



Well Testing and Reporting Requirements Guide

VERSION 2.2: May 2019

Introduction

Well test data is fundamental to the understanding and effective management of oil and gas wells and pools. Timely, comprehensive collection and dissemination of well testing data is a key mandate of the Commission. Reservoir pressure test data is utilized for a variety of purposes; pool mapping, well classification, reserves determination and the regulation and calculation of disposal capacity. Well flow tests provide detailed early production characteristics.

This document provides assistance in understanding and complying with the BC Oil and Gas Commission (the Commission)'s well testing and reporting requirements.

Additional Guidance

As with all Commission documents, this guide does not take the place of applicable legislation. Readers are encouraged to become familiar with the acts and regulations and seek direction from Commission staff for clarification. Some activities may require additional requirements and approvals from other regulators or create obligations under other statutes. It is the applicant and permit holder's responsibility to know and uphold all legal obligations and responsibilities.

Throughout the manual there are references to guides, forms, tables and definitions to assist in creating and submitting all required information. Additional resources include:

- [Glossary and acronym listing](#) on the Commission website.
- [Documentation and guidelines](#) on the Commission website.
- [Frequently asked questions](#) on the Commission website.
- [Advisories, bulletins, reports and directives](#) on the Commission website.
- [Regulations and Acts](#) listed on the Commission website

Guidelines can be obtained from the [Reservoir Engineering – Well Testing](#) section of the Commission's website. Additional information is also available at this site on topics such as Modification of Annual Pool Testing Requirements and Pools with Non-Annual Testing Approval.

Contact Us

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Document Revisions

The Commission is committed to the continuous improvement of its documentation. Revisions to the documentation are highlighted in this section and are posted to the [Documentation Section](#) of the Commission's website. Stakeholders are invited to provide input or feedback on Commission documentation to OGC.Systems@bcogc.ca or submit feedback using the [feedback form](#).

Version Number	Posted Date	Effective Date	Chapter Section	Summary of Revision(s)
2.2	May 8, 2019	June 1, 2019	Various	<p>Various changes have been made to this document, as such users are encouraged to review in full.</p> <p>To note: information on reservoir pressure testing requirements for water source and water disposal wells has been added.</p> <p>Also, added a new section regarding DFIT submission requirements, and a new section for Commingled Clean-up.</p> <p>Information regarding the Application Guideline for Exemption of Initial or Annual Pool Pressure Testing Requirements has also been incorporated.</p>

Chapter 1: Reservoir Pressure Survey Tests

Reservoir pressure measurements are required on all producing oil and gas pools, in accordance with [Section 73](#) of the [Drilling and Production Regulation](#) (DPR). The Commission reserves the right to order additional tests other than the outlined minimum requirement. Reservoir pressure tests, both initial and annual, are also required for disposal wells, as a condition of the approval Order; further information is available in the Water Disposal Wells section of the [Water Service Wells Summary Information Document](#).

Reservoir pressures are used for pool mapping, well classification, reservoir management and reserves. Good quality and accurate pressure testing and reporting is important.

1.1 Initial Pressure Testing

1. A well permit holder must ensure that the static bottom hole pressure of each completed zone of oil or gas wells is measured before initial production, disposal or injection.
2. Wells completed in an unconventional zone listed in [Schedule 2](#) do not require an initial bottom hole pressure if a valid pressure measurement from the same unconventional zone within a 4km radius (distance measured from the well head) is publically available.

1.2 Annual Pressure Testing

1. A well permit holder must ensure that the static bottom hole pressure of each producing pool, each observation well, and each water source well accessing deep groundwater is measured once every calendar year.
2. Wells completed in an unconventional zone listed in Schedule 2 are not subject to annual pressure testing requirements.
3. Disposal wells are subject to the reservoir pressure testing requirements outlined in the approval Order.
4. Initial pressure tests are credited toward the minimum annual testing requirement for a pool.
5. The Commission requires adequate pool pressure survey coverage. The minimum number of reservoir pressure tests to be conducted annually for each producing pool should be equal in number to:
 - a. Oil pools – a number equal to 25% of the producing and injecting wells within the pool. For mature pools with limited remaining active wells, the location of the test wells must be in close proximity to current production and injection activity.
 - b. Gas pools – a number equal to 25% of the total number of wells within the pool or 50% of the producing wells within the pool, whichever is less.

