

2017 REPORT

Oil and Gas Review

A|S|C

Alberta Securities Commission

DECEMBER 2017

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The ASC is proud to be the lead oil and gas regulator within the Canadian Securities Administrators, the umbrella group of Canada's provincial and territorial securities regulators.

The oil and gas industry, a critical economic driver for all of Canada, is experiencing unprecedented challenges, including economic, regulatory, political, social, environmental and market access. Our objective is to aid our oil and gas reporting issuers in addressing these market forces while continuing to provide strong investor protection.

The oil and gas review report is prepared annually by the ASC's Petroleum group, Corporate Finance division. The group is comprised of seasoned oil and gas professionals who understand the challenges currently facing industry and are dedicated to assisting reporting issuers in meeting their compliance requirements.

If there is anything that we can do to help, I urge you to contact me or staff in our Petroleum group. Their contact information is provided at the end of this report.

Kind regards,

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Each year the ASC issues four reports, created to provide timely and relevant information for market participants and reporting issuers. These reports include the annual report, the Alberta capital market report, the oil and gas review and the corporate finance disclosure review. These reports can be found on www.albertasecurities.com.

These terms are defined in section 1.1 of NI 51-101 *Standards of Disclosure For Oil and Gas Activities* and CSA Staff Notice 51-324 *Revised Glossary to NI 51-101 Standards of Disclosure for Oil and Gas Activities*.

“anticipated results” means information that may, in the opinion of a reasonable person, indicate the potential value or quantities of resources in respect of the reporting issuer’s resources or a portion of its resources and includes:

- (a) estimates of volume;
- (b) estimates of value;
- (c) areal extent;
- (d) pay thickness;
- (e) flow rates; or
- (f) hydrocarbon content.

“best estimate” means the value derived by an evaluator using deterministic methods that best represents the expected outcome with no optimism or conservatism. When a deterministic best estimate of reserves is prepared, this estimate, subject to other appropriate constraints, represents proved + probable reserves. If probabilistic methods are used, there should be at least a 50 percent probability (P_{50}) that the quantities actually recovered will equal or exceed the best estimate.

“chance of commerciality” means the product of the chance of discovery and the chance of development. The likelihood that a project will achieve commerciality is referred to as the “chance of commerciality.”

“chance of discovery” means the estimated probability that exploration activities will confirm the existence of a significant accumulation of potentially recoverable petroleum.

“commercial” means when a project is commercial this implies that the essential social, environmental, and economic

conditions are met, including political, legal, regulatory, and contractual conditions. Considerations with regard to determining commerciality include:

- economic viability of the related development project;
- a reasonable expectation that there will be a market for the expected sales quantities of production required to justify development;
- evidence that the necessary production and transportation facilities are available or can be made available;
- evidence that legal, contractual, environmental, governmental, and other social and economic concerns will allow for the actual implementation of the recovery project being evaluated;
- a reasonable expectation that all required internal and external approvals will be forthcoming. Evidence of this may include items such as signed contracts, budget approvals, and approvals for expenditures, etc.
- evidence to support a reasonable timetable for development. A reasonable time frame for the initiation of development depends on the specific circumstances and varies according to the scope of the project. Although five years is recommended as a maximum time frame for classification of a project as commercial, a longer time frame could be applied where, for example, development of economic projects are deferred at the option of the producer for, among other things, market-related reasons or to meet contractual or strategic objectives.

“contingent resources data” means:

- (a) an estimate of the volume of contingent resources, and
- (b) the risked net present value of future net revenue of contingent resources.

“development not viable” means where no further data acquisition or evaluation is currently planned and hence there is a low chance of development.

“development on hold” means where there is a reasonable chance of development, but there are major non-technical contingencies to be resolved that are usually beyond the control of the operator.

“development pending” means where resolution of the final conditions for development is being actively pursued (high chance of development).

“development unclarified” means when the evaluation is incomplete and there is ongoing activity to resolve any risks or uncertainties.

“effective date” in respect of information, means the date as at which, or for the period ended on which, the information is provided.

“evaluation” means, in relation to reserves data or resources other than reserves, the process whereby an economic analysis is made of a property to arrive at an estimate of a range of net present values of the estimated future net revenue resulting from the production of the reserves or resources other than reserves associated with the property.

“forecast prices and costs” means future prices and costs that are:

- (a) generally accepted as being a reasonable outlook of the future;
- (b) if, and only to the extent that, there are fixed or presently determinable future prices or costs to which the reporting issuer is legally bound by a contractual or other obligation to supply a physical

product, including those for an extension period of a contract that is likely to be extended, those prices or costs rather than the prices and costs referred to in subparagraph (a).

“future net revenue” means a forecast of revenue, estimated using forecast prices and costs or constant prices and costs, arising from the anticipated development and production of resources, net of the associated royalties, operating costs, development costs, and abandonment and reclamation costs.

“gas” includes natural gas, conventional natural gas, coal bed methane, gas hydrates, shale gas, and synthetic gas.

“gross”

- (a) In relation to a reporting issuer’s interest in production or reserves, its "company gross reserves", which are the reporting issuer’s working interest (operating or non-operating) share before deduction of royalties and without including any royalty interests of the reporting issuer.
- (b) In relation to wells, the total number of wells in which a reporting issuer has an interest.
- (c) In relation to properties, the total area of properties in which a reporting issuer has an interest.

“net”

- (a) In relation to a reporting issuer’s interest in production or reserves, the reporting issuer’s working interest (operating or non-operating) share after deduction of royalty obligations, plus the reporting issuer’s royalty interests in production or reserves.
- (b) In relation to a reporting issuer’s interest in wells, the number of wells obtained by aggregating the reporting issuer’s working interest in each of its gross wells.
- (c) In relation to a reporting issuer’s interest in a property, the total area in which the reporting issuer has an interest multiplied

by the working interest owned by the reporting issuer.

“oil” includes crude oil, bitumen, tight oil and synthetic crude oil.

“oil and gas activities” includes the following:

- (a) searching for a product type in its natural location;
- (b) acquiring property rights or a property for the purpose of exploring for or removing product types from their natural locations;
- (c) any activity necessary to remove product types from their natural locations, including construction, drilling, mining and production, and the acquisition, construction, installation and maintenance of field gathering and storage systems including treating, field processing and field storage;
- (d) producing or manufacturing of synthetic crude oil or synthetic gas;

but does not include any of the following:

- (e) any activity that occurs after the first point of sale;
- (f) any activity relating to the extraction of a substance other than a product type and their by-products;
- (g) extracting hydrocarbons as a consequence of the extraction of geothermal steam.

“property” includes:

- (a) fee ownership or a lease, concession, agreement, permit, licence or other interest representing the right to extract oil or gas subject to such terms as may be imposed by the conveyance of that interest;
- (b) royalty interests, production payments payable in oil or gas, and other non-operating interests in properties operated by others; and
- (c) an agreement with a foreign government or authority under which a reporting issuer participates in the operation of properties or otherwise serves as "producer" of the

underlying reserves (in contrast to being an independent purchaser, broker, dealer or importer).

A property does not include supply agreements, or contracts that represent a right to purchase, rather than extract, oil or gas.

“prospective resources data” means:

- (a) an estimate of the volume of prospective resources, and
- (b) the risked net present value of future net revenue of prospective resources.

“qualified reserves auditor” means an individual who:

- (a) in respect of particular reserves data, resources or related information, possesses professional qualifications and experience appropriate for the estimation, evaluation, review and audit of the reserves data, resources and related information; and
- (b) is a member in good standing of a professional organization.

“qualified reserves evaluator” means an individual who:

- (a) in respect of particular reserves data, resources or related information, possesses professional qualifications and experience appropriate for the estimation, evaluation and review of the reserves data, resources and related information; and
- (b) is a member in good standing of a professional organization.

“qualified reserves evaluator or auditor” means a qualified reserves evaluator or a qualified reserves auditor.

“reserves” means proved, probable or possible reserves.

“reserves data” means an estimate of proved reserves and probable reserves and related future net revenue, estimated using forecast prices and costs.

1. Introduction

1.1 General

Alberta is Canada's largest producer of crude oil and natural gas. In 2016, the province's oil and gas industry accounted for approximately 16 per cent of its gross domestic product. The ASC is proactive in its responsibilities, which include overseeing compliance of oil and gas disclosure, developing and maintaining disclosure requirements and oil and gas policy, and communicating with capital market participants. At the start of 2017, there were 183 reporting issuers (**RIs**) actively engaged in oil and gas activities and principally regulated by the Alberta Securities Commission (**ASC**). This represented 66 per cent of the 276 RIs actively engaged in oil and gas activities regulated by all Canadian jurisdictions. The ASC is the lead oil and gas regulator within the Canadian Securities Administrators (**CSA**), the umbrella group of Canada's provincial and territorial securities regulators.

The oil and gas review report (**Report**) is prepared annually by the Petroleum group in the ASC's Corporate Finance division. The Report consists of observations and analyses of disclosure from issuers that report under National Instrument 51-101 *Standards of Disclosure For Oil and Gas Activities* (**NI 51-101**), which sets out both the general disclosure standards and specific annual disclosure requirements for RIs engaged in oil and gas activities, in addition to select regulatory topics of current interest. The Report's content is drawn primarily from 2017 disclosure and is intended to assist RIs with their preparation of compliant and effective oil and gas disclosure for the benefit of all capital market participants.

The *Securities Act* (Alberta) is designed to ensure that Alberta's capital market operates fairly and efficiently, and that investors have access to timely and accurate information. To this end, the ASC encourages effective and compliant oil and gas disclosure, based on the provision of balanced, authentic, relevant and reliable information.

Under section 2.1 of NI 51-101, RIs are required to provide on an annual basis:

- Form 51-101F1 *Statement of Reserves Data and Other Oil and Gas Information* (**Form 51-101F1**);
- Form 51-101F2 *Report on [Reserves Data], [Contingent Resources Data] [and] [Prospective Resources Data] by Independent Qualified Reserves Evaluator or Auditor* (**Form 51-101F2**); and
- Form 51-101F3 *Report of Management and Directors on Oil and Gas Disclosure* (**Form 51-101F3**).

Specific circumstances may necessitate the filing of:

- Form 51-101F4 *Notice of Filing of 51-101F1 Information*; and
- Form 51-101F5 *Notice of Ceasing to Engage in Oil and Gas Activities*.

