



What is a Well?

The PPDM Association is a global not-for-profit standards organization that collaborates with industry experts to create common baseline definitions and best practices around E&P data management.



R-2.4 September 2014

© Copyright 2014, PPDM Association. All Rights Reserved

Table of Contents

Well Set	1
Well	3
Well Components	7
Well Origin	9
Wellbore	11
Wellbore Segment	13
Wellbore Contact Interval	15
Wellbore Completion	17
Wellhead Stream	21
Well Reporting	23
Well Reporting Stream	25

Booklet Feedback

If you would like to provide any comments or feedback on the definitions or diagrams please email them to WIAWfeedback@ppdm.org.



Success up here

depends
on what you know
down here.

Subsurface intelligence is everything.

Understanding the subsurface is everything when producing unconventional assets. EnergyIQ delivers E&P Data Management Solutions that enable companies to exploit unconventional plays with less risk. Learn how our Trusted Data Manager (TDM) application suite can help you value, acquire, and produce assets with greater certainty, speed, and collaboration. Visit www.energyiq.info, or call us at (303) 790-0919.



7061 S University Blvd, Suite 304, Centennial, CO 80122 (303) 790-0919



About the PPDM Association

“Driving better business decisions through E&P data management standards”

The Professional Petroleum Data Management (PPDM) Association is a global, not-for-profit standards organization that works collaboratively with industry to create and publish data management standards for the resource industry. Through the PPDM Association, worldwide petroleum data experts gather together in a collaborative, round table approach to engineer business driven, pragmatic data management standards that will meet industry needs.

We are dedicated to achieving our long-term goal of global adoption of E&P data management standards by expanding our presence internationally and building upon successes in North America, Australia, South America and Europe. We will continue to maintain and expand the PPDM Data Model to support the needs of our members. In addition, we will place increased emphasis on expanding data management standards, with a focus on:

- Training around data management standards.
- Certification programs for E&P data management professionals.
- Business rules for PPDM data model implementation with an emphasis on best practices for small organizations.
- Standards definitions to complement the “What is a Well?” initiative.
- Best practices for developing a data governance and master data management strategy.
- Data-based business rules for managing data and measuring data quality.

For more information about the PPDM Association visit www.ppdm.org.



INTRODUCTION

Ask ten times “What is a well?” and you might get ten different answers. People think of a well in terms of their workflows and experience. A reservoir engineer, production accountant, landman, field operator, business executive, and data manager all have different perspectives. Semantics (the contextual meaning of a word) can cause miscommunication within and beyond an organization.

To address this issue, a PPDM Association Work Group, sponsored by several operating companies and data vendors, has created baseline definitions for important well components. These definitions have become the foundation to analyze the terminology used by regulatory agencies around the world.

This booklet presents the baseline definitions for the Well Components across the Well life cycle. Visit the PPDM website, whatisawell.org, and go to the “What is a Well?” section for detailed information.



BECOME A PPDM MEMBER

One membership fee; over \$100 million worth of knowledge. Now that's ROI.

Members of the **Professional Petroleum Data Management Association** get immediate access to a wealth of tools and knowledge in the field of oil and gas data management standards, best practices, and education, including:

- **Standards**
- **Business rules**
- **Knowledge sharing**
- **Quarterly subscription to *Foundations***

Membership in the PPDM Association is one of the best investments you can make. For more information on membership packages, visit us online at ppdm.org.

Suite 860, 736 8th Ave SW
Calgary, AB T2P 1H4 Canada
Email: info@ppdm.org
Phone: 403-660-7817



Guidance

The definitions describe the physical and logical concepts of a Well as an asset. They are not intended to substitute for business rules or application, process or organizational constraints.

To adopt these definitions, you should document the rules for relating them to your Well Components. The rules criteria should be specific, measurable, objective and reproducible.

These definitions provide a baseline to analyze your use of a term or concept and explain any difference. This should improve communication and may prevent errors during activities such as acquiring or exchanging data. In the same way, the baseline definitions help in analyzing the meanings used by regulators, partners, data vendors, etc.

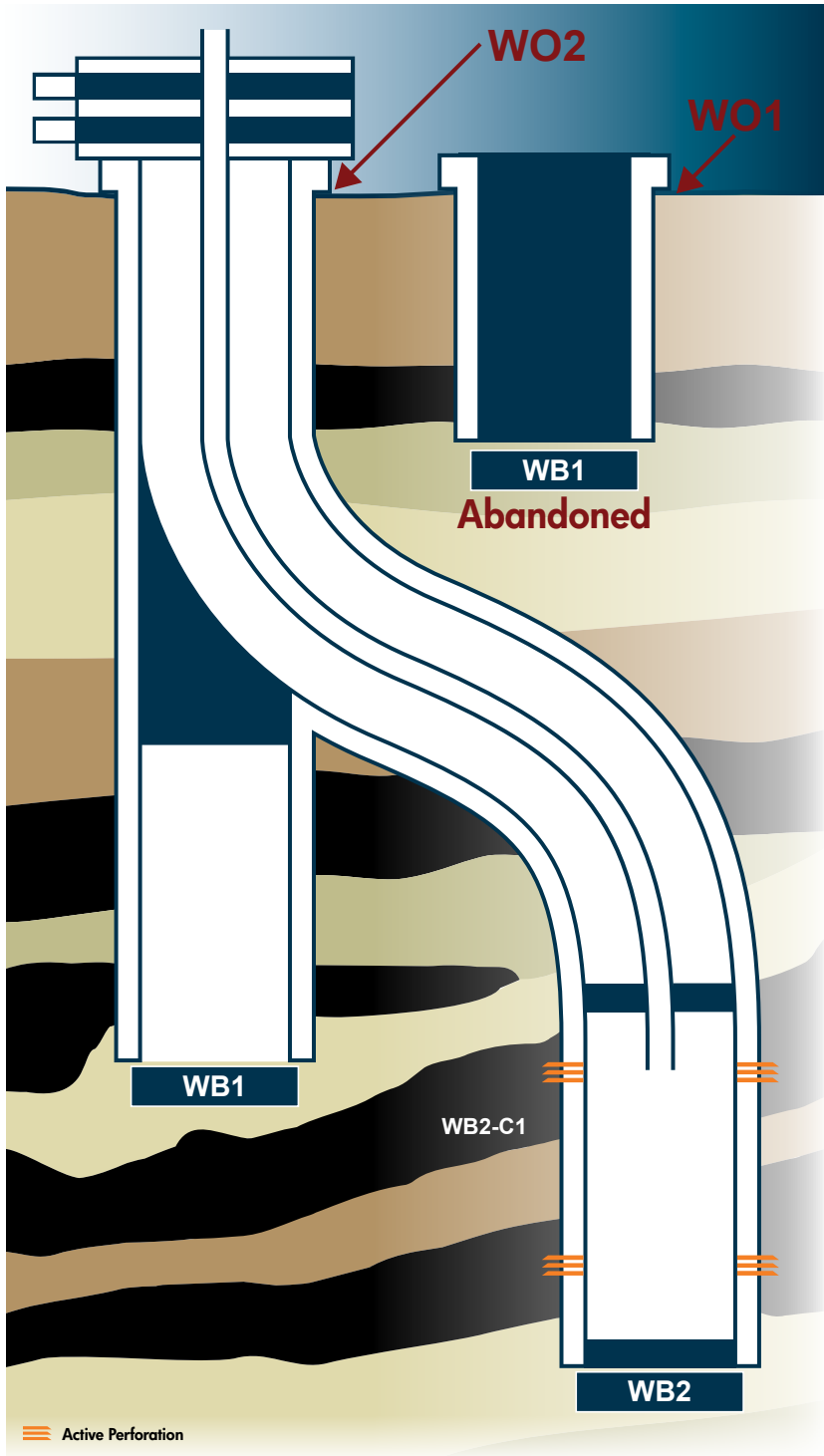
JOIN THE CONVERSATION!

