

# Well Barrier Integrity Validation Reporting Guideline

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<b>Contact details</b>	Energy Division
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<b>Acronyms</b>	<b>Full form</b>
DPIR	Department of Primary Industry and Resources
NT	Northern Territory
SD	Senior Director Petroleum Operations
WBIV	Well Barrier Integrity Validation
WOMP	Well Operations Management Plan

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## 1. Purpose

This purpose of this guideline is to provide a documented, systematic, and consistent approach for the reporting of well barrier integrity validation for all petroleum wells in the Northern Territory (NT).

The reporting requirements stated in this guideline are based on 117 - Norwegian Oil and Gas Association recommended guidelines for Well Integrity (*Norwegian Oil and Gas 117*).

This guideline supports and provides additional details to the overarching NT Schedule of Petroleum Exploration and Production Requirements (*the Schedule*).

The guideline should also be used with the Code of Practice: Onshore Petroleum Activities in the NT (the Code) and other relevant guidelines, and industry best practices.

## 2. Scope of this guideline

The reporting of well barrier integrity validation to the NT Department of Primary Industry and Resources (DPIR) under the requirements of the Schedule.

Well barrier integrity validation is required on all petroleum wells in the NT. That is, any well that has an approved Well Operations Management Plan (WOMP) in place as required by Clause 301 of the Schedule.

## 3. Relevant legislation and code of practice

NT *Petroleum Act (the Act)*

NT Petroleum (Environment) Regulations (PER)

Northern Territory Schedule of Petroleum Exploration and Production Requirements (the Schedule)

Code of Practice: Onshore Petroleum Activities in the NT.

## 4. Well Barrier Integrity Validation Reporting

### 4.1. Department's engagement in relation to well barrier integrity reporting

As the Minister's delegate, the Energy Division of DPIR has the responsibility to provide advice on the construction, testing, operation, monitoring, maintenance and decommissioning of petroleum wells in the NT.

As part of this delegated responsibility, the Energy Division is committed to being responsive to titleholders' information needs during the well operations assessment and reporting process.

This includes engagement with the titleholders from their entry into the petroleum title area, through to commencement of regulated well activities, and barrier integrity validation reporting throughout the operational life of the well.

## 4.2. Background

As per Clause 302a of the Schedule, and in conjunction with Part B.4.1 of the Code, titleholders are required to report the validation of integrity of all barriers for petroleum wells constructed on their title(s).

A completed and/or revised Well Barrier Integrity Validation Report (WBIV) is required to be submitted to the Energy Division for acceptance on any occasion a titleholder validates, installs, replaces or modifies a well barrier, or identifies degraded performance from a barrier.

This will include but not be limited to operations being undertaken through any of the following:

- Well construction and suspension
- Any well intervention or workover, including but not limited to testing, hydraulic fracturing, data gathering, wireline or slickline work or any remedial work
- Validation of any barriers of suspended wells
- Well abandonment (decommissioning).

## 4.3. Reporting timeframes

The submission of a WBIV report is part of the WOMP, and is required to be submitted within 30 days on any occasion a titleholder validates, installs, replaces or modifies a well barrier, or identifies degraded performance from a well barrier

## 4.4. Minimum data and information required

The following minimum data is to be included in the new or revised WBIV report:

- The formation strength should be indicated for formation within the barrier envelopes.
- A stratigraphic column diagram extending from surface to total vertical depth of the well, which shows the aquifers and hydrocarbon bearing zones present as well as naming the different stratigraphic sections.
- Each barrier element in both barrier envelopes should be presented in a table along with its initial integrity-validation test results along with the dates on which the tests were conducted.
- Accurate true vertical and measured depths of all barrier elements are required to be presented.
- Details of the casing strings and primary cement sheaths deployed in the well should be included, specifically,
  - casing size, weight, grade and connection type
  - casing setting depth (TVD and MD)
  - top of cement in each annulus (TVD and MD).
- Details of permanent and temporary isolation barriers\*, specifically,
  - what type of barrier it is
  - depth to the top and bottom of a barrier (TVD and MD).

*\*except as specified for casing strings and primary cement sheaths.*
- The true vertical depth of the,
  - top of the shallowest hydrocarbon bearing zone
  - top and bottom of the aquifers identified in the well
- There should be separate fields for the following well information: installation, well name, well type, well status, well category, rev. no./date, prepared by and validated by/approved by.
- Include a Note field for important well integrity information such as validation methods e.g: CBL conducted etc.