1.2 Executive summary of observations and analyses

The ASC reviews RIs' disclosure, including both general and required annual disclosure. The purpose of these reviews is to determine compliance with securities regulations, including NI 51-101. While disclosure is currently generally compliant, reviews conducted by staff have identified areas for improvement. This Report contains observations and analyses regarding some important areas of focus for RIs in the upcoming year:

- **Development timing for undeveloped reserves:**
 - disclosure regarding item 5.1 of Form 51-101F1, which requires discussion of the timing of development for proved undeveloped and probable undeveloped reserves
- **Disclosure of oil and gas properties and wells:**
 - disclosure regarding item 6.1 of Form 51-101F1, which requires identification and description of important properties, plants, facilities and installations
- **Disclosure of production estimates and history:**
 - disclosure regarding item 6.8 of Form 51-101F1, which requires disclosure of production estimates and related information
 - disclosure regarding item 6.9, which requires disclosure concerning production history
- **Contingent resources data and prospective resources data:**
 - chance of development for estimates of contingent resources data and prospective resources data
 - disclosure of contingent resources data beyond the development pending sub-class
- **Type wells (type curves) and associated information:**
 - source and date
 - compliance with the Canadian Oil and Gas Evaluation Handbook (**COGE Handbook**)
 - methodology
 - potentially misleading statements
- **Reserves reconciliations:**
 - opening and closing balances
 - issues with disclosure in individual reserve change categories, such as technical revisions and acquisitions
 - units of measure
 - reserve change categories
 - disclosure in individual reserve change categories

In addition, this Report contains a discussion of current oil and gas disclosure topics of interest, including pricing assumptions, the terms “commercial” and “commerciality,” and mechanical updates.

1.3 Disclosure – introduction

The oil and gas industry has been continuously shaped and guided by a number of forces. New technologies are developed, implemented, improved and supplanted, in response to economic factors like access to capital and labour costs, as well as regulatory, political and social factors. That said, the recent pace of change has been extraordinary; industry has evolved from a predominantly exploratory mindset to one of development, typically using horizontal wells drilled from multi-well pads and completed with intensive, multi-stage hydraulic stimulations. This has largely supplanted relatively low-cost vertical wells completed with perforations and low-tonnage stimulations and has resulted in:

- an increase in the amount of oil and gas that can be recovered from many reservoirs;
- extended development and production timeframes;
- increased capital requirements; and
- changes to oil and gas evaluation practices and disclosure.

The CSA has responded with initiatives that include:

- the publication of new disclosure requirements, policy and staff notices; and
- changes to the existing regulatory framework.

In addition to, and perhaps related to, the changes noted above, the Canadian oil and gas industry has experienced consolidation with respect to the number of RIs engaged in oil and gas activities. As illustrated in Figure 1, this has occurred for those RIs principally regulated by the ASC, as well as those principally regulated by all Canadian jurisdictions.

Figure 1 Reporting issuers principally regulated by the ASC and all Canadian jurisdictions

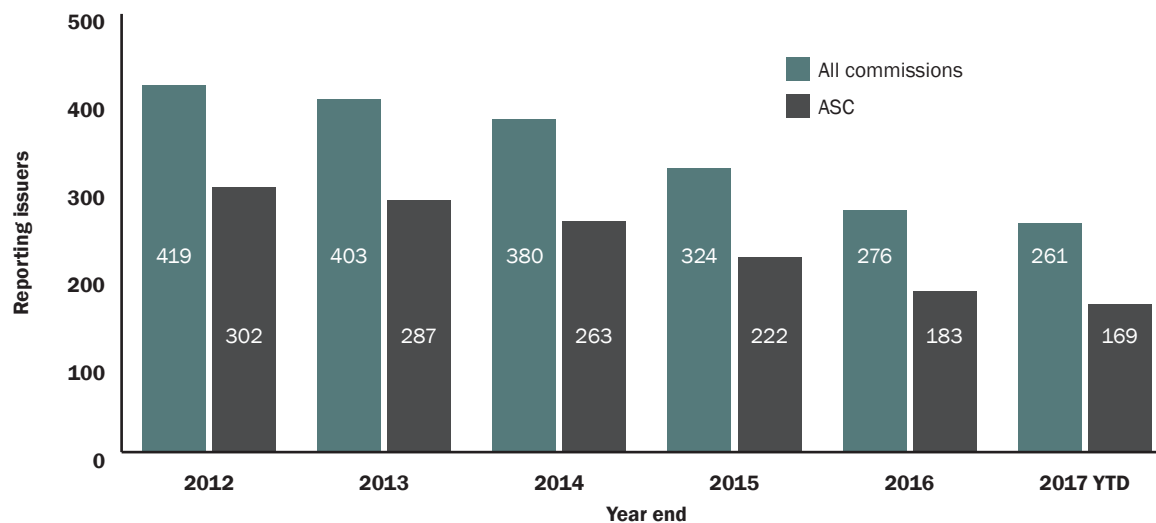
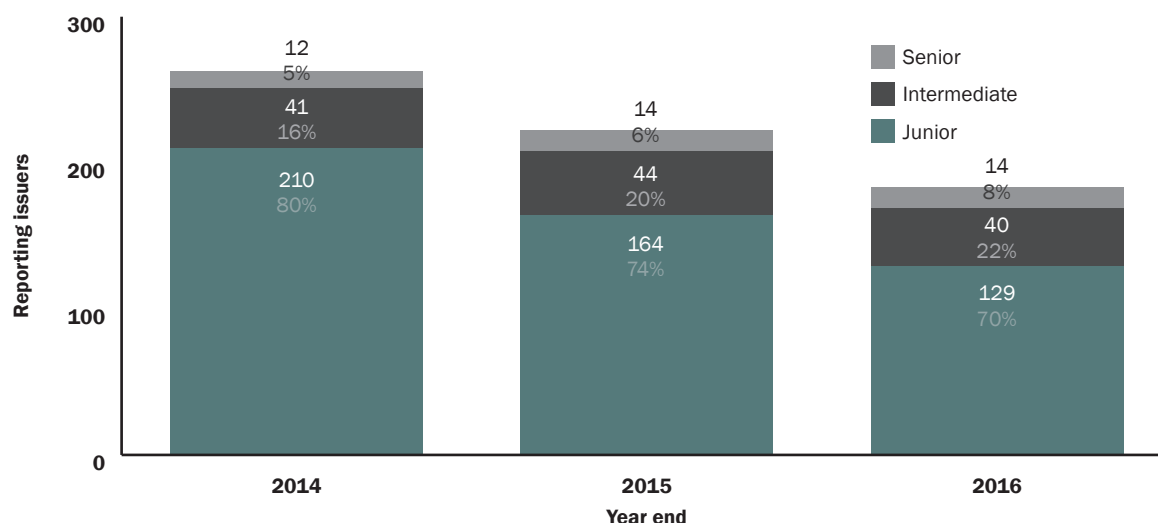


Figure 2 illustrates that while the number of RIs principally regulated by the ASC has declined, junior RIs account for virtually all of the decline, with the number of intermediate and senior RIs remaining relatively static. Per disclosure under item 6.9 of Form 51-101F1, the RIs are grouped as follows: seniors >100,000 barrels of oil equivalent (**BOE**) per day (based on a conversion ratio of six thousand cubic feet of gas for every one barrel of oil); intermediates 10,000 to 100,000 BOE per day and juniors <10,000 BOE per day.

Figure 2 Reporting issuers principally regulated by the ASC, by size

From the beginning of 2017 until the end of September 2017, there was a net change of (14) RIs engaged in oil and gas activities and principally regulated by the ASC. Figure 3 categorizes the reasons that account for this change, along with the number of RIs that correspond to each.

Figure 3 Net change in reporting issuers principally regulated by the ASC 2017 to present

Number of reporting issuers	Reasons for change
(7)	CCAA/receivership/bankruptcy
(3)	change in industry/acquired by a company in another industry
(4)	privatized/acquired by a company not principally regulated by the ASC
(2)	acquired by an RI principally regulated by the ASC
2	new RI
Total (14)	

1.3.1 Review process

In its role as the CSA's lead oil and gas regulator, the ASC has a rigorous oil and gas disclosure review process to assess compliance with securities legislation. This process primarily incorporates disclosure from RIs principally regulated by the ASC. These reviews may assess annual disclosure required by section 2.1 of NI 51-101, which includes the statement of information specified in Form 51-101F1 and reports in accordance with Form 51-101F2 and Form 51-101F3. In addition, prospectuses, management discussion and analysis, press releases, investor presentations, websites, and evaluations of oil and gas reserves and resources other than reserves may be incorporated.

Types of oil and gas reviews conducted by the ASC include:

- **Screening** – Incorporate annual filings, which include the statement of information specified in Form 51-101F1 and reports in accordance with Form 51-101F2 and Form 51-101F3.
- **Continuous disclosure** – Incorporate all oil and gas disclosure.
- **Prospectus**

- **News release**
- **Technical** – Incorporate evaluations of reserves and resources other than reserves and associated disclosure.

Specific circumstances help determine the outcome of each review. Outcomes include:

- No action taken
- Advisory comment(s) intended to improve disclosure
- Identification of deficiencies, including errors and omissions that may be misleading, with results that include:
 - Requirement to correct deficiencies
 - Issuer placed in default
 - Management cease trade order
 - Cease trade order
 - Referral to the ASC Enforcement division

NI 51-101 requires that all oil and gas disclosure be prepared in accordance with the COGE Handbook. As noted in section 1.1 of NI 51-101, the COGE Handbook is amended from time to time and accordingly, disclosure must be compliant with it upon publication of any changes. RIs that are uncertain as to whether their disclosure is compliant with the COGE Handbook, NI 51-101 or the *Securities Act* (Alberta), are encouraged to seek the advice of an appropriate professional advisor.

Section 92(4.1) of the *Securities Act* (Alberta) prohibits misleading disclosure:

No person or company shall make a statement that the person or company knows or reasonably ought to know

- (a) in any material respect and at the time and in the light of the circumstances in which it is made,
- (i) is misleading or untrue, or
 - (ii) does not state a fact that is required to be stated or that is necessary to make the statement not misleading,

and

- (b) would reasonably be expected to have a significant effect on the market price or value of a security, a derivative or an underlying interest of a derivative.

Section 1.4(2) of NI 51-101 states regarding materiality:

[I]nformation is *material* in respect of a *reporting issuer* if it would be likely to influence a decision by a reasonable investor to buy, hold or sell a security of the *reporting issuer*.

General guidance and several examples of misrepresentations and misleading statements are provided in section 2(a)(i)(A) of CSA Staff Notice 51-327 *Revised Guidance on Oil and Gas Disclosure (CSA SN 51-327)*.

2. Disclosure – overview

This section incorporates observations and analyses drawn from staff reviews of disclosure from RIs engaged in oil and gas activities.

2.1 Development timing for undeveloped reserves

Noted deficiency: Inadequate disclosure regarding item 5.1 of Form 51-101F1, which requires discussion of the timing of development for proved undeveloped and probable undeveloped reserves.

Item 5.1(1)(b) states:

[D]iscuss generally the basis on which the *reporting issuer* attributes *proved undeveloped reserves*, its plans (including timing) for developing the *proved undeveloped reserves* and, if applicable, its reasons for deferring the development of particular *proved undeveloped reserves* beyond two years.

Item 5.1(2)(b) states:

[D]iscuss generally the basis on which the *reporting issuer* attributes *probable undeveloped reserves*, its plans (including timing) for developing the *probable undeveloped reserves* and, if applicable, its reasons for deferring the development of particular *probable undeveloped reserves* beyond two years.