The PPDM Association hosts a number of global events on an annual basis. These Conferences, Luncheons and Training Classes are designed to facilitate a collaborative, open industry forum to discuss current issues in data management and standards and to showcase industry success stories. We invite you to participate in the next PPDM Association event and join the conversation.

For more details on an event near you visit www.ppdm.org/events



WELL SET



WELL SET



Definition:

A Well Set is a grouping mechanism for Well Components used to maintain an end-to-end link through all stages of the Well life cycle (planning to disposal).

Key Concept(s):

A grouping mechanism.

Clarification:

A Well Set will contain one parent Well and its components, and may also contain associated Wells (and their components) drilled for the purpose of re-entry, skidding, relief or service specific to the parent Well's operation.

The Well Set can include both planned and actual Wells.

Well Set allows a connection of all of the Well Components created over the life of a Well, even if they do not get beyond the planning stage, or are not physically connected to the same Well Origin.

Diagram Note:

The Well Set depicted on page 1 groups multiple Well Components, including: one Abandoned Well Origin (WO1), one active Well Origin (WO2), two plugged Wellbores (WO1-WB1, WO2-WB1), one active Wellbore (WB2), and one active Wellbore Completion (WB2-C1).

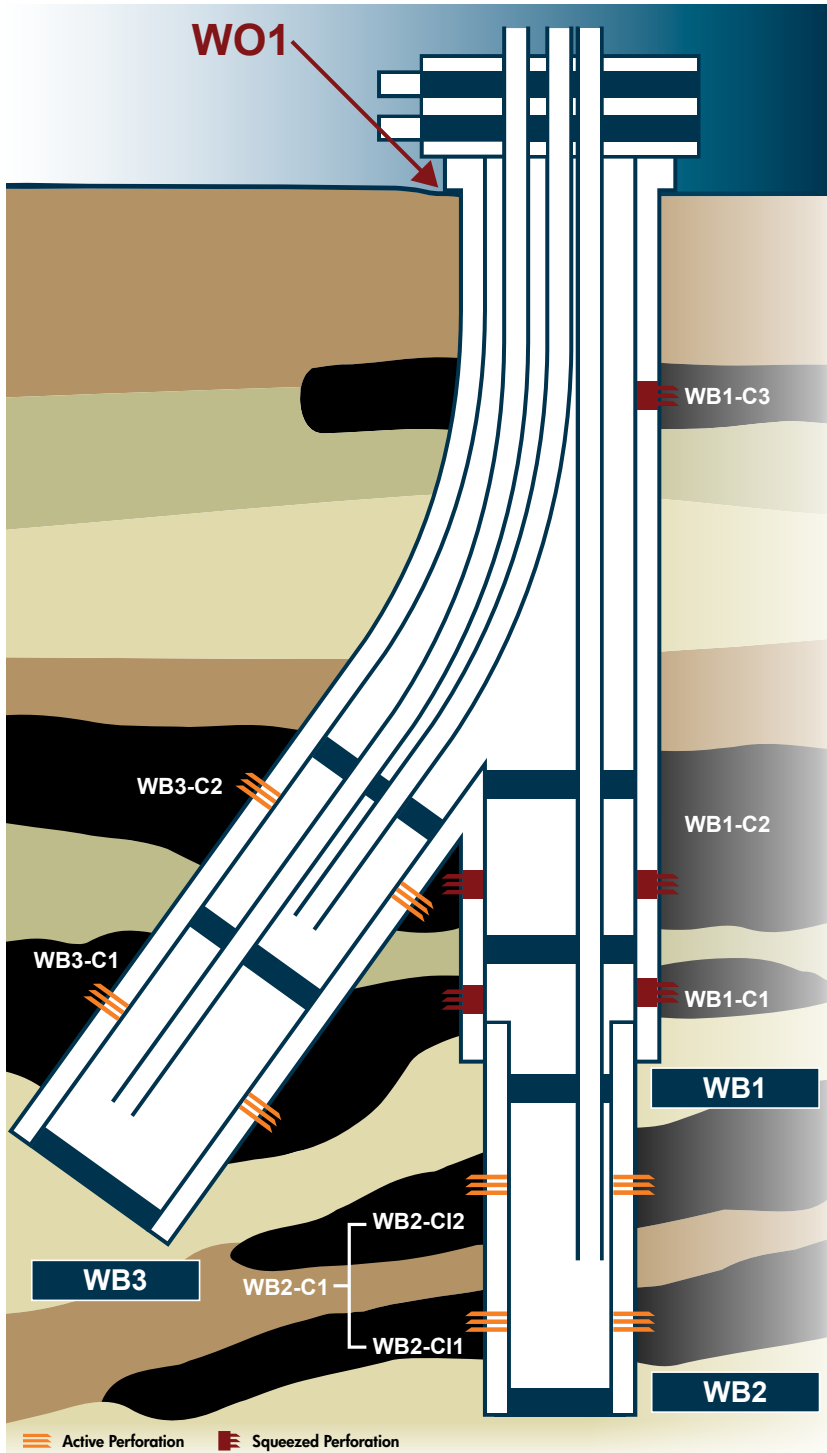
WO = Well Origin

WB = Wellbore

C = Completion

WB2-C1 = Wellbore #2 and Completion #1

WELL



WELL



Definition:

A Well is a permitted or actual drilled hole in the ground designed to exchange (or facilitate the exchange of) fluids between a subsurface reservoir and the surface (or another reservoir), or to enable the detection and measurement of rock properties.

Key Concept(s):

A physical Well is created each time the drill bit breaks the surface of the earth.

Clarification:

A Well is the parent of the Wellhead Stream(s), Well Origin, and all Well Components down hole from its Well Origin.

A Well has a single Well Origin and all Wellbore(s) that extend from this Well Origin are parts of the Well.

Re-entry through the same Well Origin for a Well that has not been plugged and abandoned does not create a new Well.

