of 30 inches of mercury.

**State Permit Number** – See Permit Number.

**State Code** - Two-digit numeric code assigned by the API for a particular state.

**State/Federal Waters** - State waters are normally located within 3 miles of the coastline. Federal waters are located from 3-12 miles offshore. Gulf of Mexico deep waters are located more than 12 miles out. State water properties are regulated by the appropriate
state agency, while Federal water properties are regulated by the Minerals Management Service.

**State/Federal Waters Indicator** – An alpha code indicating if well is located in state (S) or federal (F) waters.

**State Zone** – A code identifying the coordinate system used for a zone within a particular state.

**Status Code** – A code that describes the original status, previous status or current status of a well or entity.

**Steered Horizontal Drilling** – A horizontal drilling method that utilizes medium to long build up radius laterals. Identified by the code (S) in the IHS database. Non-Steered Horizontal Drilling utilizes Ultra Short/Short radius laterals.

**Stop Date** - See Economic Stop Date.

**Stop Rate** – In PowerTools, this is the monthly production rate for oil or gas that defines the economic limit for a property.

**Stratigraphic Wells** – A well or series of wells drilled to obtain geologic information in order to analyze sub-surface conditions. These types of wells are generally drilled without the intention of being completed for hydrocarbon production.

**STP** – Abbreviation for Shut-in Tubing Pressure.

**Sub-Basin** – A sub division of a main geological province.

**Survey** - A survey is a division of land measured by metes and bounds within a county.

**Survey Company** – The name of the company that conducts a survey.

**Survey Date** – The date a survey was conducted.

**Survey ID** – Number uniquely identifying each directional survey performed in a well.

**Survey Name** – Names are assigned by the Texas General Land Office to a survey.

**Surface Abandon Date** – The date that surface operations were abandoned on a well site.

**Surface Datum** - A reference point from which surface position measurements are made. Horizontal datums are used to describe a point on the earth’s surface utilizing a coordinate system such as latitude and longitude.

**Surface Latitude** – The angular distance north (+) and south (-) from the earth's equator. The maximum value is 90 degrees. Latitudes are displayed in decimal format to 5 places. US latitudes will be positive values.

**Surface Lat/Long Source** - A code identifying the vendor source of the latitudes and longitudes, if a lat/long is present.

AM = AMMAN
FA = F&A
GI = GII
GP = GLOBAL POS.
LOC = LOCATION
OP = OPERATOR PROVIDED
PB = PBWDS LAT LONG
PI = PI
RT = REFLOWN TOBIN
TB = TOBIN BASEMAP
TM = TMC
TO = TOBIN
TS = TOBIN SUPERBASE
TW = TOBIN WEEKLY
US = USGS

Surface Longitude – The angular distance east (+) and west (-) from the prime meridian. The maximum value is 180 degrees. Longitudes are displayed in decimal format to 5 places. US longitudes will be negative values.

Tangible - Expenditures incurred for items that retain some resale value such as surface equipment, etc.

Tax Credit Type – Tax credit incentives were provided to operators to drill and complete certain types of wells such as Coalbed Methane and Devonian Shale wells.

TD – Abbreviation for Total Depth.

Temperature Gradient – The rate of temperature change in a field measured from point to point.

Template – In Enerdeq, the way that information displays in Browse lists, Exports, Reports and Graphs is defined by templates. Templates are classified as either public (IHS created templates) or private (user defined templates).

Test Date – The date a test was run, displayed as year-month-day. If no date is given, the 15th is used.

Test Duration - Duration of a test expressed in hours, rounded to nearest tenth of an hour.

Test Number – A number that is assigned to an IP test.

Test Results – A description of the total amount of material recovered during a well test as well as reported flow and shut in pressures.

Test Show – The evidence of hydrocarbons found with the recovery of fluids during a well test.

Test Type Code – A code that identifies the type of test that was run to evaluate a well (drillstem test, initial potential test, production test).
**Tested Interval Base** – the measured depth from the surface of a well to the lowest point of a tested interval.

**Tested Interval Top** – The depth from the surface of a well to the top of an interval being tested in a well.

**Texas Survey Name** – The name assigned to a valid Texas Survey. Names can be abbreviated.

**Thematic Mapper** – In Petra, the Thematic Mapping module is used to import, display, query and colorize ESRI Shape Files and send the results to the Petra Mapping Module.