Instruction (2) of item 5.1 states:

The discussion of a reporting issuer's plans for developing undeveloped reserves, or the reporting issuer's reasons for deferring the development of undeveloped reserves, must enable a reasonable investor to assess the efforts made by the reporting issuer to convert undeveloped reserves to developed reserves.

Staff emphasize that the discussion regarding an RI's plans for developing undeveloped reserves or the reasons for deferring development of undeveloped reserves must be meaningful and specific to the circumstances of the RI.

The COGE Handbook discusses development timing for non-producing reserves. Section 5.5.4(f) of volume 1 states:

Non-producing reserves should be planned to be developed within a reasonable time frame. For projects requiring minor capital expenditures, two years is a recommended guideline unless the non-producing reserves are awaiting depletion of another producing zone or production levels are constrained by facility or market limitations. For larger capital expenditures, three years is a recommended guideline for assigning proved reserves and five years for assigning probable reserves. Exceptions to these guidelines are possible, but should be clearly documented [emphasis added].

Section 5.5.4(f) directs this disclosure to occur in the evaluation itself. Additional guidance concerning development timing for non-producing reserves is found in section 5.7 of volume 2, which states:

Non-producing reserves that are near existing infrastructure and require minor capital should normally be developed within a two-year period. Exceptions are non-producing reserves awaiting depletion of another producing zone in the same wellbore or where production levels are constrained by facility or market limitations.

The evaluator should review undeveloped reserves estimates if development has not proceeded as previously planned by the operator. The evaluator should consider the cause of the delay and any consequent impact on the confidence level associated with the reserves estimate.

For large projects, where significant capital is required for field development or infrastructure construction (offshore, oil sands, etc.), significant capital expenditures should normally commence within three years for assignment of proved reserves. For the assignment of probable reserves, significant capital spending should normally commence within five years. If no proved or probable reserves can be assigned based on this guidance, then the associated oil and gas quantities should be classified as resources.

Furthermore, section 5.3.2 of volume 1 discusses commercial status and states:

A reasonable time frame for the initiation of development depends on the specific circumstances and varies according to the scope of the project. While five years is recommended as a maximum time frame for classification of a project as commercial, a longer time frame could be applied where, for example, development of economic projects are deferred at the option of the producer for, among other things, market-related reasons or to meet contractual or strategic objectives.

When evaluations of reserves and resources other than reserves are reviewed, staff generally seek documentation in situations where development timing exceeds COGE Handbook guidance. An absence of clear documentation may result in an evaluation being considered to have not been prepared in accordance with the COGE Handbook. As this would contravene NI 51-101, disclosure of information from such an evaluation would not be permitted. It may be appropriate to include documentation concerning development timing that exceeds guidance in the COGE Handbook within the disclosure required by items 5.1(1)(b) and 5.1(2)(b) and perhaps within disclosure required by item 5.2 of Form 51-101F1, which concerns identification and discussion of significant factors or uncertainties that affect certain components of the reserves data.

EXAMPLE

Development of the company's proved undeveloped reserves is expected to occur over the next three years, while development of its probable undeveloped reserves is expected to occur over the next five years. This timing may change based upon factors that include commodity prices, capital availability, facility access, regulatory approval and new geological and engineering data.

Staff's concerns with this disclosure include:

- the disclosure is not meaningful and specific to the circumstances of the RI, as discussed in instruction (2) of item 5.1 of Form 51-101F1;

- the reasons for the RI deferring development of the proved undeveloped reserves and probable undeveloped reserves beyond two years are absent; and
- the RI should exercise caution regarding the factors that may impact timing, as they may influence project commerciality; a project must be commercial in order for reserves to be assigned. (See section 3.3 of this Report.)

2.2 Oil and gas properties and wells

Noted deficiency: Inadequate disclosure regarding item 6.1 of Form 51-101F1, which requires identification and description of important properties, plants, facilities and installations. Specific concerns relate to items 6.1(1)(c) and 6.1(2).

Per item 6.1(1)(c):

[I]n respect of properties to which reserves have been attributed and which are capable of producing but which are not producing, disclosing how long they have been in that condition and discussing the general proximity of pipelines or other means of transportation;

Per item 6.1(2):

State, separately for *oil* wells and *gas* wells, the number of the *reporting issuer's* producing wells and non-producing wells, expressed in terms of both *gross* wells and *net* wells, by location (province, territory or state if in Canada or the United States, and country otherwise).

Staff has observed an absence of disclosure regarding non-producing wells and wells that do not have reserves assigned to them. RIs are reminded that item 6.1(2) requires the disclosure of both producing oil and gas wells and non-producing oil and gas wells, regardless of whether reserves are currently assigned.

Oil well and gas well are not defined in NI 51-101, CSA Staff Notice 51-324 *Revised Glossary to NI 51-101 Standards of Disclosure for Oil and Gas Activities (CSA SN 51-324)* nor in the COGE Handbook. However, staff is of the view that for item 6.1, an oil well should be considered a well that has previously produced, currently produces or is expected to produce oil, while a gas well is one that has previously produced, currently produces or is expected to produce gas. Both oil and gas are defined in CSA SN 51-324. Oil includes crude oil, bitumen, tight oil and synthetic crude oil. Gas includes natural gas, conventional natural gas, coal bed methane, gas hydrates, shale gas, and synthetic gas.

EXAMPLE

Figure 4 Example of well disclosure

Wells (Canada)	Gross	Net
Oil	10	8
Gas	5	3
Total	15	11

Only wells with reserves assigned are included.
Steam assisted gravity wells are excluded.

Staff's concerns with this disclosure include:

- it is unclear if the disclosure represents either or both producing wells and non-producing wells; producing and non-producing wells are not differentiated, as required per item 6.1(2);
- it is noted that only wells with reserves assigned are included in the disclosure; item 6.1(2) requires all producing wells and non-producing wells to be disclosed, regardless of whether reserves are currently assigned; and
- it is noted that the Company's steam assisted gravity drainage wells are not included in the disclosure; item 6.1(2) requires all producing and non-producing oil wells and gas wells to be disclosed, including wells drilled to extract oil using steam assisted gravity drainage wells.

2.3 Production estimates and history

Noted deficiency: Inadequate disclosure regarding item 6.8 of Form 51-101F1, which requires disclosure of production estimates and related information, and item 6.9, which requires disclosure regarding production history. Specific concerns relate to item 6.8(2) and item 6.9(2).

Per item 6.8(1):

Disclose, by country, for each *product type*, the volume of *production* estimated for the first year reflected in the estimates of *gross proved reserves* and *gross probable reserves* disclosed under Item 2.1.

Per item 6.8(2):

If one *field* accounts for 20 percent or more of the estimated *production* disclosed under section 1, identify that *field* and disclose the volume of *production* estimated for the *field* for that year.

“Field” is discussed in section 5.8 of Companion Policy 51-101CP *Standards of Disclosure For Oil and Gas Activities (51-101CP)*, which states:

For the purposes of NI 51-101, CSA staff interpret a field to be limited to a single pool or grouping of several pools within the geographic area or administrative unit from which *product types* can reasonably be recovered.

Disclosure regarding item 6.8(2) is frequently absent in instances where an RI has at least one field that meets the criteria and is expected to have information to disclose.

Per item 6.9(1):

Disclose, for each quarter of its most recent financial year, by country for each *product type*:

(a) the *reporting issuer's* share of average gross daily production volume;

Per item 6.9(2):

For each important *field*, and in total, disclose the *reporting issuer's* production volumes for the most recent financial year, for each *product type*.

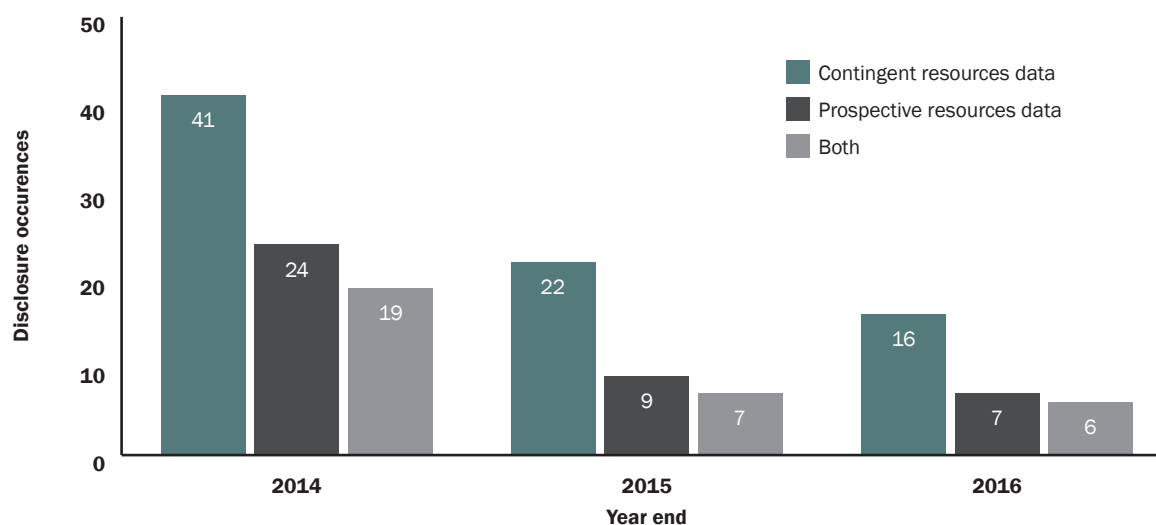
While the term “important” is not defined or otherwise clarified in NI 51-101, its related forms or in 51-101CP, staff is of the view that RIs should consider the requirements of item 6.8(2): if one field accounts for 20 per cent or more of the estimated total production for the RI, identify that field.

2.4 Contingent resources data and prospective resources data – introduction

Noted deficiency: Potentially optimistic numeric chance of development for estimates of contingent resources data and prospective resources data, as well as disclosure beyond the development pending sub-class of contingent resources, which has the potential to be misleading.

In 2017, 17 RIs principally regulated by the ASC disclosed one or both of contingent resources data and prospective resources data in the annual disclosure required by section 2.1 of NI 51-101, with respect to oil and gas activities conducted in 2016. Sixteen of these RIs disclosed contingent resources data, while one disclosed prospective resources data. Six RIs disclosed both. This information is illustrated in Figure 5, with accompanying statistics for 2015 and 2014. Staff believe that key reasons for this decline include diminished capital raising activities and investor interest.

Figure 5 Disclosure of contingent resources data and prospective resources data by reporting issuers principally regulated by the ASC



Under NI 51-101, disclosure of contingent resources, contingent resources data, prospective resources and prospective resources data, is generally optional. Exceptions include:

- if the information is material with respect to section 1.4(2) of NI 51-101 (also see section 2(a)(i) (B) of CSA SN 51-327);
- information concerning properties with no attributed reserves that is required to be disclosed under part 6 of Form 51-101F1 (see section 5.7(1) of 51-101CP for additional information); and
- prospectus disclosure if the information is material to the RI as contemplated by NI 51-101, per the general securities disclosure obligation of “full, true and plain” disclosure of all material facts, even if the disclosure is not specifically mandated by NI 51-101 (refer to section 5.10(2) of 51-101CP and item 5.5 of Form 41-101F1 *Information Required in a Prospectus*, which discusses requirements for RIs with oil and gas operations).