A Well that has the same geographic coordinates as a previously existing plugged and abandoned, reclaimed or undrilled Well is a new Well.

Diagram Note:

The Well depicted on page 3 groups multiple Well Components, including: one active Well Origin (WO1), one inactive Wellbore (WB1), two active Wellbores (WB2, WB3), three inactive Wellbore Completions (WB1-C1, WB1-C2, WB1-C3) and three active Wellbore Completions (WB2-C1, WB3-C1, WB3-C2) and two active Wellbore Contact Intervals (WB2-C1, WB2-C12).

Visit The PPDM Association Website www.ppdm.org

Did you know you can become a member, find an event near you, register for training and explore the forums JUST by logging onto the PPDM Association website? If you are not a member yet, create a Guest or Student account to find out more! All the information you need is one click away:

- Front Page News
- Policies
- Upcoming Events
- Certification and Training
- Work Group Initiatives
- Member Information
- Forums

petroWEB | ENTERPRISE DB

Reduced risk & cost

Better data

Better decisions

Better results

petroWEB
www.petroweb.com



For additional information contact info@petroweb.com



Managing Data and Information Across the E&P Value Chain

DataCo

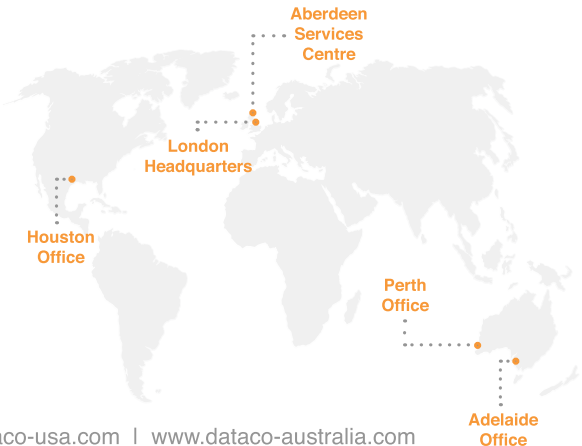
Providing data and information management services to the upstream Oil and Gas industry

Our Services

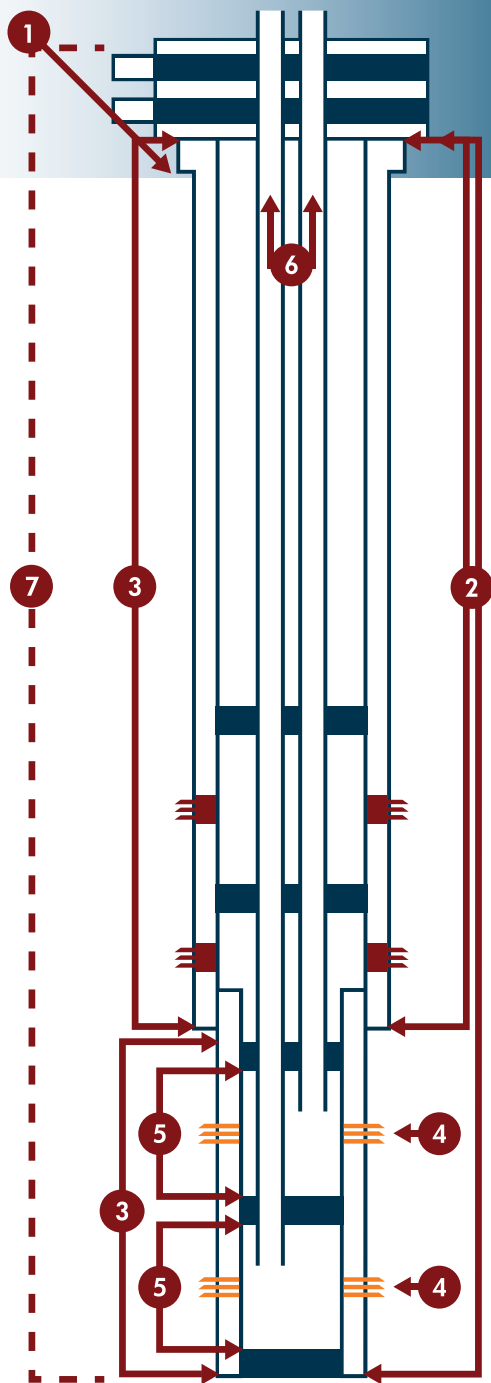
- Consultancy
- Solution Delivery
- Technical Support
- Managed Services

DataCo

www.dataco.co.uk | www.dataco-usa.com | www.dataco-australia.com



WELL COMPONENTS



≡ Active Perforation

≡ Squeezed Perforation



PPDM™

WELL COMPONENTS



1. Well Origin (WO)

A Well Origin is the location on the surface of the earth or sea bed where the drill bit is planned to penetrate or does penetrate the earth to establish or rework a Well.

2. Wellbore (WB)

A Wellbore is a path of drilled footage, from the Well Origin (top/start) to a terminating point (bottom/end).

3. Wellbore Segment (WS)

A Wellbore Segment is a unique drilled interval within the Well, either the original Wellbore from the Well Origin to the terminating point, or additional footage from a point in an existing Wellbore to a new terminating point.

4. Wellbore Contact Interval (CI)

A Wellbore Contact Interval is a measured depth range within a Wellbore that is intended to put the Wellbore into contact with one or more stratigraphic zones for the purpose of production, injection or service.

5. Wellbore Completion (C)

A Wellbore Completion is a set of one or more Wellbore Contact Intervals that function as a unit to produce or inject fluids.

