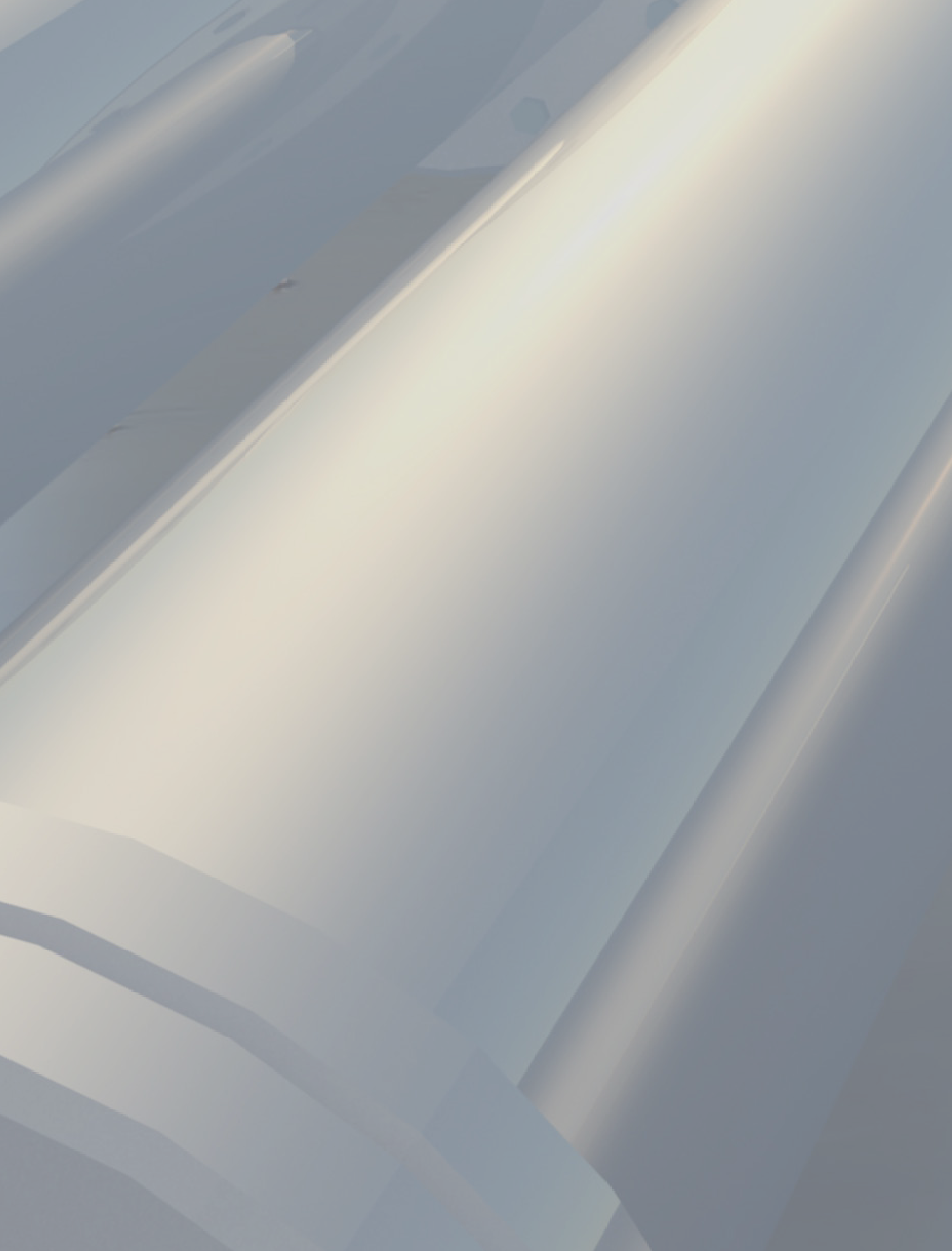
DECEMBER 2019

Oil and Gas Review

Alberta Securities Commission



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Investors must have access to timely and accurate information.

The Alberta Securities Commission is the lead oil and gas regulator within the Canadian Securities Administrators and we are proud to work with this sector.

The cornerstone of a fair and efficient capital market is high-quality corporate disclosure. It provides valuable information that builds investor confidence and enables them to make informed decisions. The oil and gas industry is an important economic driver for all of Canada, and it continues to experience significant market access, pricing, regulatory and policy challenges. Now, more than ever, it is critical that investors receive transparent, timely and accurate information about the opportunities and risks facing corporate issuers.

This oil and gas review is prepared annually by the ASC's Petroleum group within the Corporate Finance division. This group is comprised of experienced and knowledgeable oil and gas professionals who understand the industry and its current challenges. They are dedicated to assisting reporting issuers in meeting their requirements and to protecting investors through their compliance oversight efforts.

With the unprecedented circumstances continuing in Alberta's capital markets, our objective with this review is to provide useful and straightforward information that makes it easier for reporting issues to achieve effective disclosure. Our Corporate Finance division is here to assist you. Please feel free to contact me or my colleagues identified in this report with any feedback or questions. We welcome the opportunity to connect with you.

Regards,

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

1. Introduction

1.1 GENERAL

The Alberta Securities Commission (**ASC**) administers Alberta's securities laws and is the lead regulator on oil and gas matters within the Canadian Securities Administrators (**CSA**), the umbrella group of Canada's securities regulators. Alberta's securities laws are established under the *Securities Act* (Alberta), which is designed to ensure that the province's capital market operates fairly and efficiently. To achieve this, investors must have access to timely, effective and compliant disclosure that is balanced, authentic, relevant and reliable. The ASC's Petroleum group is responsible for ASC's oversight of:

- The review of oil and gas disclosure and associated evaluations from issuers that report under National Instrument 51-101 *Standards of Disclosure For Oil and Gas Activities* (**NI 51-101**).
- The development and maintenance of oil and gas disclosure requirements and policy.
- Communication with capital market participants on oil and gas matters.