2.4.1 Chance of development

Staff has observed instances where numeric values of chance of development may be overly optimistic. This is particularly true for contingent resources data and its associated sub-classes: development pending, development on hold, development unclarified and development not viable.

Part 7 of Form 51-101F1 discusses the optional disclosure of contingent resources data and prospective resources data. Instruction (1) of part 7 states:

A reporting issuer may disclose contingent resources data or prospective resources data in a statement of the reserves data and other information filed under item 1 of section 2.1 of NI 51-101, however, that data must only be disclosed as an appendix to that statement.

If an RI discloses contingent resources data or prospective resources data as an appendix to the statement filed under item 1 of section 2.1 of NI 51-101 (Form 51-101F1), part 7 requires the risking of all estimates of volumes and future net revenue, and disclosure of the methodology used to determine the estimates. All estimates must be risked because contingent resources data and prospective resources data are subject to risks that result in a less-than-100 per cent chance of commerciality. CSA SN 51-324 defines chance of commerciality as the product of the chance of discovery and the chance of development. Chance of commerciality is discussed in more detail in section 3.3 of this Report.

CSA SN 51-324 defines chance of discovery as the estimated probability that exploration activities will confirm the existence of a significant accumulation of potentially recoverable petroleum.

Prospective resources data have a chance of discovery and a chance of development. Since contingent resources data are already discovered, the chance of commerciality is equal to the chance of development.

CSA SN 51-324 defines chance of development as the estimated probability that, once discovered, a known accumulation will be commercially developed.

Item 7.1 of Form 51-101F1 discusses contingent resources data. Item 7.1(1)(a) requires classification of estimates in each applicable project maturity sub-class of contingent resources, while item 7.1(2) requires disclosure of the numeric value of the chance of development risk and a description of the method of:

- (a) quantifying the *chance of development risk*;
- (b) estimating the *contingent resources* adjusted for *chance of development risk* and the associated *risked net present value of future net revenue*.

Item 7.2 discusses prospective resources data. Item 7.2(2) requires disclosure of the numeric value of the chance of discovery and chance of development, and a description of the method of:

- (a) quantifying the *chance of discovery* and *chance of development*;
- (b) estimating the *prospective resources* adjusted for *chance of discovery* and *chance of development*.

Staff emphasize the requirement to provide a description regarding the determination of risked volumes and values disclosed under items 7.1(2) and 7.2(2).

Section 2.7 of 51-101CP discusses disclosure in Form 51-101F1. Section 2.7(4.1) discusses quantification of chance of development for disclosure under Form 51-101F1 and states:

Contingent resources in the *development pending project maturity sub-class* have the highest chance of development and *commerciality* of all resources other than reserves. Because there is additional uncertainty with the other *project maturity sub-classes of contingent resources* and *prospective resources*, disclosure of the risked net present value of *prospective resources* and *contingent resources* other than in the *development pending project maturity sub-class* should be

accompanied by a detailed explanation of *chance of commerciality*, which includes both the *chance of discovery* and the *chance of development* based on economic and development-related factors (such as development plans, production forecasts, markets, facilities, capital and operating costs, product prices and approvals) in the case of *prospective resources* and *chance of development* in the case of *contingent resources*. Without disclosure relating to the *chance of discovery* and *chance of development*, disclosure of the risked net present value of *prospective resources* and *contingent resources* other than in the *development pending project maturity sub-class* may be misleading.

CSA SN 51-324 defines the four project maturity sub-classes of contingent resources. These follow in order of decreasing chance of commerciality:

- **Development pending** - resolution of the final conditions for development is being actively pursued (high chance of development).
- **Development on hold** - there is a reasonable chance of development, but there are major non-technical contingencies to be resolved that are usually beyond the control of the operator.
- **Development unclarified** - the evaluation is incomplete and there is ongoing activity to resolve any risks or uncertainties.
- **Development not viable** - no further data acquisition or evaluation is currently planned and hence there is a low chance of development.

Section 2.5.1 of volume 2 of the COGE Handbook states regarding development pending:

The development pending project maturity subclass is described as requiring a “high probability of becoming a commercial development,” which is equivalent to the probability of removal of all contingencies. The term “high probability” is generally considered to be about 80 percent, which may be considered to be a minimum for the removal of all contingencies.

Section 2.5.5(d) states regarding development on hold:

[I]t is more likely than not that the contingencies will be resolved.

Statistically, “more likely than not” means that the numeric chance of development exceeds 50 per cent for development on hold. Staff consider the low chance of development for sub-class development not viable to mean that development is unlikely to proceed. As a result, the numeric chance of development cannot exceed 50 per cent.

Figure 6 provides information with respect to the numeric values of chance of development by sub-class, attributed to the disclosure of contingent resources data discussed in section 2.5 of this Report.

Figure 6 Numeric values of chance of development for contingent resources data

	Development pending	Development on hold	Development unclarified	Development not viable
	Chance of development (%)			
Occurrences	18	5	13	2
High	95	77	85	47
Low	72	60	25	20
Average	87	70	54	34

2.4.2 Contingent resources data beyond the development pending sub-class

While disclosed contingent resources data is most commonly in the development pending sub-class, disclosure in the development on hold, development unclarified and development not viable project maturity sub-classes does occasionally occur. In some instances, there is not enough information concurrently provided to ensure that the disclosure is not misleading.

Guidance (4) of part 7 of Form 51-101F1 states:

All public disclosure by reporting issuers is subject to the general prohibition against misleading statements. The disclosure of development on-hold, development unclarified or development not viable contingent resources, or prospective resources, in the statement of reserves data and other oil and gas information might be misleading where there is a significant degree of uncertainty and risk associated with those estimates.

Therefore, if an RI discloses contingent resources data in a project maturity sub-class other than development pending as an appendix to a statement of the reserves data and other information filed under item 1 of section 2.1 of NI 51-101, the RI must ensure that the disclosure is not misleading. It may be possible to accomplish this by meeting all of the disclosure requirements of part 7. However, an RI should consider general instruction (5) of Form 51-101F1, which states:

This Form 51-101F1 sets out minimum requirements. A reporting issuer may provide additional information not required in this Form 51-101F1 provided that it is not misleading and not inconsistent with the requirements of NI 51-101, and provided that material information required to be disclosed is not omitted [...]

If it is not possible to ensure that potential disclosure is not misleading, the RI must refrain from proceeding with the disclosure.

2.5 Type wells (type curves) and associated information

Noted deficiency: Disclosure regarding type wells (type curves) and associated information. Concerns involve source and date of the disclosure, compliance with the COGE Handbook, methodology and related statements that in certain circumstances may be misleading.

With respect to the estimation and classification of reserves and resources other than reserves, a type well represents production performance over a period of time for an average well with specified characteristics. A type well represents a likely outcome for a comparable reservoir and is ideally constructed by averaging historic and forecast production estimates for a specific period of time. The resulting profile is often referred to as a type curve. A type well can be used to estimate production performance, recoverable volumes and cash flows and related profitability indicators for a comparable well or wells. This information is relied upon by;

- qualified reserves evaluators and auditors to estimate production performance and recoverable volumes for analogous drilling locations and wells with minimal production history;
- RIs to make investment decisions regarding analogous drilling locations and to inform investors; and
- investors, when making a decision as to whether or not to invest in an RI.

While evaluations of reserves and resources other than reserves typically include type wells and associated information, such as recoverable volumes and economics, disclosure of these types of information also frequently occurs. This most commonly occurs in news releases, investor presentations, prospectuses and on RI websites.

Type wells and associated information may be a form of analogous information, which is defined in section 1.1 of NI 51-101 as:

[I]nformation about an area outside the area in which the *reporting issuer* has an interest or intends to acquire an interest, which is referenced by the *reporting issuer* for the purpose of drawing a comparison or conclusion to an area in which the *reporting issuer* has an interest or intends to acquire an interest, which comparison or conclusion is reasonable, and includes:

- (a) historical information concerning *reserves*;
- (b) estimates of the volume or value of *reserves*;
- (c) historical information concerning *resources*;
- (d) estimates of the volume or value of *resources*;
- (e) historical *production* amounts;
- (f) *production* estimates; or
- (g) information concerning a *field*, well, basin or *reservoir*.

Analogous information is discussed in section 5.10 of NI 51-101. Section 5.10(2) states:

[I]f a *reporting issuer* discloses information that is an *anticipated result*, an estimate of a quantity of *reserves* or *resources*, or an estimate of value attributable to an estimated quantity of *reserves* or *resources* for an area in which it has an interest or intends to acquire an interest, that is based on an extrapolation from *analogous information*, sections 5.2, 5.3, 5.9 and 5.16 apply to the disclosure of the information.

RIs are directed to section 5.8 of 51-101CP for further information concerning disclosure of analogous information.

Staff note the following common deficiencies with respect to type wells and associated information:

- **Source and date** – Disclosure of the source and date is required. If this is omitted, it may be unclear whether or not the disclosure has been prepared or audited by an RI's qualified reserves evaluator or auditor or by an independent qualified reserves evaluator or auditor. Section 5.2(1)(a)(ii) of NI 51-101 discusses this requirement for reserves, while section 5.9(2)(a) does so for resources other than reserves in which the RI has an interest or intends to acquire an interest, or an estimated value attributable to an estimated quantity. Section 5.10(1)(c) discusses this with respect to analogous information.

Section 5.2(a)(i) requires disclosure of the effective date for estimates of reserves or future net revenue, while section 5.9(2)(d)(ii) requires disclosure of the effective date of the estimate of a quantity of resources other than reserves in which the RI has an interest or intends to acquire an interest, or an estimated value attributable to an estimated quantity. If the disclosure includes analogous information, section 5.10(1)(a) requires disclosure of the source and date.

- **Compliance with the COGE Handbook** – All disclosure is required to be prepared or audited in accordance with the COGE Handbook. This is discussed in section 5.2(1)(a)(iii) of NI 51-101 with respect to reserves and section 5.9(2)(b) for resources other than reserves in which the RI has an interest or intends to acquire an interest, or an estimated value attributable to an estimated quantity. Section 5.10(1)(c) discusses this with respect to analogous information. Additionally, Form 51-101F2 requires that the independent qualified reserves evaluator or auditor carry out their efforts in accordance with the standards set out in the COGE Handbook.
- **Methodology** – Information regarding how disclosure was prepared is required in some instances. Even if it is not required, its inclusion can reduce the chances that disclosure will be considered potentially misleading. Section 5.9 of NI 51-101 contains specific requirements regarding the preparation of disclosure of resources other than reserves. Section 5.14 discusses requirements with respect to disclosure of oil and gas metrics.