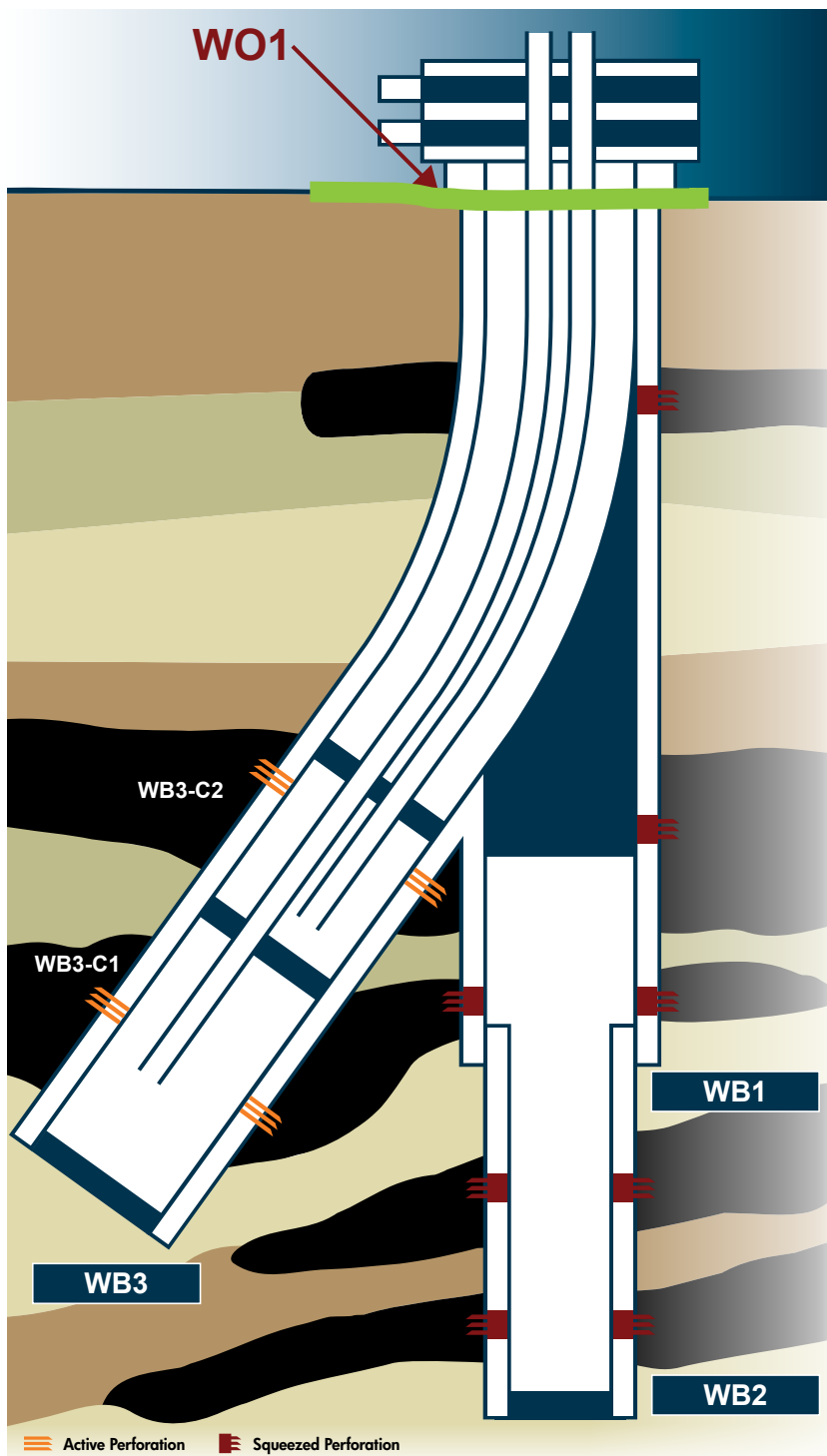
6. Wellhead Stream (WHS)

A Wellhead Stream is a flow of fluids through a conduit determined by an installed wellhead configuration.

7. Well Reporting Stream (WRS)

A Well Reporting Stream is a derived stream of fluids to support the allocation and aggregation of volumes.

WELL ORIGIN



WELL ORIGIN



Definition:

A Well Origin is the location on the surface of the earth or sea bed where the drill bit is planned to or does penetrate the earth to establish or rework a Well.

Key Concept(s):

Every Well has one real, physical Well Origin.

Clarification:

A Well has only one valid Well Origin at any point in time. A Well Origin is associated with one Well, and all Wellbores and other Components that are part of that Well.

The location of a planned Well Origin can change or be inexact. Once the drill bit hits the ground, the location is fixed.

A new Well gets a new Well Origin.

Diagram Note:

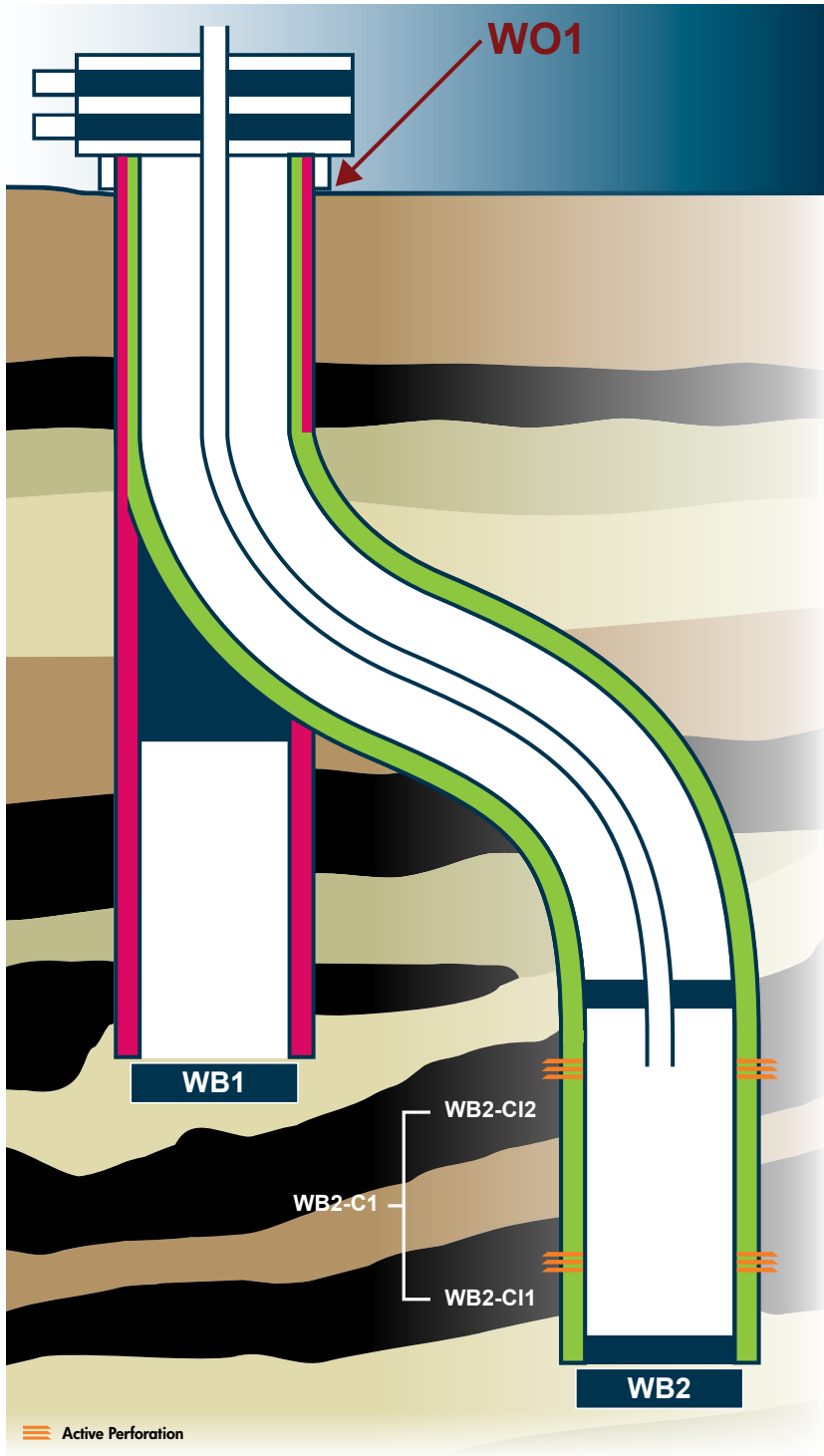
The Well depicted on page 9 shows multiple Well Components, including: one active Well Origin (WO1), two plugged Wellbores (WB1, WB2), one active Wellbore (WB3), and two active Wellbore Completions (WB3-C1, WB3-C2).