The Commission 'rounds up' to the next whole number when calculating the minimum number of pressure tests required. Single well pools require annual testing unless otherwise approved.

1.3 Assigned Coordinating Operators for Pool Pressure Surveys - Discontinued

1. A 'Coordinating Operator' was previously designated for pools having multiple operators. The coordinator, in conjunction with the other operators in the pool, was responsible for drafting a schedule to ensure that a comprehensive survey was carried out and the minimum testing requirements were met. The Commission has discontinued Table 2: Assigned Coordinating Operators for Pool Pressure Surveys due to declining activity levels in these pools.

1.4 Quality of Pressure Testing

1. A well permit holder must ensure that, when static bottom hole pressures are measured, the surveyed wells remain shut-in until the reservoir pressure has been attained in the well bore or until sufficient data are available to permit the calculation of the reservoir pressure.
2. A pressure transient analysis may be required in order to obtain a valid reservoir pressure.
3. Where insufficient shut-in time was allocated during a test to measure or extrapolate a reservoir pressure, the test may be deemed invalid and additional testing required.
4. The preferred method of determining a static bottom hole pressure is with a bottom hole recorder. Surface pressure tests are not considered valid for disposal wells unless approved by the Commission.
5. To ensure a good quality pressure measurement in a static gradient test a bottom stop of no less than two hours is recommended.
6. A valid diagnostic fracture injection test (DFIT) may meet initial pressure survey testing requirements, if a stabilized pressure is reached or if an analysis can confidently extrapolate a reservoir pressure.
7. Wells selected for reservoir pressure testing should offer good pool coverage. Plant shutdowns are an excellent time to collect annual pressure survey data.

1.5 Pressure Test Submissions

1. The static bottom hole pressure and duration of resulting shut-in time must be reported to the Commission within 60 days after the date on which the operation concluded.
2. Pressure testing to monitor inter-wellbore communication is considered well data and must also be submitted to the Commission within 60 days of the end of the test.
3. All pressure tests are to be submitted through [eSubmission](#) as described in section 3.6 of the [eSubmission User Guide](#).
4. Well test data submissions made through eSubmission must be comprised of one PAS file and one or more PDF files. A separate submission is required for each PAS file.
5. Only tests conducted using surface recorders may be submitted using the TRGS submission type. The eSubmission portal will accept a TRGS submission without a raw data file; however, if available, a PAS or CSV file of the raw data must be submitted to the Commission.

6. If a bottom hole pressure calculation has been done, comprehensive details of the data and calculations must be included in the submission.
7. For pressure build-up or fall-off data which include an analysis, submissions must include the following:
 - a. Raw pressure data,
 - b. A plot of the entire test (if converting RD to MPP, include calculation details),
 - c. A log-log diagnostic plot,
 - d. The extrapolation plot or pressure history matching plot, and
 - e. A statement regarding the analyst's confidence level regarding the results.
8. Pressure transient analyses for disposal wells must report a 60 day pressure extrapolation. For further information please see the [Water Service Well Summary Information](#) document.
9. When available, the pressure transient analysis is to be submitted with the PDF and PAS file of the corresponding test report; as a single submission. For example, a TRG submission would be comprised of:
 - a. one PDF containing the analysis,
 - b. one PDF containing the test report with raw pressure data, and
 - c. one PAS file of containing the raw data.

1.6 DFITs

1. When conducted, DFITs must be submitted to the Commission within 60 days of the end of the test.
2. DFITs are submitted as a TRGS submission in eSubmission. At a minimum, the submission must be comprised of an analysis in PDF format and a raw data file in CSV or PAS format.
3. The raw data submission must include pressure data and injection volumes and rate.
4. The DFIT analysis must include the following:
 - a. A plot of the entire test (if converting from surface pressure or run depth to MPP, include calculation details),
 - b. A G-Function plot indicating closure pressure, closure time and a primary pressure derivative.
 - c. A pre-closure flow regime analysis, including closure pressure gradient (kPa/m), closure time, ISIP and ISIP gradient (kPa/m)
 - d. After closure analysis including a log-log diagnostic plot, and a valid pressure extrapolation plot indicating reservoir pressure and skin
 - e. A statement regarding the analyst's confidence level regarding the results.
5. The analysis is to be submitted with any additional PDFs and the PAS of CSV file of raw data as a single submission.