Published annually, the Oil and Gas Review (**Report**) provides information about:

- oil and gas disclosure from reporting issuers (**RIs**) engaged in oil and gas activities
- quality of reserves estimates
- Alberta's capital market
- select oil and gas regulatory topics
- Petroleum group activities

Under section 2.1 of NI 51-101, RIs are required to file the following with the securities regulatory authority 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**)
- 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*
- Form 51-101F5 *Notice of Ceasing to Engage in Oil and Gas Activities*

NI 51-101 sets out both the general disclosure standards and specific annual disclosure requirements for RIs engaged in oil and gas activities. Per NI 51-101, oil and gas disclosure must be prepared in accordance with the Canadian Oil and Gas Evaluation Handbook (**COGE Handbook**), which is maintained and distributed by the Society of Petroleum Evaluation Engineers (SPEE) (Calgary Chapter) (www.speecanada.org). The COGE Handbook is amended from time to time. RIs are responsible for ensuring that their disclosure complies with changes upon publication. An amended COGE Handbook was published in October 2019.

1.2 EXECUTIVE SUMMARY

The ASC's Petroleum group reviews general and required annual disclosure for compliance with securities regulations, specifically NI 51-101 and related forms. While oil and gas disclosure is generally compliant, this Report contains observations and analyses concerning key areas identified by staff for improvement, along with general commentary and statistics about Alberta's capital market, commentary on the quality of reserves estimates, information regarding select regulatory topics, and activities conducted by the Petroleum group.

Areas identified for improvement are based primarily on reviews of 2019 disclosure representing oil and gas activities conducted in 2018. These involve:

- **Development timing for undeveloped reserves**
  - Disclosure regarding item 5.1 of Form 51-101F1, which requires discussion of plans (including timing) for developing proved undeveloped and probable undeveloped reserves.
- **Production**
  - Disclosure is required by each product type produced and measured at the first point of sale.
- **Type wells (type curves)**
  - Representations of production performance over time and related information, used by stakeholders to estimate such things as production, recoverable volumes and cash flows.
- **Reserves reconciliations**
  - Disclosure regarding item 4.1 of Form 51-101F1, which requires annual disclosure of changes in reserves estimates.

The select oil and gas regulatory topics include:

- ownership and disclosure in Form 51-101F1
- disclosure of product types and by-products
- availability of funding

1.3 YEAR IN REVIEW

The Petroleum group's 2019 activities included:

- The review of oil and gas disclosure and the evaluation of oil and gas reserves and resources other than reserves from issuers that report under NI 51-101.
- The maintenance of oil and gas disclosure requirements and policy.
- Communication with capital market participants.

Staff conducted 195 screening reviews of the required annual oil and gas filings (138 for RIs principally regulated by the ASC and 57 for RIs principally regulated by other Canadian jurisdictions). Staff also conducted 15 press release reviews, nine prospectus reviews, a number of technical reviews, and participated in 38 continuous disclosure reviews. Further information on review types is contained in section 3.1 of this Report.

Regarding the ongoing maintenance of oil and gas disclosure requirements and policy, staff assisted the SPEE (Calgary Chapter) in the maintenance of the COGE Handbook, leading to the publication of an update in October 2019.

As part of its commitment to communicating with capital market participants, the ASC published the 2018 edition of the Oil and Gas Review Report in December 2018. It was also emailed to more than 1,000 subscribers. In February 2019, staff hosted the annual NI 51-101 Oil and Gas Review Information Session, consisting of an in-person seminar and simultaneous webinar. These were attended by 149 and 77 registrants, respectively. Each seminar attendee was provided with a copy of the 2018 edition of the Oil and Gas Review Report. See https://asc.ca/news-and-publications/events for more information concerning future seminars and webinars.

Between October 2018 and the end of September 2019, the Petroleum group responded to 37 inquiries pertaining to NI 51-101 matters. These included 18 from RIs, six from legal firms, 11 from independent qualified reserves evaluators and auditors, and one each from an investment bank and an independent consultant.

Petroleum staff delivered presentations and participated in panel discussions at five external events in Calgary, Lake Louise, Houston and Geneva during 2019. These were attended by almost 600 oil and gas, financial and other professionals.

We understand the difficult situation currently faced by many capital market participants. Please let us know how we can help. The Petroleum group can be reached at your convenience through the contact information located in section 7 of this Report.

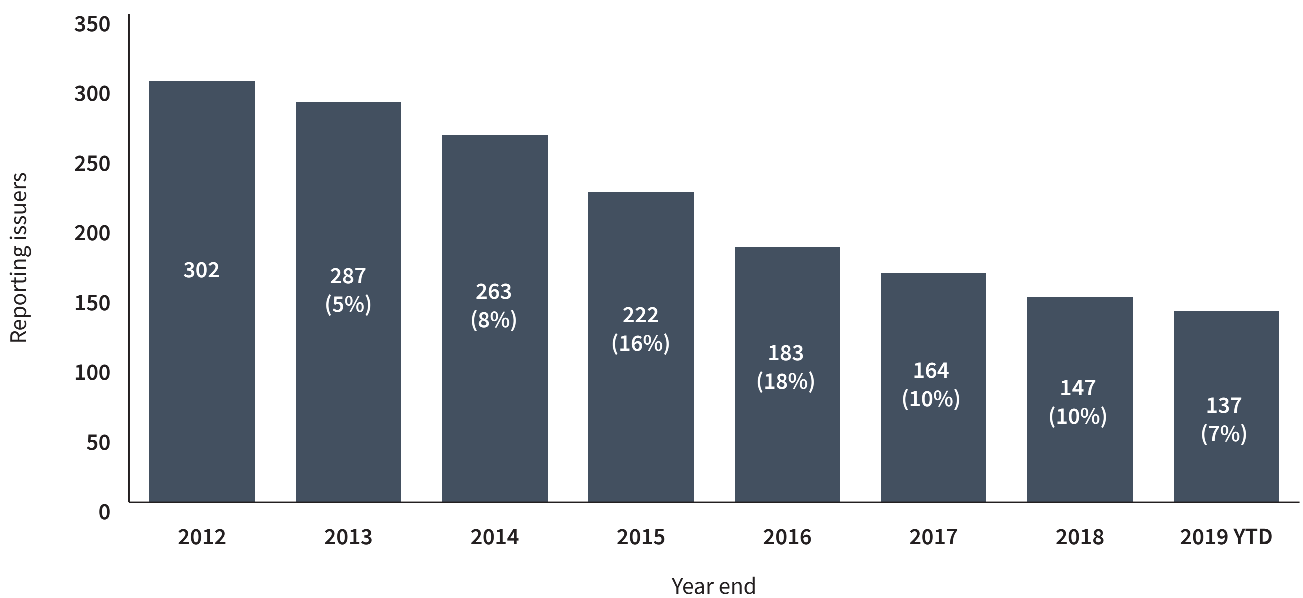
2. Oil and gas in the Canadian capital market

In recent years, the Canadian oil and gas industry has experienced increased regulatory, political, environmental and social scrutiny. This scrutiny has resulted in:

- protracted development schedules for oil and gas reserves
- delays and cancellations of transportation and other infrastructure development
- reduced investor interest
- scarce investment capital

Consequently, there has been a steady decrease in the number of RIs engaged in oil and gas activities. Illustrating this, Figure 1 shows there were 147 RIs principally regulated by the ASC that were actively engaged in oil and gas activities at the end of 2018, down from 302 at the end of 2012. By the end of September 2019, there were 137, representing an almost 55 per cent decrease since 2012.