WO = Well Origin

WB = Wellbore

C = Wellbore Completion

WELLBORE



WELLBORE



Definition:

A Wellbore is a path of drilled footage, from the Well Origin (top/start) to a terminating point (bottom/end).

Key Concept(s):

Wellbores do not need to be drilled in one continuous operation; they are defined as a path from the Well Origin to a terminating point.

Clarification:

There are one or more Wellbores in a planned or drilled Well, namely the original Wellbore, and a Wellbore for each intended, actual or accidental sidetrack. Each Wellbore has a unique terminating point.

A deepening of an existing Wellbore is considered a new Wellbore with the same Well Origin. Note that in this case, the original terminating point will be located within the new Wellbore.

Widening of an existing Wellbore does not constitute a new, separate Wellbore.

Diagram Note:

The Well depicted on page 11 shows multiple Well Components, including: one active Well Origin (WO1), one plugged Wellbore (WB1), one active Wellbore (WB2), one active Wellbore Completion (WB2-C1) and two active Wellbore Contact Intervals (WB2-CI1, WBC-CI2).

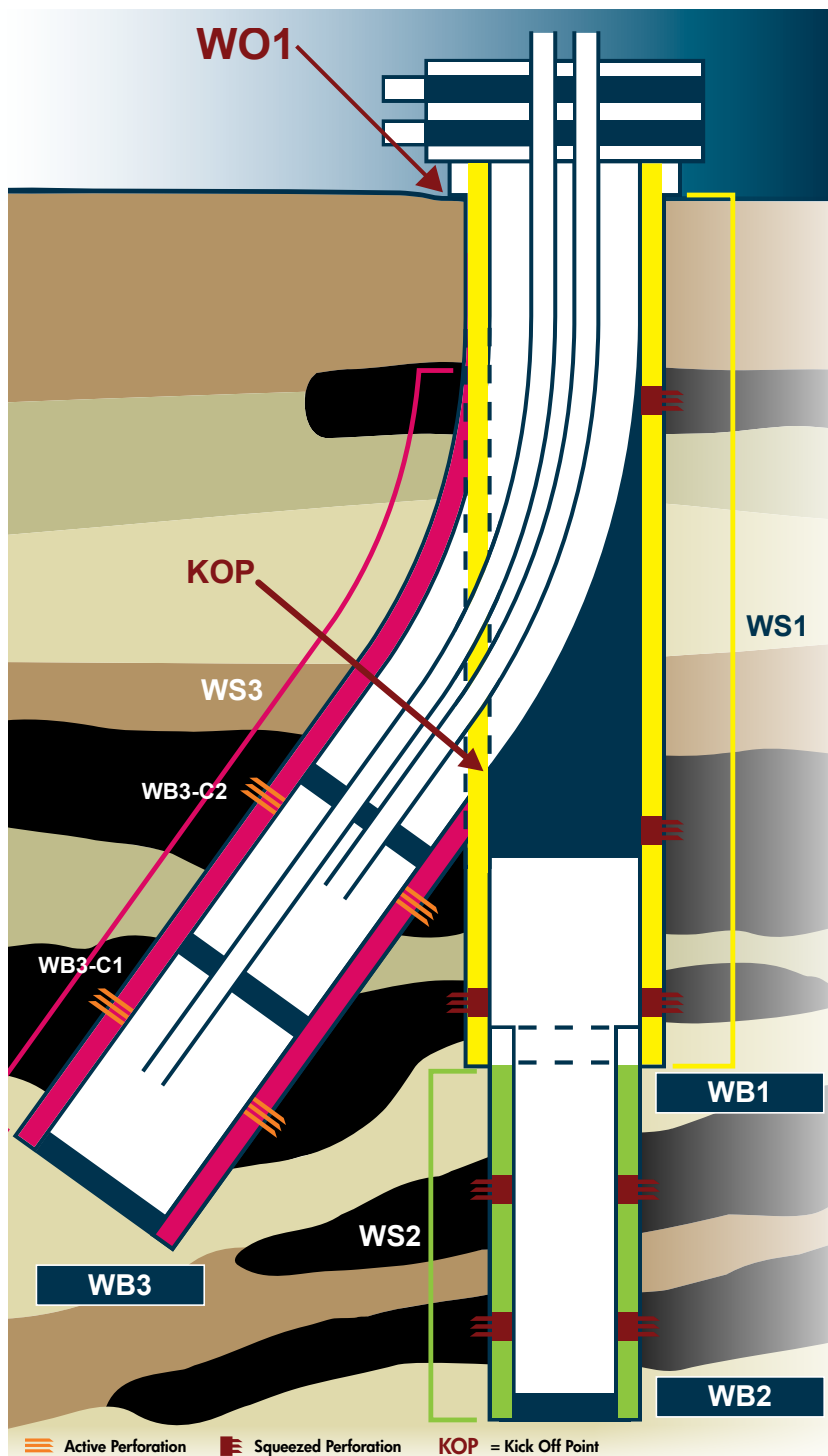
WO = Well Origin

WB = Wellbore

C = Wellbore Completion

CI = Wellbore Contact Interval

WELLBORE SEGMENT



WELLBORE SEGMENT



Definition:

A Wellbore Segment is a unique drilled interval within the Well, either the original Wellbore from the Well Origin to the terminating point, or additional footage from a point in an existing Wellbore to a new terminating point.

Key Concept(s):

A Wellbore Segment is a unique drilled interval, with no overlap.

Every point in a Well is in one and only one Wellbore Segment.

Clarification:

A Wellbore Segment is generally drilled in one continuous operation.

The starting point of a new Wellbore Segment is a point in an existing Wellbore from which additional footage is drilled. This point may be a kickoff or sidetrack point or the original terminating point of the original Wellbore, as in a deepening.

The total drilled footage in a Well is the sum of all the Wellbore Segment lengths.

Because Wellbore Segments are based on drilling, Wellbore Segments should not be created to define operational intervals, such as logged, cored, tested, contact, completed or other intervals.