The above information and data above have to be included in a well barrier diagram as per **Section 4.5**, which forms part of the WBIV report.

### 4.5. Well barrier diagram

A fully labelled version of a well barrier diagram similar to the example below is to be submitted for each well as part of the WBIV report.

Well information	
Installation:	xxxxx
Well no.:	xx/xx-xx
Well type:	e.g. Oil producer
Well status:	e.g. Operational
Revision no. / Date:	x      xx.xx.xxxx
Prepared:	xxxxx
Verified/Approved:	xxxxx
Well barrier elements	
Verification of barrier elements	
PRIMARY	
7" liner cement	xx bar with xx sg fluid Method: prognosed / measured TOC: xx mMD Method: volume control / logs e.g. CBL xx bonding at xx mMD
7" liner	xx bar with xx sg fluid
7" liner hanger packer	xx bar with xx sg fluid
9 5/8" casing between liner hanger packer and production packer	xx bar with xx sg fluid
Production packer	xx bar with xx sg fluid
Production tubing	xx bar with xx sg fluid
SCSSV	Inflow test to xx bar
SECONDARY	
9 5/8" casing cement	FIT to xx sg EMW. Method: prognosed / measured TOC: xx mMD above prod.packer / csg.shoe. Method: volume control / logs e.g. CBL xx bonding at xx mMD
9 5/8" casing	xx bar with xx sg fluid
9 5/8" casing hanger with seal assembly	xx bar with xx sg fluid
Wellhead / annulus access valve	xx bar with xx sg fluid
Tubing hanger with seals	xx bar with xx sg fluid
X-mas tree valves	xx bar with xx sg fluid
Reference / Disp. no.	Comments / Notes:
well integrity issues	
N/A	

Logo

**Note:** Include dates (where applicable) for the comments made for 'primary and secondary well barriers'. The well barrier diagram above has to be signed off by the person preparing it and the independent validator.

## 4.6. Independent validation

In accordance with Clause 103 of the Schedule, and before submission to the Department, the titleholder or the operator must have the WBIV certified by an independent and reputable validator.

The person or contractor doing independent validation should not be employed by the titleholder or operator, but can be engaged on a contractual basis. Note that the person or contractor must not be involved in other jobs or services relating to the well.

The person or contractor is also required to have necessary competence and ability, and access to data, in relation to the WBIV matters being validated, to arrive at an independent opinion on the matters.

When the WBIV is submitted, the following are required as part of independent validation:

- A cover letter of validation, written and signed off by the validator stating the scope of validation and process followed.
- Copy of independent validator's CV if not previously provided to DPIR.

## 4.7. Well integrity categorization

In the WBIV report, the titleholder is required to categorise the well as per the system described in section 4 of Norwegian Oil and Gas No 117 as presented below.

In addition, the submission must include the following:

- a full risk analysis on all barriers.
- a discussion on the level of risk resulting from any degraded or failed barriers.
- unless the well is categorised as 'Green', a brief description of planned future actions in order to return the well category to 'Green'.

**Note:**

*In cases where the WBIV declares a well category other than 'Green', within four weeks, the titleholder is required to submit a revised WOMP, detailing its plan and expected timeframe, to return the well category to 'Green'.*

Category	Principle
Red	One barrier failure and the other is degraded/not verified, or leaking to surface.
Orange	One barrier failure and other is intact, or a single failure may lead to leak to surface.
Yellow	One barrier degraded, other is intact.
Green	Healthy well – no or minor issue.

## 5. Publication on department's website

The independently validated WBIV will be published on DPIR's website. Any information considered as commercially sensitive have to be removed.

In addition, ensure that all internal approvals have been obtained for DPIR to publish the WBIV prior to submission.

## 6. Related documents

Norwegian Oil and Gas Association recommended guidelines for Well Integrity No 117.

NT Schedule of Petroleum Exploration and Production Requirements.

Code of Practice: Onshore Petroleum Activities in the Northern Territory.

## 7. Contact for further information

For more information regarding this guideline, please contact the Energy Division's Operations team by email: [petroleum.operations@nt.gov.au](mailto:petroleum.operations@nt.gov.au).