Figure 1: Number of oil and gas RIs principally regulated by the ASC



As shown in Figure 2, this reduction in RIs has disproportionately affected smaller RIs, with the tally of intermediate and senior RIs remaining relatively static. The percentage of junior RIs to total RIs has decreased from 80 per cent in 2014 to 65 per cent at the end of September 2019. To construct this figure, RIs were grouped as follows using production disclosure per item 6.9 of Form 51-101F1:

- seniors >100,000 barrels of oil equivalent (**BOE**) per day (based on a conversion ratio of six thousand cubic feet of gas for one barrel of oil)
- intermediates 10,000 to 100,000 BOE per day
- juniors <10,000 BOE per day

Figure 2: Number of oil and gas RIs principally regulated by the ASC by RI group

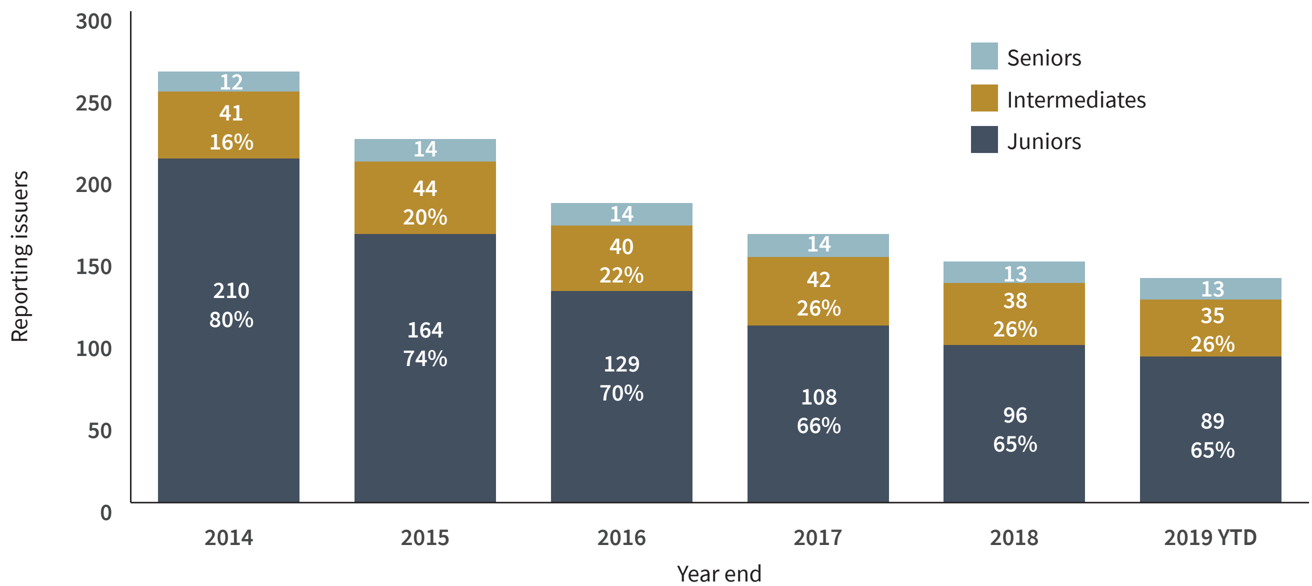


Figure 3 on the following page categorizes the reasons for the decrease in RIs from the end of 2018 to the end of September 2019 by RI group. As shown, the majority of changes in RI count are attributed to junior RIs.

Figure 3: Net change in oil and gas RIs principally regulated by the ASC by RI group

NUMBER OF REPORTING ISSUERS				REASON FOR CHANGE
Seniors	Intermediates	Juniors	TOTAL	
–	(1)	(2)	(3)	CCAA/receivership/bankruptcy
–	(2)	(1)	(3)	privatized/acquired by a company not principally regulated by the ASC
–	–	(1)	(1)	acquired by an RI principally regulated by the ASC
–	–	(5)	(5)	Cease Trade Order
–	–	2	2	new RI
–	**(3)**	**(7)**	**(10)**	

Figure 4 shows the amount of capital raised through prospectus offerings by RIs principally regulated by the ASC from 2016 through the end of September 2019. The offerings included common shares, units, debentures, convertible debentures, rights, subscription receipts and notes.

Figure 4: Capital raised by prospectus offerings and number of prospectus offerings by oil and gas RIs principally regulated by the ASC