Requirements regarding preparation of analogous information are found in section 5.10 and discussed in section 5.8 of 51-101CP. Information prepared and disclosed by RIs sometimes includes only the best wells and excludes dry holes and poor performing wells, while wells with dissimilar reservoir parameters or completion procedures are sometimes included. Section 5.8 of the 51-101CP states regarding analogous information:

It is important to present a factual and balanced view of the information being provided.

- **Potentially misleading statements** – Typical examples of potentially misleading statements include disclosure such as “test results/production exceed our type well,” with little or no accompanying information to clarify the context and relevance. Information that may help in this regard includes the category of reserves or resources other than reserves associated with the type well and the source and date of the associated estimates. For the purposes of balanced disclosure, an RI should ensure that results that are not meeting expectations are also discussed. Drawing attention to positive results while ignoring or downplaying negative results may be considered misleading. Misleading by omission of information is specifically prohibited by section

92(4.1)(a)(ii) of the *Securities Act* (Alberta).

An RI must consider whether results being contemplated for disclosure are significantly different from the results associated with the certainty levels attributed to the category of recoverable resource in the initial forecast. If the estimation and classification of recoverable resources is done appropriately, long-term results should not vary from the certainty levels attributed to the estimates.

Section 5.3.5 of volume 1 of the COGE Handbook states that low estimates for reserves and resources other than reserves are conservative and are likely to be exceeded.

If probabilistic methods are used, there should be at least a 90 percent probability (P_{90}) that the quantities actually recovered will equal or exceed the low estimate.

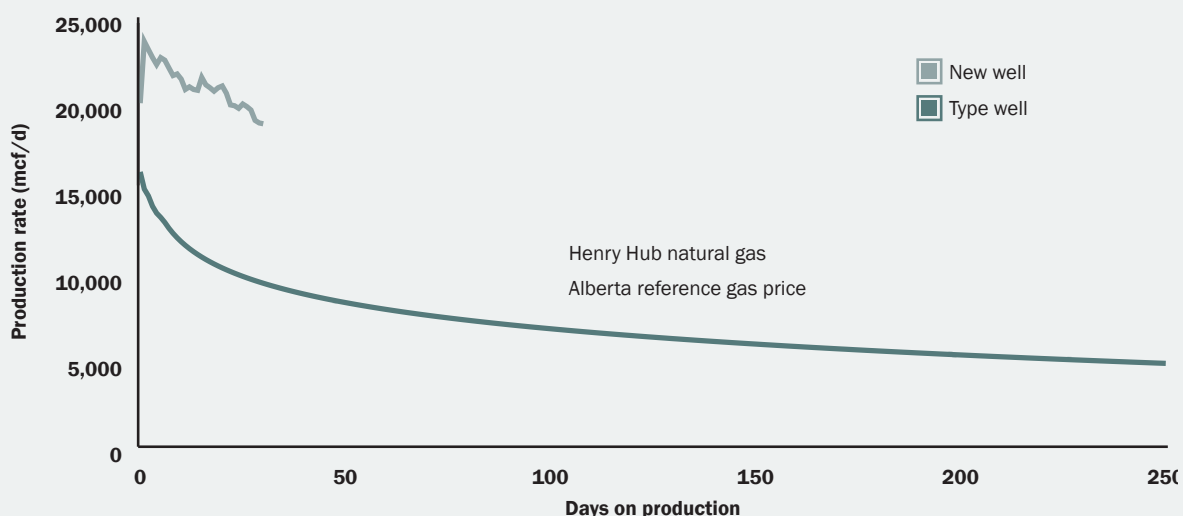
For best estimates, it should be equally likely that the quantities actually recovered will be greater or less than the best estimate.

If probabilistic methods are used, there should be at least a 50 percent probability (P_{50}) that the quantities actually recovered will equal or exceed the best estimate.

An example of typically deficient type well disclosure is provided in Figure 7. The example compares short term production results from a well to a production profile labelled “type well.” A brief description accompanies the example disclosure.

EXAMPLE

Figure 7 Example of type well disclosure



“Results from our new well exceed our type well.”

Staff's concerns with this disclosure include:

- a limited amount of production data is presented, which may not be indicative of longer term performance;
- the disclosure refers to only one well, while the RI has recently placed multiple wells on production and therefore the disclosure may not be balanced;
- no information is provided with respect to the categories of reserves or resources other than reserves associated with the type curve (see section 5.3 of NI 51-101);
- the source of the type well is not provided;
- the type well may be analogous information, as defined in section 1.1 of NI 51-101; however, it doesn't appear to meet the requirements of section 5.10 of NI 51-101;
- it is unclear if the type well has been prepared or audited by a qualified reserves evaluator or auditor, as required by sections 5.2(1)(a)(ii), 5.9(2)(a) and 5.10(1)(c) of NI 51-101; and
- it is unclear if the type well has been prepared in accordance with the COGE Handbook, as required by sections 5.2(1)(a)(iii), 5.9(2)(b) and 5.10(1)(c) of NI 51-101.

2.6 Reserves reconciliations

Item 4.1 of Form 51-101F1 requires disclosure of an annual reconciliation of changes in estimates of gross proved reserves (in total), gross probable reserves (in total) and gross proved plus probable reserves (in total). This is required by country, product type specified in item 4.1(2)(b) and reserve change category specified in item 4.1(2)(c). An accompanying explanation is also required for any disclosure that occurs in each reserve change category. This reconciliation compares reserves data at the effective date for the current financial year, with the corresponding estimates at the last day of the preceding financial year, which is the "opening balance" of the reconciliation. The "closing balance" is the result of this comparison.

Reserve change categories specified in item 4.1(2)(c) are:

- (i) extensions and improved recovery;
- (ii) technical revisions;
- (iii) discoveries;
- (iv) acquisitions;
- (v) dispositions;
- (vi) economic factors;
- (vii) *production*.

Instruction (4) of item 4.1 requires reserves attributed to infill drilling to be either included in extensions and improved recovery or in a separate reserve change category labelled "infill drilling."

Staff note the following common deficiencies with respect to reserves reconciliations:

- **Opening balance** – Volumes for the current year do not match the previous year's closing

balance. These should match.

- **Extensions and improved recovery, infill drilling and discoveries** – The erroneous recording of negative volumes. Once volumes have been assigned to these reserve change categories, subsequent changes should be identified as either technical revisions or economic factors, except as noted in section 7.3.4 of volume 2 of the COGE Handbook.
- **Technical revisions** – The erroneous recording of negative volumes that exceed 100 per cent of the opening balance. It is impossible to remove a volume of reserves in excess of the opening balance through a technical revision.
- **Acquisitions** – The use of incorrect dates when accounting for reserves additions through acquisitions. Paragraph 7.3.3(g) of volume 2 of the COGE Handbook states:

The reserves additions are recorded at the closing date of the acquisition.

RIs should instead refer to section 2.7(6)(c) of 51-101CP, which states that the proper date to reconcile changes in the acquired reserves is the effective date of the RI's most recent financial year:

[T]he reserves estimate to be used in the reconciliation is the estimate of reserves at the *effective date*, not at the acquisition date, plus any *production* since the acquisition date. This *production* must be included as *production* in the reconciliation. If there has been a change in the reserves estimate between the acquisition date and the *effective date* other than that due to *production*, the *reporting issuer* should explain this as part of the reconciliation in a footnote to the reconciliation table.

Effective date is defined in section 1.1 of NI 51-101 as the date as at which, or for the period ended on which, the information is provided.

In summary, the reserves estimate to be used in the reserve change category “acquisitions” is the sum of:

- the estimates of the reserves data by product type attributed to the acquisition at the effective date of the current financial year; and
- the production by product type that has occurred from the acquisition, from the effective date of the acquisition to the effective date for the current financial year.

Although reserves estimates may be determined at any point during the financial year, reserves are only reconciled for the purposes of item 4.1 at the last day of the current financial year.

The individual steps in such a reconciliation are:

1. Evaluate all of the RI's reserves data at the effective date for the most recent financial year. This includes the properties acquired during the most recent financial year.
2. Determine the RI's share of the gross production volume by product type, derived from the acquired properties from the effective date of the acquisition to the effective date of the most recent financial year.
3. Add the production volume by product type that was determined in step 2 to the reserves data attributed to the acquired properties as determined in step 1.

4. Enter the results from step 3 into the reconciliation table under the reserve change category “acquisitions,” respecting the appropriate product type.

- **Production** – Volumes do not match those disclosed under item 6.9(1)(a) of Form 51-101F1. These should match.
- **Closing balance** – Volumes do not match those disclosed under item 2.1(1) of Form 51-101F1. These should match.
- **Units of measure** – These are missing or inconsistent. Although no particular unit of measure is specified in Form 51-101F1, consistency of units is addressed in general instruction (8) of Form 51-101F1, which advises against switching between imperial units and Système International (SI) units, without compelling reason. If switching does occur, staff encourages disclosure of the reason.
- **Reserve change categories** – The use of categories not specified in item 4.1(2)(c) or instruction (4) of item 4.1. An RI must use the available categories and if necessary, explain unusual circumstances.
- **Explanations** – None provided to accompany disclosure in individual reserve change categories. Item 4.1(2)(c) requires separate identification and explanation of disclosure in each reserve change category. Without an explanation, changes may occur that cannot be easily understood. Examples of this include a large technical revision, an acquisition or a re-categorization of reserves. For the latter, probable reserves could be re-categorized as proved reserves, which in the absence of an explanation, could go unnoticed if the proved plus probable reserves (in total) remain otherwise unchanged.

Instruction (5) of item 4.1 of Form 51-101F1 discusses reconciliation requirements for RIs that become engaged in oil and gas activities after the last day of their preceding financial year, resulting in an absence of reserves data at the effective date for the preceding financial year. In this circumstance, there is no opening balance and no reconciliation can be undertaken. Instead, RIs are required to provide the reason for its absence.

Additional information concerning preparation of the reserves reconciliation is provided in 51-101CP. For example, section 2.7(6)(a) discusses a scenario in which an RI reports reserves for its current financial year, but had no reserves to report at the start of the financial year (at which time the RI was presumably engaged in oil and gas activities). If the added reserves were material to the RI, a reconciliation must be disclosed. In these situations, the opening balance will be zero. Additionally, section 5.10(4) of 51-101CP discusses reserves reconciliations with respect to initial public offerings.

2.6.1 Analysis

Figure 8 presents grouped reconciliations of summed gross proved plus probable reserves (in total) disclosed in 2017 by RIs principally regulated by the ASC. While generalized, the purpose is to assess the quality of reserves estimates disclosed by RIs of similar size. The following steps were followed to generate these grouped reconciliations:

1. All RIs were ranked by their share of annual average gross daily production volumes based on disclosed quarterly production for their most recent financial year, by country and product type under item 6.9 of Form 51-101F1.

2. The ranked RIs were grouped as follows: seniors >100,000 BOE per day, intermediates 10,000 to 100,000 BOE per day, and juniors <10,000 BOE per day.
3. The highest ranked RIs were selected from each group, incorporating ten senior, 20 intermediate and 50 junior RIs.
4. Within each group of selected RIs, volumes disclosed by each RI in each applicable reserve change category specified in item 4.1(2)(c) of Form 51-101F1 were summed.
5. The per cent change between the opening balance of 2016 (the closing balance of 2015) and the closing balance of 2016 was calculated. The results are presented in Figure 8. Positive and negative changes plot to the right and left of the opening balance (denoted as 0 per cent), respectively.