**Time To Surface** – The reported time it takes for materials to return to the surface of a well during a drillstem test.

**Tobin** – A mapping source that can be used to identify latitude and longitude locations found in various mapping applications.

**Tool Box** – The portion of the PowerTools screen that provides interactive displays for production data and analysis results as graphs, as a map, or in various PowerTools generated reports.

**Top Choke** - Diameter of the choke at the top of a formation test tool that restricts the flow of gas or fluid from entering into the drill pipe. Measured in 64ths of an inch.

**Total Depth** - The deeper depth identified from either the Drillers Total Depth or Loggers Total Depth.

**Total Depth Value** – A number value that represents the total depth of a well (can be a logger total depth, driller total depth true vertical depth etc.).

**Total Horizontal Displacement** - The distance shown on a map from the wellbore to the terminus or end of a lateral hole.

**Township** - A 6-mile by 6-mile square containing 36 sections. Each section is one square mile each. In PowerTools, if township, range, or section values are not available for a particular lease or well, the default value for each is zero.

**Township Direction** - North (N) or south (S) direction of the township from the surveyed base line.

**Township Name** – A name assigned to a township.

**Township Number** - The number or alpha letter assigned to a division of land north or south of a surveyed base line. Carter townships are assigned letters A to GG. Congressional townships are assigned numbers. Some numbers may be expressed as fractions.

**Track** – In Petra, this is the display area beneath a well that defines the position of log traces relative to the depth axis.

**Transport Date** – The year, month and day in which gas or liquids were transported.

**Transporter Name** - Name of the primary company reporting the sale or transport of fluid from a well or lease.

**Transporter Run Type Code** - Codes used to describe the type of liquids purchased or transported.
CGRUN = SALES-CASINGHEAD GAS
CDRUN = SALES-CO2
CNRUN = SALES-CONDENSATE
GRUN = SALES-GAS
ORUN = SALES-OIL

**Treatment Fluid Types and Database Codes**

A=ACID
ABF=ACID BRINE FRAC
ACFR=ACID FRAC / MURICFRAC / DOLOFRAC / DUOFRAC
ACHL=ALCOHOL – METHANOL
AGFR=ACIDGELFRAC
BAFR=BEADACIDFRAC
BDA = BREAKDOWN ACID
BGFR=BEADGELFRAC
BKDN=BREAKDOWN
BOFR=BEADOILFRAC
BWFR=BEADWATERFRAC
BXGF=BAUXITE GELFRAC
CLAG=CLEANING AGENT / MUD CLEANING AGENT
CO2=CARBON DIOXIDE
CRA=CHEMICALLY RETARDED ACID
DOC=DEISEL OIL CEMENT SQUEEZE
DOIL=DEISEL OIL
FFR=FOAM FRAC
FLSH = FLUSH
FLUID=FLUID
FRAC=FRACTURING
GAFR=GASFRAC
GEL=GEL
GFR=GELFRAC
GOF=GEOFRACTING
GROK=ROCKED WITH GAS
HEAT=HEAT
HOIL=HOT OIL
KCL=POTASSIUM CHLORIDE
KERO=KEROSENE
MA=MUD ACID
MAF=MUD ACID FRAC
NAF=NITROGEN ACID FRAC
NASF=NITROGEN ACID SAND FRAC
NTFR=NITROGEN FRAC
NTNL=NATURAL
NTTN=NITROGEN
OFR=OILFRAC / VISOF RAC / STRATOFRAC / PETROGEL
PERF=PERFORATIONS IN OPENHOLE
PLST=PLASTICIZED / SANFIX
SAFR=SANDACIDFRAC / MURICFRAC / DOLOFRAC / DUOFRAC
SAGF=SANDACIDGELFRAC
SBAF=SANDBEADACIDFRAC
SDBG=F=SANDBEADGELFRAC
SBWF=SANDBEADWATERFRAC
SCFR=SANDCO2FRAC
SDFR=SANDFRAC
SDFX=SANDFIX
SEFR=SANDEMULSIONFRAC
SFAC=SURFACTANT
SFFR=SANDFOAMFRAC
SAGF=SANDGASFRAC
SGFR=SANDGELFRAC
SGOF=SANDGEOFRAC
SKFR=SANDKEROSENEFRAC
SLKW=SLICK WATER
SOFR=SDOILFRAC / VISOF RAC / STRATOFRAC/PETROGEL
STFR=STRESSFRAC
SWFR=SDWTFRAC / MY-T-FRAC / ULTRAFRAC / WIDEFRAC / DOWELLFRAC
SWNF=SALT WATER NITORGEN FRAC
U=UNREPORTED TREATMENT
VBFR=VIBRAFRAC
VSQZ=VISQUEEZE
WFR=WATERFRAC / MY-T-FRAC / ULTRAFRAC / WIDEFRAC / DOWELLFRAC
X-LINKGEL=X-LINK GEL
XPLO=EXPLOSIVE NITROGLYCYRINE