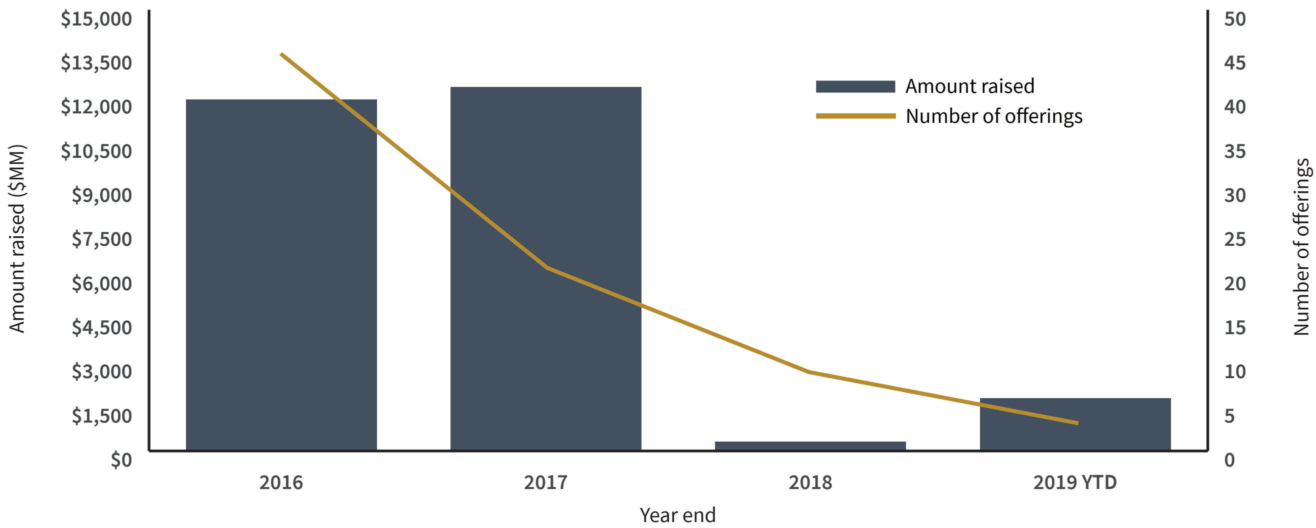


Figure 5 illustrates the number of occurrences of disclosure of contingent resources data and prospective resources data in the statement of reserves data and other information specified in Form 51-101F1, from 2014 to 2018, inclusive. Disclosure occurrences have been flat in recent years, following a large decrease in 2015. Disclosure of resources other than reserves is generally optional and tends to fluctuate in frequency with investors' interest in the information.

Figure 5: Disclosure occurrences of contingent resources data and prospective resources data by RIs principally regulated by the ASC

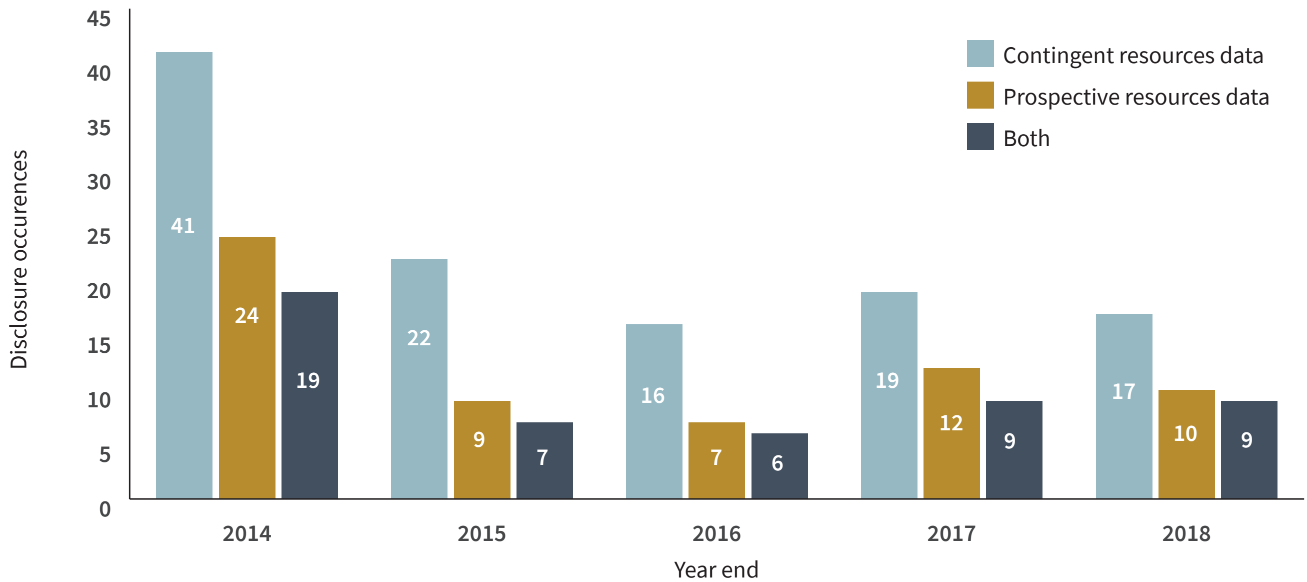


Figure 6 illustrates the information shown in Figure 5 by RI group.

Figure 6: Disclosure occurrences of contingent resources data and prospective resources data by RIs principally regulated by the ASC by RI group