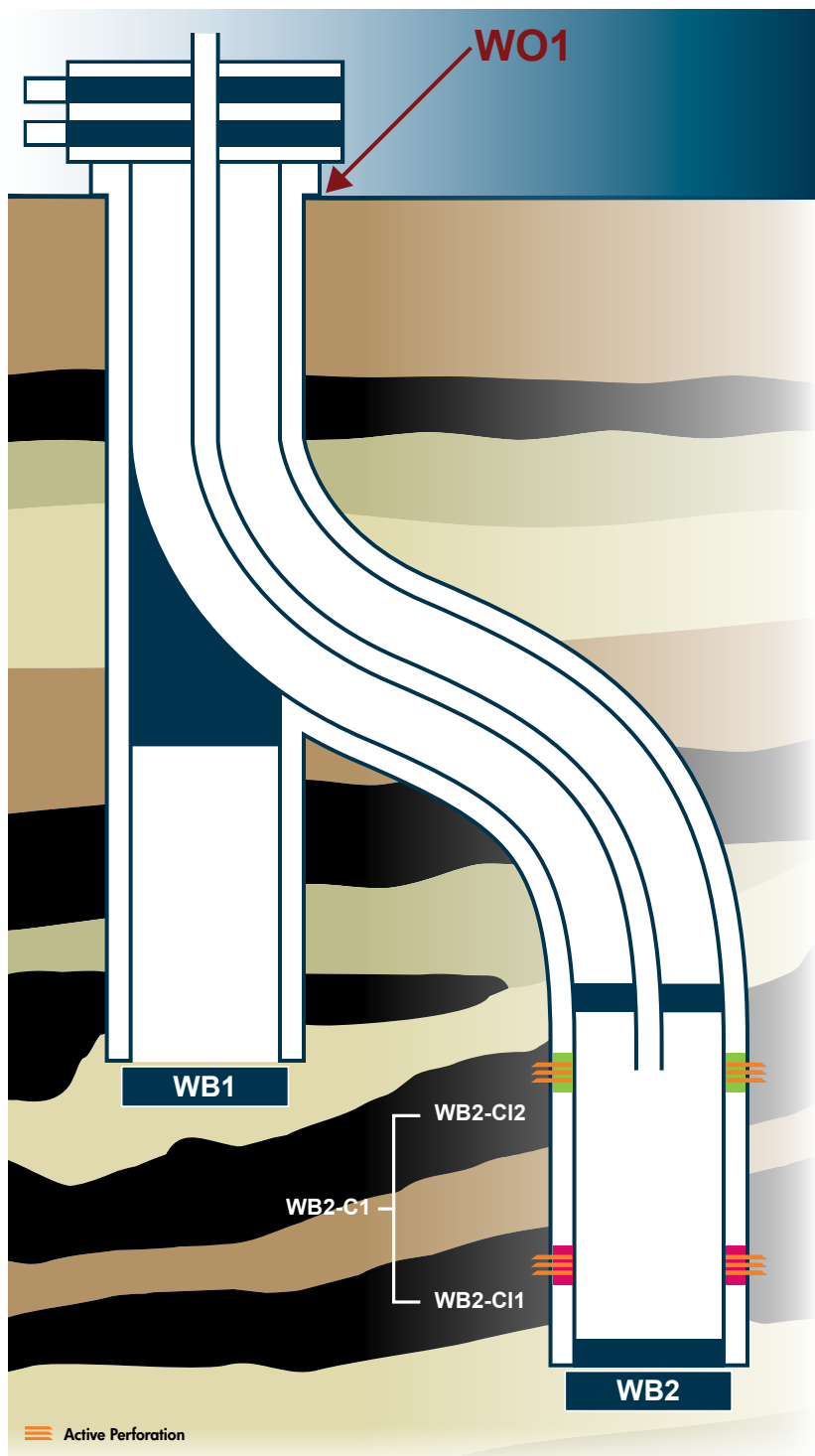
A Wellbore is made up of portions of one or more Wellbore Segments. A Wellbore Segment can be part of more than one Wellbore.

Wellbore Segments may be planned or actual; all Wellbore Segments may be described, even though they are not recorded or reported, depending on your requirements.

Diagram Note:

The Well depicted on page 13 shows three Wellbore Segments (WS1, WS2, WS3)

WELLBORE CONTACT INTERVAL



WELLBORE CONTACT INTERVAL



Definition:

A Wellbore Contact Interval is a measured depth range within a Wellbore that is intended to put the Wellbore into contact with one or more stratigraphic zones for the purpose of production, injection or service.

Key Concept(s):

A physical section of a Wellbore allowing fluid flow through the wall of the Wellbore.

Clarification:

A Wellbore Contact Interval is created by a sequence of actions including (but not limited to) completion, recompletion, perforation or frac jobs. Perforation intervals, open hole intervals, slotted liner intervals, or a combination of these, are examples of Wellbore Contact Intervals.

Unlike a Wellbore Completion, an individual Wellbore Contact Interval need not be capable of isolating fluid flow.

A Wellbore Contact Interval is contained in only one Wellbore Completion at any point in time, although it might be contained in different Wellbore Completions over the life of the Wellbore Contact Interval.

A Wellbore Contact Interval must not be associated with more than one Wellbore Completion at any one time but may exist, at least temporarily, without a Wellbore Completion.

The life of a Wellbore Contact Interval may be shorter than the entire life of a Wellbore.

Diagram Note:

WB = Wellbore

C = Wellbore Completion

CI = Wellbore Contact Interval

WB2-CI1 = Wellbore #2 and Contact Interval #1



WELLBORE COMPLETION



Definition:

A Wellbore Completion is a set of one or more Wellbore Contact Intervals that function as a unit to produce or inject fluids.

Key Concept(s):

A Wellbore Completion is capable of isolating a fluid flow for continuous measurement.

A Wellbore Completion is not an activity or a state but a physical configuration.

Clarification:

A Well may have zero, one or more Wellbore Completions.

A Wellbore Completion can span multiple Wellbores or Wellbore Segments.

A Wellbore Completion may span multiple reservoirs, and a single reservoir may exchange fluids with multiple Wellbore Completions.

Diagram Note:

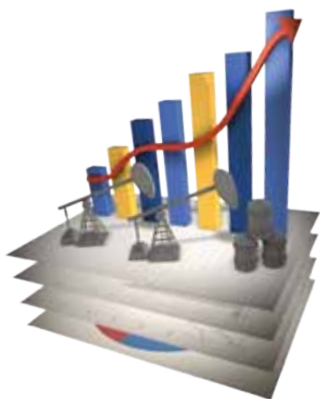
WB = Wellbore

C = Wellbore Completion

WB1-C1 = Wellbore #1 and Completion #1




WB2-C1 = Wellbore #2 and Completion #1

WB2-C2 = Wellbore #2 and Completion #2



EPIC

ENERGY *PERFORMANCE* INSIGHT CENTER

-  Manage Risk
-  Understand Operating Cost
-  Access Industry Intelligence

Information management tools and portal solutions to maximize your investment in PPDM.

Strategic Computing, Inc. (SCI) providing E&P software solutions since 1993.



www.scicomputing.com



303.796.0748

SUPPORT Foundations

The Journal of the Professional Petroleum
Data Management Association

Foundations offers feature articles, profiles and technical updates that provide industry news and insight into key issues and initiatives in the E&P data management industry.

Placing an ad in **Foundations** will put your message directly in front of senior managers and key decision makers in E&P companies worldwide.