**Treatment Number** – A number assigned to a specific well treatment.

**True Vertical Depth** – The vertical straight line depth of a well, measured from a surface reference point to the drillers total depth.

**True Vertical Depth of Terminus** – The distance measured from a well surface to a spoke terminus, along a vertical plane.

**TST** – In Petra, this is the abbreviation for True Stratigraphic Thickness.

**TSTM** – Abbreviation for Too Small to Measure.

**Tubing** – Smaller diameter strings of pipe that are set inside well casing through which oil and gas are produced.

**Tubing Depth** – The measured depth to the bottom of the tubing string.

**Tubing Size** – The diameter of the outside of the tubing.

**Tubing Pressure** - The pressure at the wellhead when all valves are closed and the well is shut in.

**TVD** – see True Vertical Depth.

**TVT** – In Petra, this is the abbreviation for True Vertical Thickness.

**TX RRC** – See Railroad District.

**Type of Additive** - Refers to the type of additive used in formation treatment fluid.

**Type of Recovery** – Refers to the type of materials recovered from a well test.

**Type of Treatment** – The type of treatment used to improve the productivity of a well.

**ACID** = ACID

**BDA** = BREAKDOWN ACID

**BKDN** = BREAKDOWN

**FLSH** = FLUSH

**FRAC** = FRACTURING

**NTRL** = NATURAL

**REACID** – RE-ACID

**REFRAC** – RE-FRAC

**SGFR** – SANDGELFRAC (database code inactivated)

**TRET** – TREATMENT

**U** = UNREPORTED TREATMENT
Ultimate Production Values - The estimated ultimate recovery which a property is expected to produce during its lifetime.

Ultimate Reserves - Remaining reserves plus any prior production.

Unconventional Oil/Gas – Refers to the use of non-traditional extraction and production techniques to recover petroleum and petroleum related products from underground sources such as tight oil sands and shales. Can include Coalbed Methane gas found in coal

Unique ID – See UWI.

Unit Code – A code that identifies a group of generally contiguous leases with potential or producing mineral properties that are usually held by a single ownership.

Unit of Measurement - Fluid units of measure.
BBL = Barrels
BLR = Bailers
CC = Cubic Centimeters
CF = Cubic Feet
FT = Feet
GAL = Gallons
IN = Inches
ML = Milliliter
PT = Pint
QT = Quart
STD = Strand
TR = Trace

Upper Perforation Depth – The measured depth to the top of a perforated interval in the wellbore.

UTM – Abbreviation for Universal Transverse Mercator.

UTM Grid – A mapping grid that utilizes a system of coordinates that are measured from perpendicular reference baselines.

UTM Quadrant – One degree by two degree map quadrants.

UWI (Unique Well Identifier) – API numbers are unique identifiers for well data records while Production ID’s are unique identifiers for Production Data records. An Internal Control (IC) number assigned by IHS may be used if an API number has not yet been assigned by a regulatory agency.
Volume Units – See Unit of Measurement.

Volumetrics - A method of calculating the reserves of an oil or gas reservoir based on the reservoir area, thickness, and various properties of the reservoir formation such as porosity, permeability, and connate water saturation.

Water Bottom Zone Codes - Used in offshore Louisiana legacy data to identify a special allowable area or zone. The codes designates if a well is in a bay, an estuary, on a shelf, or in deep water.

0 = DELTA AREA (LOUISIANA ZONE 0)
1 = STATE WATERBOTTOM (LOUISIANA ZONE 1)
2 = STATE-FEDERAL CONTESTED (LA. ZONE 2)
3 = STATE CLAIMED (LOUISIANA ZONE 3)
4 = FEDERAL WATERBOTTOM (LOUISIANA ZONE 4)

Water Depth - The depth of the water at an offshore drilling platform, measured from the water level to the mud line.

