



Purpose

This practice bulletin clarifies *authentication* and *validation* requirements for *professional work products (PWP)* created by the upstream oil and gas industry (“industry”). It focuses on well drilling and well completion activities, as these activities represent significant, pre-mitigation risk exposure to human health, the environment, expenditure, industry reputation, and regulatory compliance.

Specifically, this bulletin clarifies what constitutes *PWPs* for this industry and how *PWPs* are authenticated and validated to meet the requirements of the *Authenticating Professional Work Products* practice standard.

The italicized terms throughout this bulletin are defined in the practice standard *Authenticating Professional Work Products*. Refer to the latest version available at apega.ca/practice-standards.

Contributors

APEGA thanks everyone who contributed to this practice bulletin for their time and commitment. The contributors to this version were as follows:

- Explorers and Producers Association of Canada
- Canadian Association of Petroleum Producers
- Petroleum Services Association of Canada
- Canadian Association of Energy Contractors (formerly the Canadian Association of Oilwell Drilling Contractors)

Questions or suggestions concerning this document can be sent to:

Director, Professional Practice

professionalpractice@apega.ca

Visit apega.ca/practice-standards for more information.

Background

Despite the magnitude of upstream oil and gas industry development activity in Alberta, *PWPs* are not consistently authenticated and validated. Reasons for inconsistent *authentication* and *validation* include the use of numerous industry-recommended practices, prescriptive and actively enforced regulations from the Alberta Energy Regulator, and the need for clarity on *authentication* and *validation* requirements given the inherent uncertainty of subsurface conditions and activity.

Discussion

This section outlines three approaches to defining, authenticating, and validating *PWPs*. This list of approaches is not exhaustive, and *licensed professionals* must always use their professional judgement in determining what constitutes a *PWP* and how to appropriately authenticate and validate it. Regardless of the approach used, *authentication* and *validation* must be completed in accordance with the *permit holder's Professional Practice Management Plan (PPMP)* and must meet the intent of the *Authenticating Professional Work Products* practice standard.

The following three approaches are acceptable methods for meeting the intent of the practice standard. When using and deviating from a templated (reusable) document that has been authenticated and validated, additional consideration for *authentication* and *validation* is required. The operating company is responsible for authenticating and validating *PWPs* that are not otherwise authenticated and validated by the service providers.

- **Individual well design:** a detailed operational and engineering plan for constructing or completing a well, or defining specific changes to a particular well. These plans have many unique elements. Each well involves a range of known or estimated input parameters and is completed by individuals with specific expertise based on considerable prior experience.
- **Basis of design standard:** a set of specific, quantitative design criteria that can be safely and appropriately applied, and used repeatedly, across a geological play, region, or otherwise similar conditions (design inputs). For example, this method of document *authentication* and *validation* could be used as a program template for all wells within a multi-well drilling development. Basis of design standards can include multiple sections that are authenticated and validated by *licensed professionals* with the relevant skills and expertise.
- **Corporate standard:** one or more sets of specific, quantitative design criteria to be applied to a technical facet of a well's engineering and operation that are applied across the portfolio. This method of document *authentication* and *validation* could be used as a template for all product or service specifications, regardless of where a specific well is drilled. For example, a corporate standard may specify that only a specific grade of casing will ever be used for all drilling operations across multiple plays or basins.

Certain circumstances may require significant deviation from the authenticated and validated individual well design, basis of design standards, or corporate standards. The deviation must be documented through a management of change process referenced from, or outlined in, the *PPMP*. The deviation must be authenticated, validated, and handled similarly to the appropriate design standards themselves.

The contents of authenticated and validated *PWPs* in this context will change given the breadth of well designs across Alberta. *Licensed professionals* must consider the many common elements that are part of the design process for well drilling and well completions. Examples of these elements are outlined in Appendix A and Appendix B, respectively.

Appendix A – Example Design Elements for Well Drilling

Listed below are examples of design elements that require *authentication* and *validation* individually or that may be authenticated and validated as a component of one of the three methods outlined in this bulletin. This is not an exhaustive list—*licensed professionals* must use their professional judgement in determining what specific elements require *authentication* and *validation*.

Geological design criteria

- Subsurface hazard assessment
- Geological prognosis

Well planning

- H₂S risk assessment and H₂S release rates
- Directional plan and anti-collision

Well design

- Casing design factors and what load cases are evaluated
- Cementing
- Non-API (American Petroleum Institute) wellhead (e.g., thermal)
- Special considerations (e.g., under-balanced drilling, managed pressure drilling, and exploration wells)

Well control

- Barriers
- Drilling fluid
- Fracture communication or fracture-driven interaction

Appendix B – Example Design Elements for Well Completions

Listed below are examples of design elements that require *authentication* and *validation* individually or that may be authenticated and validated as a component of one of the three methods outlined in this bulletin. This is not an exhaustive list—*licensed professionals* must use their professional judgement in determining what specific elements require *authentication* and *validation*.

Reservoir design criteria

- Review geological and geomechanical logs

Well planning

- H₂S risk assessment and H₂S release rates
- Offset well review and fracture-driven interaction
- Reservoir pressure
- Frac planning zone

Well design

- Frac water compatibility and logistics
- Frac program design (e.g., maximum treating pressures and pumping equipment capabilities)
- Tubular, packer, and bridge plug specifications (e.g., pressure and metallurgy)

Well control

- Wellhead design and selection
- Frac head and manifold
- Frac pump shutdowns
- Emergency shutdown logic
- Fracture communication or fracture-driven interaction
- Barriers (e.g., pressure, flow containment, and specification changes)