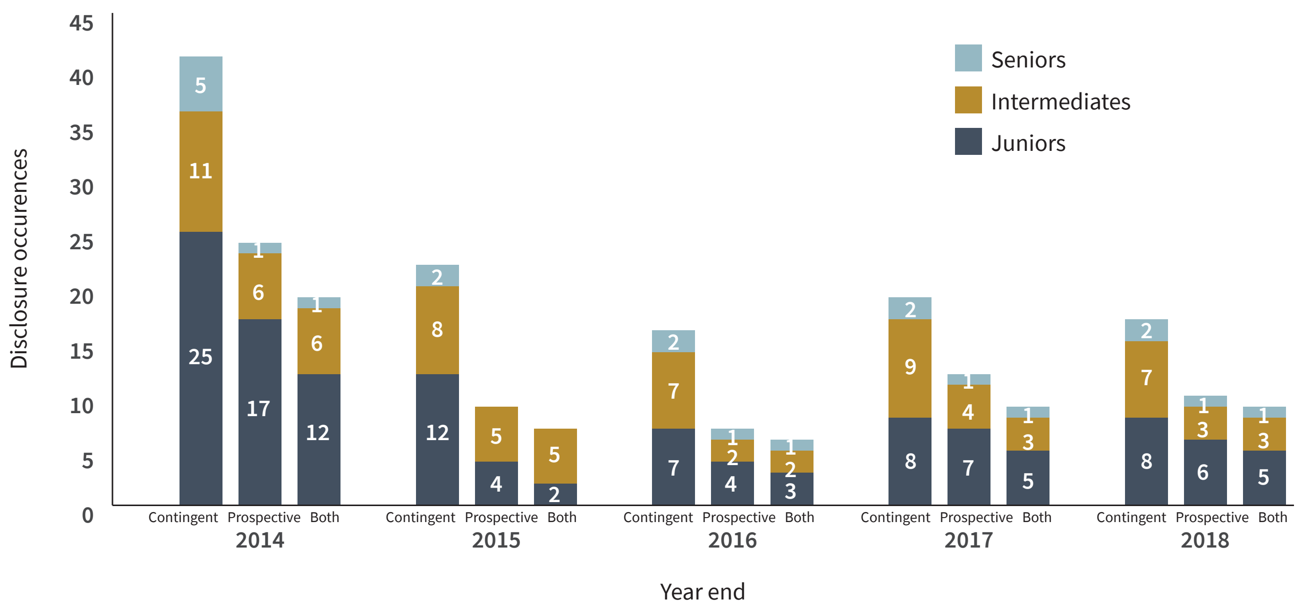
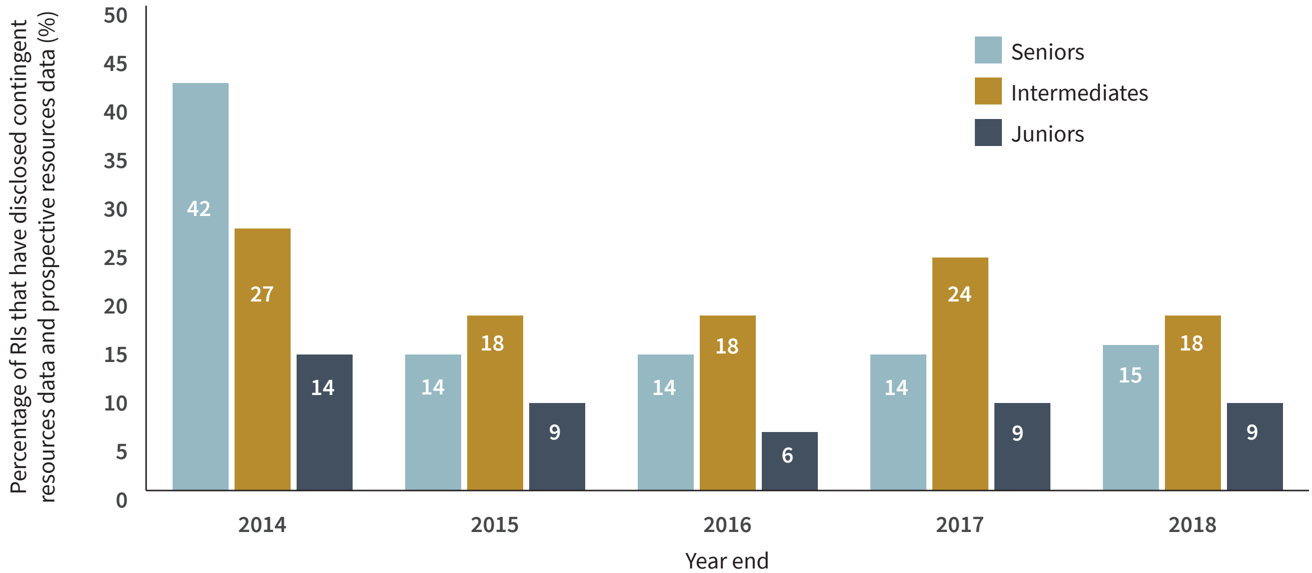


Figure 7 illustrates the percentage of RIs principally regulated by the ASC that disclosed contingent resources data and prospective resources data in the statement of reserves data and other information specified in Form 51-101F1, from 2014 to 2018, inclusive. As shown, the disclosure percentage has typically been highest from the intermediates, and lowest from the juniors.

Figure 7: Percentage of RIs principally regulated by the ASC that have disclosed contingent resources data and prospective resources data



3. Disclosure commentary

This section discusses key areas of disclosure Petroleum staff have identified for improvement. It incorporates observations and analyses drawn primarily from the reviews of 2019 disclosure attributed to oil and gas activities conducted in 2018. In its role as the lead regulator on oil and gas matters within the CSA, the ASC has a rigorous review process to assess compliance with oil and gas securities requirements. While this process primarily focuses on RIs principally regulated by the ASC, staff routinely review disclosure from other Canadian RIs engaged in oil and gas activities. The type of review conducted will often determine specifically what will be reviewed. Disclosure reviewed may include that required by section 2.1 of NI 51-101 (the statement of information specified in Form 51-101F1 and related reports), prospectuses, management discussion and analysis, press releases, investor presentations, websites, and evaluations of oil and gas reserves and resources other than reserves.

The Petroleum group conducts such reviews as:

- **Screening**
  - incorporates annual filings, which includes the statement of information specified in Form 51-101F1, and reports in accordance with Form 51-101F2 and Form 51-101F3
  - may evolve into technical or continuous disclosure reviews (see below)
- **Press release**
  - incorporates other disclosure, as required

  - may evolve into technical or continuous disclosure reviews

- **Technical**
  - incorporates evaluations of reserves and resources other than reserves and associated disclosure
  - may evolve into continuous disclosure reviews

- **Continuous disclosure**
  - incorporates all oil and gas disclosure
  - initiated by the ASC Corporate Finance division

- **Prospectus**
  - includes short-form, long-form (IPO) and shelf
  - incorporates other disclosure, as required

Specific circumstances help determine the outcome of each review, which 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
  - issuer placed in default
  - management cease trade order
  - cease trade order
  - referral to the ASC Enforcement division

RIs that are uncertain whether their disclosure is compliant with NI 51-101, the COGE Handbook or, more generally, the *Securities Act* (Alberta), are encouraged to seek the advice of an appropriate professional advisor.

Please note that 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 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*.

3.1 DEVELOPMENT TIMING FOR UNDEVELOPED RESERVES

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

Item 5.1 of Form 51-101F1 specifies disclosure concerning proved undeveloped reserves and probable undeveloped reserves disclosed under item 2.1. This includes the first attributed volumes in each of the most recent three financial years for both and the basis for their attribution, development plans and, if applicable, the reasons for deferring development beyond two years.

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 required discussion must be meaningful and specific to the RI's circumstances. Disclosure reviewed by staff is often general and unspecific, lacking detail that would enable a reader to adequately understand an RI's development plans and, if applicable, the reasons for deferring development beyond two years.

The COGE Handbook discusses development timing for undeveloped reserves. Section 1.4.7.2.1.8 states:

> For Undeveloped Reserves, development should normally proceed within five years **unless there is appropriate justification with adequate explanation**. The evaluator should review Undeveloped Reserves estimates if development has not proceeded as the operator had previously planned.
>
> For large projects, where significant capital is required for field development or infrastructure construction, significant capital expenditures should commence within three years for assignment of Proved Undeveloped Reserves. For the assignment of Probable Undeveloped Reserves, significant capital spending should commence within five years.