Water Flow – The reported amount of water that flowed during a test.

Water per Day - The amount of water produced from a well during a 24 hour period. Measured as barrels/per day.

Water/Reference Datum - Identifies the point near a well where water depth measurements were taken:

EST = ESTIMATED
MHHW = MEAN HIGHER HIGH WATER
MHW = MEAN HIGH WATER
MLLW = MEAN LOWER LOW WATER
MLW = MEAN LOW WATER
MSL = MEAN SEA LEVEL
MTL = MEAN TIDE LEVEL

Water Volume – The amount of water recovered during a test.

TW = Trace of Water
UW = Unmeasured Water
BBL = Barrels
CF = Cubic Feet
FT = Feet
GAL = Gallons
Well – A hole drilled into the ground with the intent to produce oil or gas.

Wellbore – The actual Borehole that is drilled into the ground.

Wellbore Viewer Lite - A utility available in PI/Dwights PLUS that lets a user view a representation of wellbore data, such as casing programs, formation tops and IP Test data.

Well Class – Based on the Lahee Well Classification system, a classification is assigned to a well before it is drilled and again after it has been completed.

Well Count – In PowerTools, the annual average well count is calculated by summing the monthly well counts over the year, and dividing by twelve.

Well Data – Information relating to a well and wellbore, including well identification and location, drilling activity, downhole tests, well status, formation information, total depth and plugback depths, abandonment information and information describing the completion process of evaluating a well in order to bring it into production.

Well Number – A number that is assigned by the operator of record to a well.

Well Nbr – Abbreviation for Well Number.

Well Number Prefix – A four-character number that identifies production platforms and/or development wells.

Well Sequence Number (WSN) – When wells are imported into a Petra project, the Petra database automatically assigns a unique well sequence number to each well. This number is used for data retrieval purposes.

Well Serial Number – In Louisiana and Alabama, this is the number on the well permit from the state at the time permission was granted to drill the well. This number is also assigned to well completions.

Well, Selected – See Selected Well.

Well Status - Single character code identifying the status of a well as Active or Inactive. If the well has been tested or shown to be producing sometime within the current calendar year it will be listed as "Active" (A). If it has not been producing in the current calendar year it will be listed as "Inactive" (I).

Well Suffix – A six-character code that identifies a well work over, sidetrack or re-entry.

Well Type – The code or description of the type of completion performed on a well.

Whipstock – A tool or wedge used in a wellbore to turn the drill pipe in a different direction to deviate the well.

Whipstock Depth - The measured depth of the wellbore to the whip stock location.

WHSIP – Abbreviation for Well Head Shut-In Pressure.

Working Interest - The company(s) or individual(s) who own an interest in a well or lease and are responsible for the associated operating and drilling costs.

Worm Track – In Petra, this shows the borehole path of a deviated well in a map view.

Write Date – The date a file was created in the IHS database.

WSN – in Petra, this is the abbreviation for Well Sequence Number.
**X**

**X Coordinate** – An operator supplied surface location measured from a point of origin on a coordinate grid. This is usually the first number of an ordered pair that represents a horizontal measurement along the grid. Usually expressed as a positive value (+).

**Y**

**Y Coordinate** – An operator supplied surface location measured from a point of origin on a coordinate grid. This is usually the second number of an ordered pair that represents a vertical measurement along the grid. Usually expressed as a positive (+) value.

**Yield** - The oil to gas ratio, expressed as bbl/mcf.

**Year of Production** – A specific year in which a well or lease produced oil or gas.

**Years on Production** – The number of years a well or lease produced oil or gas.

**Year to Date Cumulative** – The total production of oil or gas from January 1 of the current year to the last date of reported production for the year.

**Z**

**Z-Factor** – A number representing the compressibility factor of gas. Z factors are determined from a modified Sims & Gray table. A LaGrange multiple point interpolation is used on this table to determine the compressibility factor at a specific pressure and temperature.

**Zone** – When applied to the term reservoir, a zone refers to an interval that contains one or more common characteristics such as lithology, saturation or porosity. In Petra, a zone is referred to as a logical grouping of all data items associated with a particular depth interval. Examples include: an isopach, net pay and porosity–feet.