Figure 8 2016 gross proved plus probable reserves (in total) reconciliations by RI group

Figure 8a Seniors

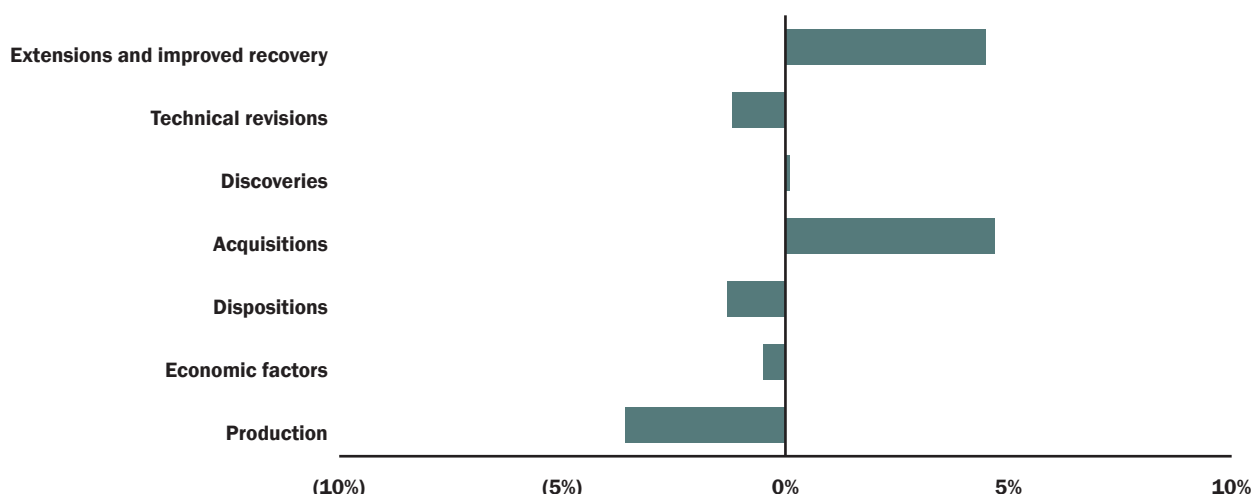


Figure 8b Intermediates

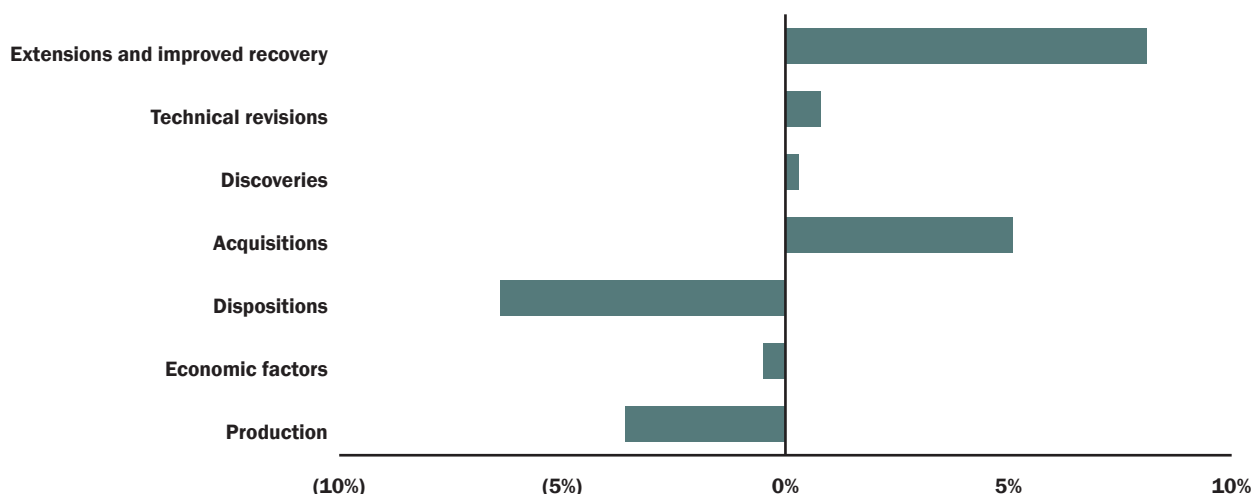
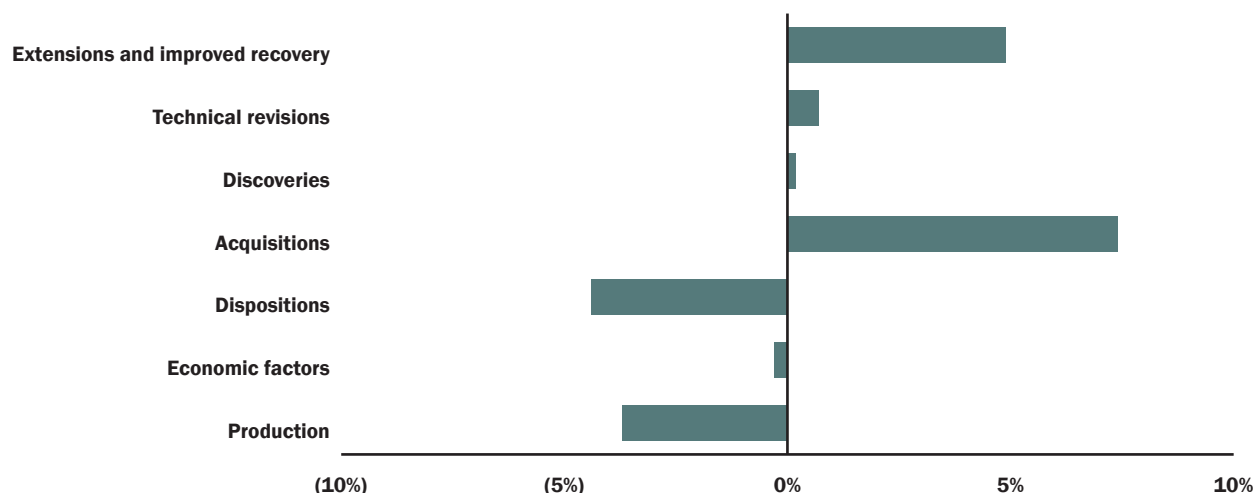


Figure 8c Juniors



As illustrated in Figure 8, changes in extensions and improved recovery range from 5 per cent for the seniors and juniors, to 8 per cent for the intermediates. For the seniors, a large value for one RI disproportionately affects the result. For the juniors, 30 RIs recorded less than a 1 per cent change, while 23 of these had no change at all.

Technical revisions are neutral for all groups, ranging from negative 1 per cent for the seniors to 1 per cent for the juniors and intermediates. One senior, three intermediate and three junior RIs disproportionately influence the technical revisions in their respective groups.

Discoveries are negligible for all groups. This is consistent with the continuing movement away from exploratory activity in recent years and an increasing emphasis on activities related to extensions and improved recovery and more recently, acquisitions. However, three senior RIs account for 91 per cent of the change for the group, with four recording no discoveries. Three intermediate RIs account for 100 per cent of discoveries for the group, while three junior RIs account for 87 per cent.

Acquisitions significantly increased over the previous report. Changes range from 5 per cent for both the seniors and intermediates to 7 per cent for the juniors. Three senior RIs account for 92 per cent of the acquisitions for the group, while five account for 90 per cent for the intermediates and six account for 69 per cent for the juniors. Changes in dispositions range from 1 per cent for the seniors, to 6 per cent for the intermediates. Four senior RIs account for 98 per cent of the dispositions for the group, while four account for 77 per cent for the intermediates, and eight account for 94 per cent of the dispositions for the juniors.

All three groups show small negative adjustments for economic factors.

2.6.2 Quality of reserves estimates

In addition to providing information concerning an RI's activities, reserves reconciliations can provide insight into the quality of reserves estimates. In particular, the technical revisions reserve change category can provide insight over time as to whether or not estimates are meeting the certainty levels for proved and proved plus probable reserves. This is discussed in section 5.4.3 of volume 1 of the COGE Handbook. Specifically, positive and negative technical revisions are generally attributed

to better or poorer reservoir performance, respectively, than initially forecast. For a given entity, if reserves have been determined in accordance with the certainty levels described in section 5.4.3, proved reserves should be adjusted positively over time, while proved plus probable reserves should remain relatively constant.

Figure 9 illustrates technical revisions for each group of RIs for 2014 through 2016 for gross proved reserves (in total) and gross proved plus probable reserves (in total).

Figure 9a Technical revisions for gross proved reserves (in total)

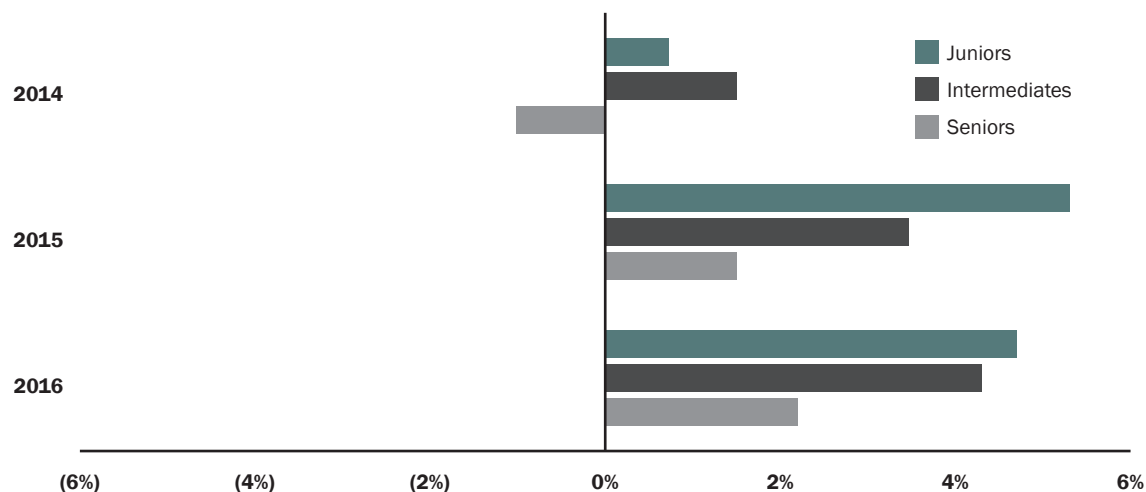
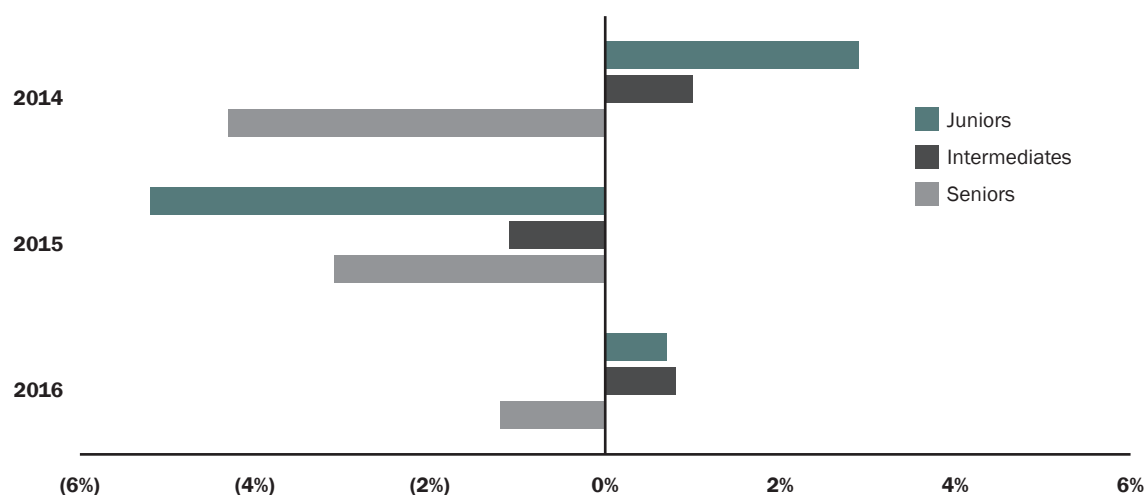