This section also provides examples of situations in which it may be appropriate to exceed this development timing guidance. These involve such circumstances as ongoing resource play development, gas processing facilities and in situ, bitumen mining and offshore projects.

However, in the absence of compelling rationale provided in the evaluation itself, staff expect development timing to be aligned with the guidance provided above. If compelling rationale is used to justify development timing guidance, it may be appropriate to include it within the disclosure required by items 5.1(1)(b) and 5.1(2)(b). It may also be appropriate to include it within the 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 disclosed in Form 51-101F1.

Furthermore, CSA Staff Notice 51-324 *Revised Glossary to NI 51-101 Standards of Disclosure for Oil and Gas Activities* (**CSA SN 51-324**) states per the definition of the term “commercial”:

> […] 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. *[COGE Handbook]*

When evaluations are reviewed by staff, support documentation is sought if development timing exceeds COGE Handbook guidance. An absence of clear documentation may result in an evaluation being considered not to have been prepared in accordance with the COGE Handbook. Disclosure of information from such an evaluation would not be permitted.

EXAMPLE THAT DID NOT MEET OUR EXPECTATIONS

The company plans to develop its undeveloped reserves over the next three to five years. Timing may change based upon factors such as commodity prices, availability of capital, access to processing facilities and transportation, regulatory approval and new reservoir data.

Staff’s concerns with this disclosure include:

- *It does not differentiate proved undeveloped reserves and probable undeveloped reserves, as required by item 5.1.*
- *It is not meaningful and specific to the circumstances of the RI, such that it would enable a reasonable investor to assess the efforts made by the RI to convert undeveloped reserves to developed reserves, as noted in instruction (2) of item 5.1.*
- *The reasons for development of the proved undeveloped reserves and probable undeveloped reserves being deferred beyond two years are absent. This disclosure is required by item 5.1.*
- *The factors that may impact development timing appear to be those that directly influence project commerciality. A project must be commercial for reserves to be assigned or to remain assigned. Staff are concerned that reserves may have been inappropriately assigned, as the factors cited may impact commerciality.*

EXAMPLE THAT MET OUR EXPECTATIONS

The company plans to develop all of its proved undeveloped reserves over the next two years. These reserves are attributed to the company's ABC and DEF properties. The majority of its probable undeveloped reserves are attributed to its ABC, DEF and GHI properties and are scheduled to be developed over the next five years. The remaining probable undeveloped reserves are attributed to the JKL property and are scheduled to be developed within seven years. Approximately 50 per cent of the company's probable undeveloped reserves are expected to be developed within the next two years. The remainder have been deferred beyond two years due to the availability of processing capacity within the company-owned 123 facility and higher-priority opportunities.

3.2 PRODUCTION

Concern: Incorrect disclosure of production in press releases and investor presentations.

Specific concerns include:

- fluid types disclosed instead of required product types measured at the first point of sale
- quantities not measured at the first point of sale, as required
- certain product types and their respective quantities excluded
- product type ratios disclosed instead of the required quantity of each product type
- BOE disclosed unaccompanied by the constituent product types and their respective quantities measured at the first point of sale, as required

While items 6.8 and 6.9 of Form 51-101F1 discuss the respective disclosure of production estimates and production history, production disclosure outside of Form 51-101F1 is addressed more generally in NI 51-101 and related documents.

CSA SN 51-324 defines production as:

> The cumulative quantity of *petroleum* that has been recovered at a given date. [*COGE Handbook*] Recovering, gathering, treating, field or plant processing (for example, processing *gas* to extract *natural gas liquids*) and field storage of *oil* and *gas*.
>
> The *oil* production function is usually regarded as terminating at the outlet valve on the *lease* or field production storage tank. The *gas* production function is usually regarded as terminating at the plant gate. In some circumstances, it may be more appropriate to regard the production function as terminating at the first point at which *oil, gas* or their by-products are delivered to a main pipeline, a common carrier, a refinery or a marine terminal.

Section 5.4 of NI 51-101 states:

> 1. Disclosure of resources or of sales of *product* types or associated *by-products* **must be made with respect to the *first point of sale***.
> 2. Despite subsection (1), a *reporting issuer* may disclose *resources* or **sales of *product types* or associated *by-products*** with respect to an *alternate reference point* if, to a reasonable person, the *resources, product types* or associated *by-products* would be **marketable** at the *alternate reference point*. […]

Furthermore, section 5.5 states:

> Disclosure of *product types* or *by-products*, including *natural gas liquids* and sulphur must be made in respect only of volumes that have been or are to be recovered prior to the *first point of sale*, or an *alternate reference point*, as applicable.

Section 1.1 of NI 51-101 defines product type to mean any of the following:

(a) *bitumen;*
(b) *coal bed methane;*
(c) *conventional natural gas;*
(d) *gas hydrates;*
(e) *heavy crude oil*;
(f) *light crude oil* and *medium crude oil* combined;
(g) *natural gas liquids;*
(h) *shale gas;*
(i) *synthetic crude oil;*
(j) *synthetic gas;*
(k) *tight oil;*

As defined in section 1.1, by-product means:

> [A] substance that is recovered as a consequence of *producing* a *product type;*

First point of sale is defined in section 1.1 as:

> [T]he first point after initial *production* at which there is a transfer of ownership of a *product type*;

CSA SN 51-324 defines marketable as:

> In respect of *reserves* or **sales** of *oil, gas* or associated *by-products*, the volume of *oil, gas* or associated *by-products* measured at the point of sale to a third party, or of transfer to another division of the issuer for treatment prior to sale to a third party. For *gas*, this may occur either before or after the removal of *natural gas liquids*. For *heavy crude oil* or *bitumen*, this is before the addition of diluent.

In summary, disclosed production must include each product type and respective quantity measured at the first point of sale. This can be supplemented with additional information, but particular care must be taken to ensure that the disclosure is not misleading. For example, if natural gas liquids-rich shale gas were produced, it would be inappropriate to disclose product type shale gas **and** product type natural gas liquids unless the natural gas liquids were recovered prior to the first point of sale. If they weren't, the marketable quantity would be product type shale gas, albeit with a higher energy content due to the presence of entrained natural gas liquids. However, if the minimum disclosure requirements are met, staff would not object to an RI also disclosing estimated quantities of natural gas liquids or individual hydrocarbon components, such as butanes, pentanes plus and condensates expected to be recovered beyond the first point of sale.