Showcase your company with advertising in **Foundations**.



PPDM™

www.ppdm.org



For information
about advertising in
Foundations, contact:

Elise Sommer
Phone: (403) 660-7817 ext 506
Email: sommere@ppdm.org

Do Your Partners and Vendors Speak Different Languages?



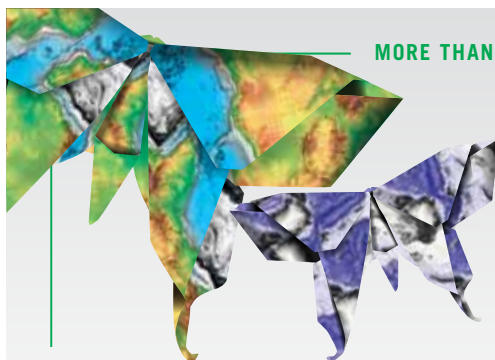
**An Open Data Exchange Standard
for the Digital Oilfield**

*Embedded in over
40 software products...
Used by over 100 oil and gas
companies globally...*



www.energistics.org

Upstream Standards. Bottom Line Results.



MORE THAN MAPPING

COULD YOUR DATA MANAGEMENT USE A METAMORPHOSIS?

Evolve your business. Optimize quality and performance with Petrosys.

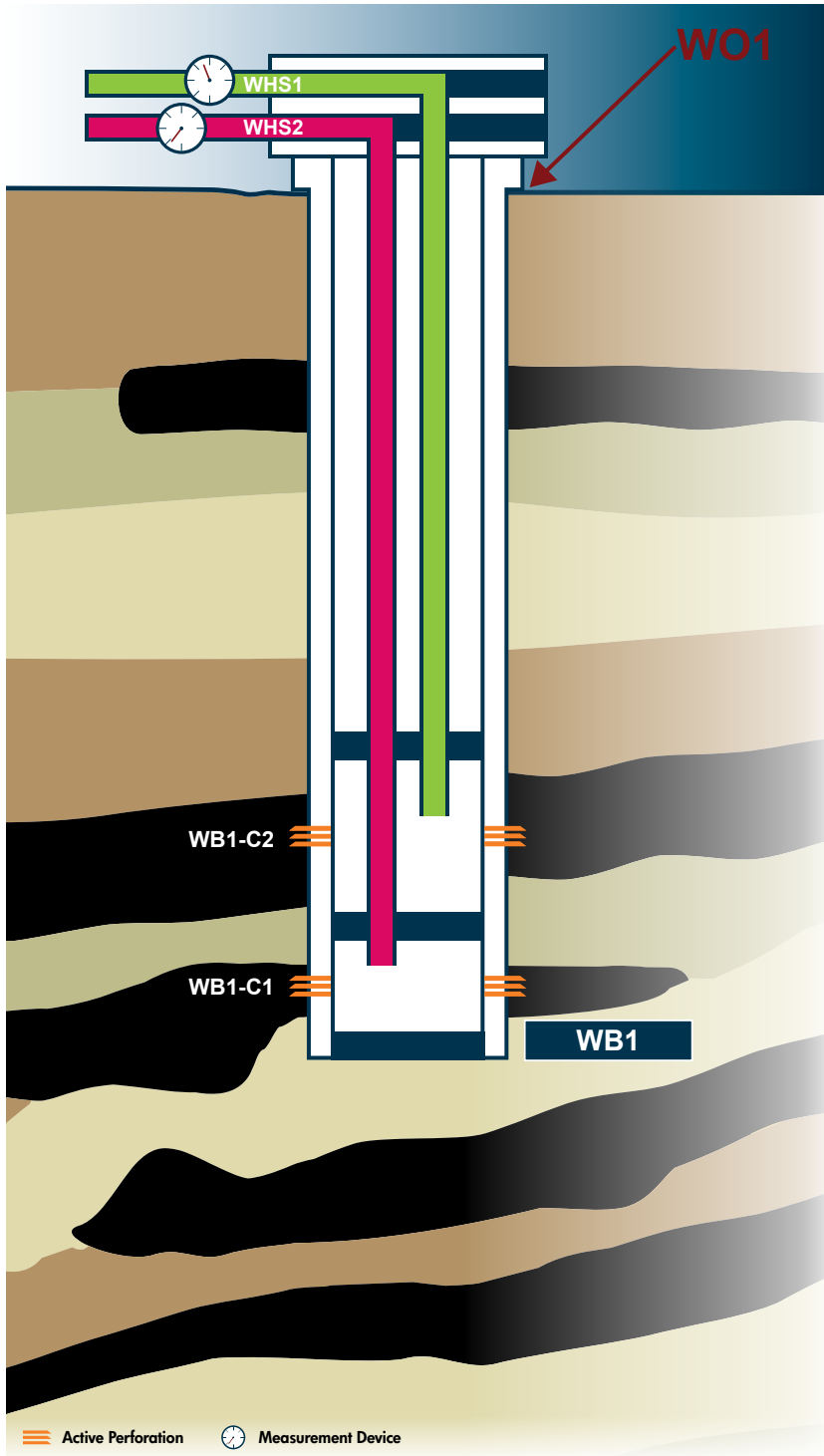
SOFTWARE SERVICES CONNECTIVITY DATA MANAGEMENT

Quality and availability of data is crucial to effectively managing your assets. Let the Petrosys team of industry experts unfold a pragmatic data management plan for your organization; delivering critical data to asset teams at the time and in the format that they need it. Fast and reliable access to data – stored centrally in your master repository based on the PPDM model – will have you refining knowledge and making decisions more quickly.

Learn more at www.petrosys.com.au/product-info/data-management.



WELLHEAD STREAM



WELLHEAD STREAM



Definition:

A Wellhead Stream is a flow of fluids through a conduit determined by an installed wellhead configuration.

Key Concept(s):

The Wellhead Stream represents what is coming in or out of the ground at the Wellhead.

Clarification:

A Wellhead is the equipment used to maintain surface control of a Well.

A Well can have zero, one or more Wellhead Streams.

A Wellhead Stream conducts fluids to or from one or more Wellbore Completions.

Diagram Note:

The Well depicted on page 21 shows multiple Well Components, including: one active Well Origin (WO1), one active Wellbore (WB1), two active Wellbore Completions (WB1-C1, WB1-C2) and two Wellhead Streams (WHS1, WHS2).