Figure 9b Technical revisions for gross proved plus probable reserves (in total)



While a long-term analysis regarding the quality of reserves data cannot be conducted due to the limited data set, some preliminary conclusions can be drawn. Although the reserves quality varies for individual RIs within each group, the estimates appear to be high quality overall for the period 2014 through 2016, with gross proved reserves (in total) adjusted positively over time and gross proved plus probable (in total) estimates remaining relatively constant. These reserves appear to have been

determined in accordance with the certainty levels described in section 5.4.3 of the COGE Handbook. An improving trend in technical revisions is noticeable for gross proved plus probable reserves (in total), with negative technical revisions decreasing over the three years. The ASC will continue to pay particular attention to negative technical revisions in future disclosure reviews.

3. Topics of interest

3.1 Introduction

The following information about current topics of interest is drawn from staff observations and interactions with capital market participants including RIs, independent qualified reserves evaluators or auditors and legal professionals. The information is not exhaustive; there is more available for consideration in NI 51-101, its related forms and companion policy, various staff notices and the COGE Handbook.

3.2 Pricing assumptions

Items 2.1(1) and 2.1(2) of Form 51-101F1, along with Form 51-101F2, require disclosure of reserves data attributed to specified categories of reserves, prepared using forecast prices and costs. Reserves data is defined in section 1.1 of NI 51-101 as an estimate of proved reserves and probable reserves and related future net revenue, estimated using forecast prices and costs. Estimates of reserves data therefore include volumes and net present values of future net revenue. Reserves is defined in section 1.1 of NI 51-101 as proved, probable or possible reserves.

Forecast prices and costs are defined in section 1.1 of NI 51-101 as future prices and costs that are:

- (a) generally accepted as being a reasonable outlook of the future;
- (b) if, and only to the extent that, there are fixed or presently determinable future prices or costs to which the reporting issuer is legally bound by a contractual or other obligation to supply a physical product, including those for an extension period of a contract that is likely to be extended, those prices or costs rather than the prices and costs referred to in subparagraph (a).

Forecast prices and costs are discussed in section 1.1(2) of 51-101CP, which states, regarding the requirement for them to be “a reasonable outlook of the future”:

The CSA do not consider that future prices or costs would satisfy this requirement if they fall outside the range of forecasts of comparable prices or costs used, as at the same date, for the same future period, by major *independent qualified reserves evaluators or auditors* or by other reputable sources appropriate to the evaluation.

A forecast is an estimate by definition. Estimates have uncertainty which varies depending on the confidence in the estimate. Staff is of the view that forecast prices and costs should represent best estimates. Appendix A of volume 1 of the COGE Handbook defines best estimate as the value derived by an evaluator using deterministic methods that best represents the expected outcome with no optimism or conservatism. If probabilistic methods are used, there should be at least a 50 per cent probability (P_{50}) that the quantities actually recovered will equal or exceed the best estimate.

Item 2.1(3) of Form 51-101F1 requires disclosure of specified elements of future net revenue disclosed under item 2.1(2). This disclosure is to be estimated using forecast prices and costs.

Future net revenue is defined in NI 51-101 as a forecast of revenue, estimated using forecast prices and costs or constant prices and costs, arising from the anticipated development and production of resources, net of the associated royalties, operating costs, development costs, and abandonment and reclamation costs.

Item 2.2 of Form 51-101F1 permits reserves data disclosed under item 2.1 to be supplemented with disclosure of reserves, resources other than reserves, or both, determined using constant prices and costs.

Item 2.2 of states regarding disclosure of estimates prepared using constant prices and costs:

For this purpose,

- (a) *a constant price is,*
 - (i) *if the reporting issuer is legally bound to supply the product at a particular price, that price; or*
 - (ii) *in every other case, the price that is the unweighted arithmetic average of the first-day-of-the-month price for that product for each of the 12 months preceding the effective date; and*
- (b) *the costs to be used are to be reasonably estimated on the basis of existing economic conditions without escalation or adjustment for inflation.*

Part 3 of Form 51-101F1 discusses required disclosure regarding pricing assumptions used in estimates of reserves data disclosed in Form 51-101F1. Item 3.2 states:

1. For each *product type*, disclose:
 - (a) the pricing assumptions used in estimating *reserves data* disclosed in response to Item 2.1:
 - (i) for each of at least the following five financial years; and
 - (ii) generally for subsequent periods; and
 - (b) the *reporting issuer's* weighted average historical prices for the most recent financial year.
2. The disclosure in response to section 1 must include the benchmark reference pricing schedules for the countries or regions in which the *reporting issuer* operates, and inflation and other forecast factors used.
3. If the pricing assumptions specified in response to section 1 were provided by a *qualified reserves evaluator or auditor* who is independent of the *reporting issuer*, disclose that fact and identify the *qualified reserves evaluator or auditor*.

Contingent resources data is defined in section 1.1 of NI 51-101 as:

- (a) an estimate of the volume of contingent resources, and
- (b) the risked net present value of future net revenue of contingent resources.

Prospective resources data is defined in section 1.1 of NI 51-101 as:

- (a) an estimate of the volume of prospective resources, and
- (b) the risked net present value of future net revenue of prospective resources.

If contingent resources data and prospective resources data are disclosed as an appendix to Form 51-101F1, part 7 of Form 51-101F1 requires the disclosure to be prepared using forecast prices and costs. Additionally, Form 51-101F2 requires the same for disclosed estimates of contingent resources data and prospective resources data.

Item 7.3(1) of Form 51-101F1 requires disclosure of the forecast pricing assumptions used in estimating contingent resources data and prospective resources data disclosed under item 7.1, for each of the five years following the most recently completed financial year. Item 7.3(3) requires the pricing assumptions included in item 7.3(1) to be the same as those disclosed under part 3 of Form 51-101F1. Supplemental disclosure of contingent resources data determined using constant prices and costs is permitted under item 7.4.

Both qualified reserves evaluators and qualified reserves auditors, along with RIs, are reminded of their respective responsibilities related to the determination and disclosure of prices and costs, including volumes, future net revenues and pricing assumptions. These responsibilities are accepted through the signing of the reports prepared in accordance with:

- Form 51-101F2 by qualified reserves evaluators or auditors, which represents that they have obtained reasonable assurance as to whether the reserves data, contingent resources data and prospective resources data are free of material misstatement; and
- Form 51-101F3 by the RI's management and directors, which represents their approval of the content and filing of Form 51-101F1, the filing of the report prepared in accordance with Form 51-101F2 and the content and filing of the report prepared in accordance with Form 51-101F3.

In addition, RIs are reminded that their disclosure must not be misleading, per section 92(4.1) of the *Securities Act* (Alberta). Please also refer to section 2(a)(i)(A) of CSA SN 51-327 for additional information.

Figures 10a and 10b depict historical and forecast prices for West Texas Intermediate (**WTI**) and Henry Hub natural gas, respectively. These are major crude oil and natural gas benchmarks in North America. Both figures also include forecasts from the U.S. Energy Information Administration (**EIA**), the 2017 Canadian federal budget, the 2017 Alberta provincial budget and a forecast created by averaging forecasts published by three major Canadian independent qualified reserves evaluators or auditors (**Evaluator average**).