If an RI discloses production but excludes certain product types, it must ensure that the disclosure is not misleading. For example, staff would likely object to the disclosure of a quantity of product type natural gas liquids if the disclosure is not accompanied by the quantity of product type shale gas from which the natural gas liquids are recovered, if there are marketable quantities of each at the first point of sale. The fact that an RI may not want to draw attention to the potentially lower value shale gas does not relieve the RI of its responsibility to ensure that its disclosure isn't misleading.

EXAMPLE THAT DID NOT MEET OUR EXPECTATIONS

The company's property averaged 5,000 bbl/d of natural gas liquids.

Staff's concern with this disclosure is that it excludes information concerning product type natural gas from which the natural gas liquids are recovered as a by-product.

EXAMPLE THAT MET OUR EXPECTATIONS

The company's property averaged 5,000 bbl/d of natural gas liquids and 50 MMcf/d of shale gas.

EXAMPLE THAT DID NOT MEET OUR EXPECTATIONS

Recent production from the property averaged 100 barrels of natural gas liquids per MMcf of gas.

Staff's concern with this disclosure is that if an RI discloses a ratio of produced product types, such as barrels of product type natural gas liquids per MMcf of product type shale gas, the quantities of each product type must also be disclosed in the same document.

EXAMPLE THAT MET OUR EXPECTATIONS

Recent production from the property averaged 100 barrels of natural gas liquids per MMcf of gas. The property produced an average of 5,000 bbl/d of natural gas liquids and 50 MMcf/d of shale gas.

EXAMPLE THAT DID NOT MEET OUR EXPECTATIONS

Q3 production averaged 17,500 BOE/d from the company's Canadian properties, up five per cent from Q2 using a conversion of six mcf of gas to one barrel of oil.

Staff's concern with this disclosure is that if an RI chooses to disclose a quantity of production using BOE, it must also disclose the constituent product types and their individual quantities within the same document.

EXAMPLE THAT MET OUR EXPECTATIONS

Q3 production averaged 17,500 BOE/d from the company's Canadian properties, up five per cent from Q2 using a conversion of six mcf of gas to one barrel of oil. Production consisted of 50 MMcf/d of shale gas, 5,000 bbl/d of natural gas liquids, 4,000 bbl/d of heavy crude oil and 1,000 mcf/d of conventional natural gas.

3.3 TYPE WELLS

Concern: Incorrect or inadequate disclosure of type wells (type curves) and related information.

Specific concerns involve:

- preparation and methodology
- absence of the applicable terminology and category
- absence of the effective date for the information, which is required
- clarity regarding whether the information was prepared or audited
    - by a qualified reserves evaluator or auditor, as required
    - in accordance with the COGE Handbook, as required
    - consistency with previous disclosure

With respect to the evaluation of resources, a type well represents production performance over a period of time for an average well with specified characteristics. Ideally, a type well is constructed by averaging historic production and forecast production estimates from wells situated in similar reservoirs and drilled and completed in a similar manner. The resulting production profile represents an outcome for a well or drilling location with similar reservoir, drilling and completion characteristics, which can be used to estimate such things as:

- production performance
- recoverable volumes classified using the applicable category (with its related recovery uncertainty) set out in the COGE Handbook
- profitability indicators such as cash flows

Type wells and related information is used by:

- qualified reserves evaluators and auditors to evaluate and audit resources, including determination of production estimates for non-producing wells and assessing such things as drilling locations, wells with minimal production history, production performance for currently producing wells and analogies
- RIs to assist with various investment and business decisions and value conveyance
- investors and creditors for decision making

Evaluations of reserves and resources other than reserves have increasingly incorporated type wells and related information, such as recoverable volumes and related future net revenue. In turn, press releases, prospectuses, investor presentations and other disclosure have increasingly incorporated this information.

With respect to disclosure per NI 51-101, type wells and related information may be analogous information, defined in section 1.1 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;*

Section 5.8 of Companion Policy 51-101CP *Standards of Disclosure of Oil and Gas Activities* (**51-101CP**) makes clear that the CSA considers analogous information to extend to include an RI's area of interest:

> A *reporting issuer* may wish to base an estimate on, or include comparative *analogous information* for their area of interest, such as *reserves, resources,* and *production*, from *fields* or wells, in nearby or geologically similar areas.

Preparation

The preparation of type wells is discussed extensively in chapter 2 of the COGE Handbook. Additionally, section 5.8 of 51-101CP states:

> Particular care must be taken in using and presenting this type of information. […] Using only the best wells or *fields* in an area, or ignoring dry holes, for instance, may be particularly misleading. It is important to present a factual and balanced view of the information being provided.

The disclosure of analogous information is discussed in section 5.10 of NI 51-101. Section 5.10(1) states that regarding disclosure of analogous information about an area outside the area in which an RI has an interest or intends to acquire an interest:

> Sections 5.2, 5.3, 5.9 and 5.16 do not apply to the disclosure of *analogous information* provided that the *reporting issuer* discloses the following:
>
> (a) the source and date of the *analogous information*;
>
> (b) whether the source of the *analogous information* was *independent*;
>
> (c) if the *reporting issuer* is unable to confirm that the *analogous information* was prepared by a *qualified reserves evaluator or auditor* or in accordance with the *COGE Handbook*, a cautionary statement to that effect proximate to the disclosure of the *analogous information*;
>
> and
>
> (d) the relevance of the *analogous information* to the reporting issuer's oil and gas activities.

Section 5.10(2) considers analogous information in the context of an area in which an RI has or intends to acquire an interest, which includes the disclosure of anticipated results. The term "anticipated results" is defined in section 1.1 of NI 51-101 as:

> [I]nformation 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;

Section 5.10(2) states:

> For greater certainty, if 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.

Regarding this, section 5.8 of 51-101CP states:

> […] if the *reporting issuer* discloses an estimate of its own *reserves* or *resources* other than *reserves* based on an extrapolation from the *analogous information*, or if the *analogous information* itself is an estimate of its own *reserves* or *resources*, the *reporting issuer* must ensure the estimate is prepared in accordance with the *COGE Handbook* and disclosed in accordance with *NI 51-101* generally. […]

Applicable terminology and category

Section 5.3(1) of NI 51-101 discusses the use of the applicable terminology and category in the disclosure of estimates of volumes and related future net revenue and states:

> *Reserves* or *resources* other than *reserves* must be disclosed using the applicable terminology and category set out in the *COGE Handbook* and must be classified in the most specific *category* of *reserves* or *resources* other than *reserves* in which the *reserves* or *resources* other than *reserves* can be classified.