1.7 Pressure Testing Exemptions

1. Initial reservoir pressure testing of a well or annual reservoir pressure testing of a pool may be exempted under Section 4(1)(z), in cases where an alternative well provides a measure of the current reservoir pressure, where an adequate pressure history exists, wells have low productivity, and/or there are limited remaining reserves.

2. Annual testing requirements may be modified to an interval of two or more years, or a total exemption may be granted.
3. Listings of pools with non-annual pressure survey approval and pools where a coordinating operator has been assigned are available in [Table 1: Pools with Non-Annual Pressure Survey Approval](#).
4. Applications for exemption should be addressed to the Reservoir Engineering Department of the Commission and emailed to reservoir@bcogc.ca. The application should be made in PDF format and include, where applicable:
 - a. a reference location map,
 - b. a tabular pressure history for each well in the pool,
 - c. a graphical pressure history for the pool,
 - d. a production rate history by well/pool,
 - e. the reserves and cumulative production for the pool,
 - f. letters of support from other pool operators, and
 - g. proposal for modified testing

Chapter 2: Well Flow Tests

Well flow tests are considered any situation where mobile test equipment is employed and field notes are generated. This includes both oil and gas wells flowed through testers for an initial period following hydraulic fracture stimulation. Test field notes contain measurements of fluid rates and flowing pressure valuable to the determination of well stimulation effectiveness and production understanding.

Absolute open flow (AOF) potential tests are required for only certain gas wells, in accordance with [Section 63](#) of the DPR. A well producing from an unconventional zone as defined by Schedule 2 of the DPR is exempt from the requirement to complete AOF testing.

The Commission reserves the right to order additional tests other than the outlined minimum requirement.

2.1 Production, Clean-Up and Inline Flow Testing

1. A well permit holder must submit any well flow test conducted; including clean-up tests where gas is flared, flowed inline, or a combination of flared and inline flow.
2. Any use of mobile testers requires a report to be submitted to the Commission.

2.2 Commingled Clean-Up

1. Commingled flow may be approved by the Commission during initial flow back where the primary product is water with limited gas and condensate/oil.
2. The flow and volume of each fluid must be reported to individual wells. The rates and volumes can be allocated to each well based on the best available information and estimates.
3. A PRD submission is required for each well. The information must contain allocated rates and volumes to avoid duplication of data.
4. Wells must be at approximately equal reservoir and flowing wellhead pressure, and isolated from one another once flow is ceased to avoid cross-loading if a pressure differential develops between wells.
5. Each well must have a dedicated test within 7 days of initial flow back. For further information please see the [Measurement Guideline for Upstream Oil and Gas Operations](#).

2.3 Flaring

1. If gas flaring is required, it must be done in accordance with [Part 7](#) of the DPR. For additional information please see the [Flaring and Venting Reduction Guideline](#).

2.4 Deliverability Tests

1. Before 6 months have elapsed after a permit holder has first placed a gas well on production, the permit holder must flow test the well and determine the absolute open flow (AOF) potential if:
 - a. The well is producing from a pool with suspected water drive, or
 - b. The well is classified as an exploratory outpost well or exploratory wildcat well.
2. The requirement for AOF testing does not apply to a well completed in an unconventional zone listed in Schedule 2.
3. Any AOF testing conducted must be submitted to the Commission within sixty days of the end of the test.
4. Specific analysis of AOF data should include the calculation of the wellhead and sandface AOF values at both stabilized and extended rate conditions.

2.5 Underbalanced Drilling

1. A detailed report of any underbalanced drilling that results in burnable gas to the surface must be reported to the Commission.
2. If underbalanced drilling operations result in gas being flared, a copy of the field notes recorded must be submitted to the Commission.

2.6 Flow Test Submissions

1. All well flow tests must be submitted to the Commission within 60 days of the date on which the operation concluded.
2. All flow test are to be submitted through [eSubmission](#) as described in section 3.6 of the [eSubmission User Guide](#).
3. Well test data submissions made through eSubmission must be comprised of one PAS file and one or more PDF files. The PDF file(s) must include the raw data and any analysis data.