Figure 10a West Texas Intermediate forecast price comparison

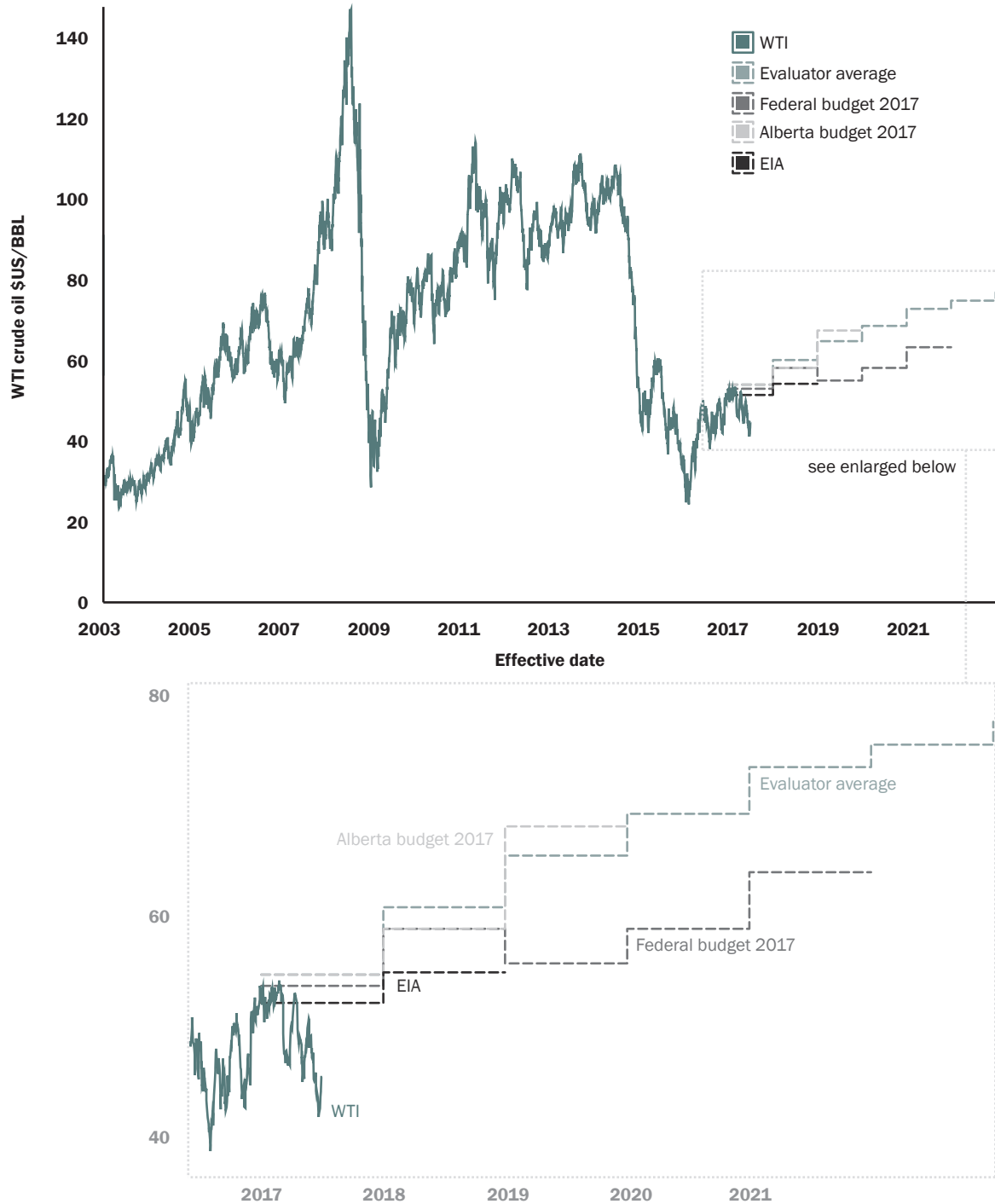
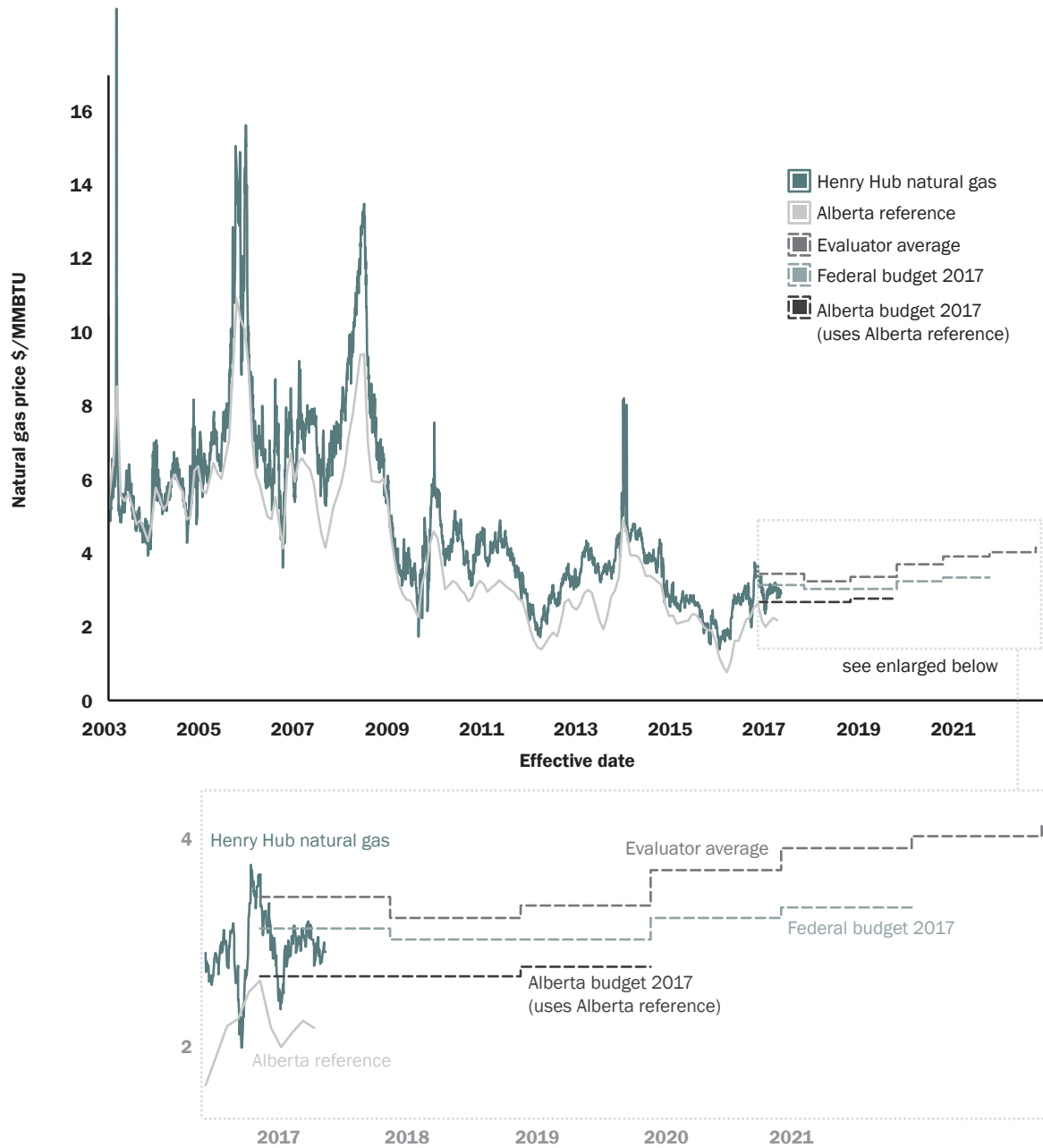


Figure 10b Henry Hub natural gas forecast price comparison



3.3 “Commercial” and “commerciality”

Staff frequently observe the terms “commercial” and “commerciality” in oil and gas disclosure. Their usage is often inconsistent with the definition of the term “commercial” contained in CSA SN 51-324:

When a *project* is commercial this implies that the essential social, environmental, and economic conditions are met, including political, legal, regulatory, and contractual conditions. Considerations with regard to determining commerciality include:

- economic viability of the related development project;
- a reasonable expectation that there will be a market for the expected sales quantities of production required to justify development;
- evidence that the necessary production and transportation facilities are available or can be made available;
- evidence that legal, contractual, environmental, governmental, and other social and economic concerns will allow for the actual implementation of the recovery project being evaluated;
- a reasonable expectation that all required internal and external approvals will be forthcoming. Evidence of this may include items such as signed contracts, budget approvals, and approvals for expenditures, etc.
- evidence to support a reasonable timetable for development. A reasonable time frame for the initiation of development depends on the specific circumstances and varies according to the scope of the project. Although five years is recommended as a maximum time frame for classification of a project as commercial, a longer time frame could be applied where, for example, development of economic projects are deferred at the option of the producer for, among other things, market-related reasons or to meet contractual or strategic objectives.

By definition, reserves are commercial, while resources other than reserves are sub-commercial, as they aren’t considered to be commercially recoverable due to the existence of one or more contingencies. This is discussed in sections 5.2 and 5.3.3 of volume 1 of the COGE Handbook.

The term “commercial” appears in section 5.9(2) of NI 51-101, which discusses disclosure of anticipated results from an estimate of volume or value of resources not currently classified as reserves in which the RI has an interest, or intends to acquire an interest. Section 5.9(2)(d)(iii.1) requires a description of the applicable project or projects including:

- (A) the estimated total cost required to achieve commercial production;
- (B) the general timeline of the project, including the estimated date of first *commercial production*;

In both instances, the definition of commercial from CSA SN 51-324 applies.

The defined term also applies to use of the term “commerciality” in section 5.9(2)(d)(v), which discusses the requirement for cautionary statements proximate to estimates of anticipated results of resources not currently classified as reserves, and section 5.16(2), which discusses restrictions regarding the summation of resource categories.

Regarding chance of commerciality, section 5.3.3 of volume 1 of the COGE Handbook states that the likelihood that a project will achieve commerciality is referred to as the “chance of commerciality.”

Chance of commerciality is defined in CSA SN 51-324 as the product of the chance of discovery and the chance of development. The term is discussed in section 2.7(4.1) of 51-101CP.

3.4 Mechanical updates

Staff often observe disclosure of estimates from mechanical updates of evaluations. This disclosure tends to occur in prospectuses, news releases and investor presentations. In most situations, the disclosure represents the RI’s effort to provide more recent oil and gas information than contained in their statement of reserves data and other information specified in Form 51-101F1. Section 5.2(7) of 51-101CP states regarding mechanical updates:

So-called “mechanical updates” of *reserves* and *resources* other than *reserves* reports are sometimes created, often by rerunning previous *evaluations* with a new price deck. This is problematic since there may have been material changes other than price that may result in the report being misleading. If a *reporting issuer* discloses the results of the mechanical update it should ensure that all relevant material changes are also disclosed so that the information is not misleading.

In addition to updated pricing, staff sometimes observe other adjustments, such as the downward revision of reserves estimates to account for production that has occurred since the effective date of the evaluation. However, mechanical updates do not typically account for changes that reflect production performance, changes in operating costs and capital costs and development timing, to name a few. As a result, disclosure related to mechanical updates has the potential to be misleading.

In addition, the representation of a mechanical update of an evaluation as an evaluation is misleading. CSA SN 51-324 defines evaluation in relation to reserves data or resources other than reserves, as the process whereby an economic analysis is made of a property to arrive at an estimate of a range of net present values of the estimated future net revenue resulting from the production of the reserves or resources other than reserves associated with the property.

Since RIs must ensure that their disclosure is not misleading, if an RI intends to disclose information related to a mechanical update, it must ensure that any warranted adjustments have been accounted for. This assurance can likely only result from an evaluation being conducted. Due to the risk of misleading disclosure, staff strongly discourage disclosure from mechanical updates.

4. Petroleum Advisory Committee

The Petroleum Advisory Committee (**PAC**) is an important source of information and advice for the ASC. PAC is comprised of volunteer members (**Members**) drawn from the oil and gas and related industries and appointed to three-year terms. Meetings are normally held three times per year and attended by Members, observers and select ASC staff. PAC's mandate is to:

- review and provide opinions and advice on issues and current developments regarding the
 - evaluation of oil and gas reserves and resources other than reserves, and
 - disclosure related to oil and gas activities;
- comment on current and proposed Alberta securities laws and regulatory policies in this area; and
- provide advice to staff on an informal basis.

Topics discussed in the last year include the disclosure of product types, pricing assumptions and costs, and the current update to the COGE Handbook.

The ASC thanks the Members for their contribution.

Current Members:

Caralyn P. Bennett, P.Eng.
GLJ Petroleum Consultants Ltd.

David P. Carey, P.Eng., MBA
Retired

Harry Helwerda, P.Eng., FEC
Retired

Dr. John Lacey, P.Eng.
John R. Lacey International Ltd.

Keith McCandlish, P.Geol., P.Geo.
DMT Geosciences Ltd.

Ian McDonald, P.Eng.
Nexen Energy ULC

Jeff Meunier, P.Eng.
RBC Capital Markets

Rob Morgan, P.Eng.
Cona Resources Ltd.

James Surbey, B.Eng., LLB
Birchcliff Energy Ltd.

Philip A. Welch, P.Eng.
McDaniel & Associates Consultants Ltd.

John Zahary, P.Eng.
Altex Energy Ltd.

5. Contact information

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