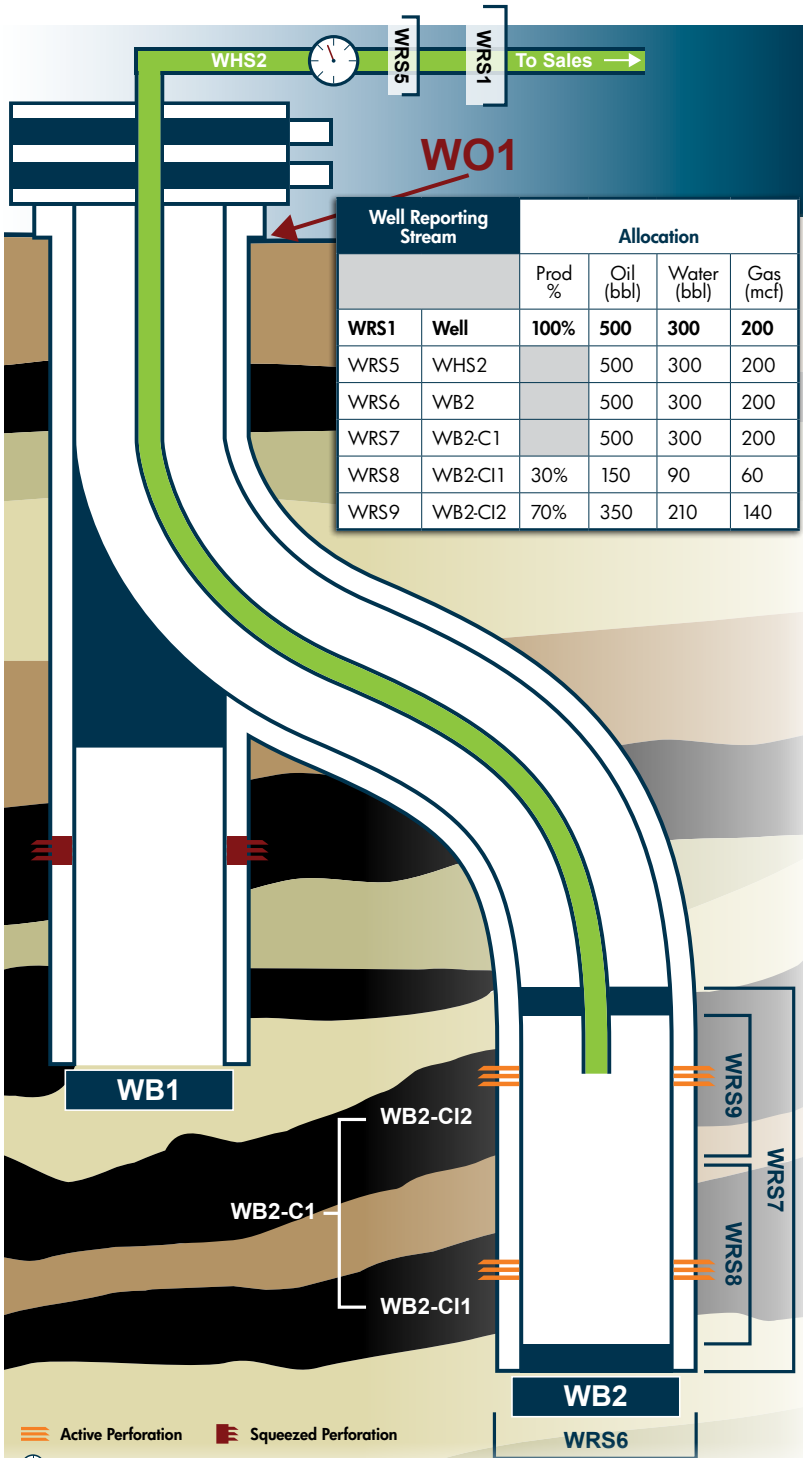
WO = Well Origin

WB = Wellbore

C = Wellbore Completion

WHS = Wellhead Stream

WELL REPORTING STREAM



WELL REPORTING STREAM



Definition:

A Well Reporting Stream is a derived stream of fluids to support the allocation and aggregation of volumes.

Key Concept(s):

Well Reporting Streams may be measured, estimated or calculated.

Clarification:

Any Well Component or group of Well Components (including other Well Reporting Streams) can be associated with a Well Reporting Stream.

In certain cases, allocations may initiate from a measurement point that is outside the Well Set (such as a facility or metering station).

Diagram Note:

The Well depicted on page 23 shows multiple Well Components, including: one active Well Origin (WO1), one plugged Wellbore (WB1), one active Wellbore (WB2), one active Wellbore Completion (WB2-C1), one Wellhead Stream (WHS2), and six Well Reporting Streams (WRS1, WRS5, WRS6, WRS7, WRS8, WRS9).

WO = Well Origin

WB = Wellbore

C = Wellbore Completion

CI = Contact Interval

WHS = Wellhead Stream

WRS = Well Reporting Stream

This example illustrates a well configuration where volumes are allocated from a single Wellhead Stream to separate intervals in a Wellbore Completion. Gaps in Well Reporting Stream numbering indicates a retirement of Well Reporting Streams, 2-4 which occurred when the first Wellbore (WB1) was plugged.



WELL REPORTING STREAM



Diagram Note:

The Well depicted on page 25 shows multiple Well Components, including: one active Well Origin (WO1), one inactive Wellbore (WB1), two active Wellbores (WB2, WB3), three active Wellbore Completions (WB2-C1, WB3-C1, WB3-C2), three Wellhead Streams (WHS1, WHS2, WHS3), and fourteen Well Reporting Streams (WRS1, WRS2, WRS3, WRS4, WRS5, WRS6, WRS7, WRS8, WRS9, WRS10, WRS11, WRS12, WRS13, WRS14).

WO = Well Origin

WB = Wellbore

C = Wellbore Completion

WHS = Wellhead Stream

WRS = Well Reporting Stream

This example illustrates a well configuration where volumes are allocated from multiple Wellhead Streams to the Wellbore Completions in the Well.

Well Reporting Stream		Gas Allocation				
		WHS			WB	WBC
		Prod %	Gas (mcf)	Gas (mcf)	Gas (mcf)	Gas (mcf)
WRS1	Well	100%	9500	9500	9500	9500
WRS2	WHS1	40%	3800	3800		
WRS3	WB1				0	
WRS4	WB1-C1					0
WRS5	WB1-C2					0
WRS6	WB1-C3					0
WRS7	WB2				3800	
WRS8	WB2-C1					3800
WRS9	WHS2	25%	2375			
WRS10	WB3				5700	
WRS11	WB3-C1					3325
WRS12	WHS3	35%	3325			
WRS13	WB3-C2					2375
WRS14	WHS2 + WHS3			5700		

Warning: Our data has gone mobile

(You may never return to the office)



Now, get geoLOGIC's value added data almost any place, any time, any way you want it. Available through gDCweb on your tablet, smartphone, or computer.

With 30 years of data experience behind it, the gDC is the source for high quality, value-added well and land data from across Western Canada. Another plus - our data is accessible through an expanding range of industry software utilizing our own easy-to-use gDC GIS and our geoSCOUT software.

View, search, import and export well, land and production data, documents, logs and more from almost anywhere. For more information, visit our website at www.geoLOGIC.com.



Leading the way with customer-driven data, integrated software, and services for your upstream decision-making needs.

geoSCOUT | gDC | petroCUBE
at www.geoLOGIC.com