Effective date

Disclosure of the effective date of an estimate is required by:

- Section 5.2(1)(a)(i) for reserves and other information of a type specified in Form 51-101F1.
- Section 5.9(2)(d)(ii) for anticipated results from resources other than reserves that includes an estimate of a quantity in which the RI has or intends to acquire an interest or an estimated value attributable to an estimated quantity.

Use of a qualified reserves evaluator or auditor

All disclosure must be prepared or audited by a qualified reserves evaluator or auditor, as discussed in:

- Section 5.2(1)(a)(ii) for reserves and other information of a type specified in Form 51-101F1.
- Section 5.9(2)(a) for anticipated results from resources other than reserves that includes an estimate of a quantity in which the RI has or intends to acquire an interest or an estimated value attributable to an estimated quantity.

There is no direct requirement to ***confirm*** that disclosure of reserves and resources other than reserves has been prepared or audited by a qualified reserves evaluator or auditor. Instead, sections 5.2(2) and 5.9(4) require an RI to disclose if the estimates were prepared by an ***independent*** qualified reserves evaluator or qualified reserves auditor. However, voluntary confirmation of this in disclosure will eliminate the likelihood that an RI will be contacted by staff for clarification.

Use of the COGE Handbook

All disclosure must be prepared or audited in accordance with the COGE Handbook, as discussed in:

- Section 5.2(1)(a)(iii) for reserves and other information of a type specified in Form 51-101F1.
- Section 5.9(2)(b) for anticipated results from resources other than reserves that includes an estimate of a quantity in which the RI has or intends to acquire an interest or an estimated value attributable to an estimated quantity.

Although there is no requirement to ***confirm*** that disclosure has been prepared or audited in accordance with the COGE Handbook, voluntary confirmation of this in disclosure will eliminate the likelihood that an RI will be contacted for clarification.

Consistency with previous disclosure

Sections 5.2 and 5.9 contain additional requirements relating to the disclosure of reserves and resources other than reserves, respectively. For example, if an RI discloses that type well results exceed expectations, the RI must ensure that the disclosure complies with sections 5.2(1)(d) and 6.1 of NI 51-101. The RI should also ensure that its disclosure is accompanied with information clarifying the context and relevance of the disclosure. To ensure it is balanced, the RI must include a discussion of results that do not meet expectations, while adhering to sections 5.2(1)(d) and 6.1. Drawing attention to positive results while ignoring or downplaying negative results may be misleading. Section 5.2(1)(d) of NI 51-101 addresses consistency of reserves and other information with previous disclosure:

> [T]he disclosure must be consistent with the corresponding information, if any, contained in the statement most recently filed by the *reporting issuer* with the *securities regulatory authority* under item 1 of section 2.1, except to the extent that the statement has been supplemented or superseded by a report of a material change filed by the *reporting issuer* with the *securities regulatory authority*.

More generally, material change from information filed under section 2 of NI 51-101 is discussed in section 6.1 of NI 51-101:

> 1. This Part applies in respect of a material change that, had it occurred on or before the *effective date* of information included in the statement most recently filed by a *reporting issuer* under item 1 of section 2.1, would have resulted in a significant change in the information contained in the statement.
> 2. In addition to any other requirement of *securities legislation* governing disclosure of a material change, disclosure of a material change referred to in subsection (1) must discuss the *reporting issuer's* reasonable expectation of how the material change has affected its *reserves* data or other information.

Therefore, an RI's disclosure must be materially consistent with disclosure contained in the statement required by section 2.1(1) of NI 51-101 or an appendix to the statement, unless supplemented or superseded by a report of a material change filed with the securities regulatory authority. This disclosure may include type well results and associated information.

Consideration must also be given as to whether results conform to the certainty levels attributed to the category of recoverable volumes associated with the initial estimate. If estimation and classification is done appropriately, long-term results should not vary from the certainty levels attributed to the estimates.

EXAMPLE THAT DID NOT MEET OUR EXPECTATIONS

The company's most recent well in the property is the fifth put on production in the fourth quarter. It has been onstream for 60 days and production is significantly exceeding type curve expectations and may outperform the five bcf forecast.

Staff's concerns with this disclosure include:

- *Results are discussed for only one of the five wells put on production; the disclosure isn't balanced and may be misleading.*
- *A limited amount of production data is provided; results may not be indicative of longer term performance.*
- *The categories of reserves or resources other than reserves associated with the type well are absent, contravening section 5.3 of NI 51-101; inclusion provides the certainty level of an estimate, assisting a reader in understanding the significance of results relative to an initial estimate.*
- *Based on the information provided and excluded, it doesn't appear that the type well has been prepared or audited:*
  - *in accordance with the COGE Handbook, as required by sections 5.2(1)(a)(iii) and 5.9(2)(b) of NI 51-101*
  - *by a qualified reserves evaluator or auditor, as required by section 5.2(1)(a)(iii) and 5.9(2)(b) of NI 51-101*
- *There is no indication whether the estimate was prepared or audited by an **independent** qualified reserves evaluator or auditor, as required by section 5.2(2) for reserves and section 5.9(4) for anticipated results from resources that are not currently classified as reserves or the estimate of a quantity of resources other than reserves.*

EXAMPLE THAT DID NOT MEET OUR EXPECTATIONS

The company's type well for the play indicates an EUR of 1,535 MBOE with exceptional economics.

Staff's concerns with this disclosure include:

- *No information is provided regarding the categories of reserves or resources other than reserves associated with the type well, as required by section 5.3 of NI 51-101; "EUR" isn't an acceptable substitute.*
- *Based on the information provided, it is unclear whether the estimate has been prepared or audited:*
  - *in accordance with the COGE Handbook, as required by sections 5.2(1)(a)(iii) and 5.9(2)(b) of NI 51-101*
  - *by a qualified reserves evaluator or auditor, as required by section 5.2(1)(a)(iii) and 5.9(2)(b) of NI 51-101*
- *There is no indication whether the estimate was prepared or audited by an **independent** qualified reserves evaluator or auditor, as required by section 5.2(2) for reserves and section 5.9(4) for anticipated results from resources that are not currently classified as reserves or the estimate of a quantity of resources other than reserves.*
- *No information is provided to support the statement that the play has "exceptional economics" and could therefore be considered misleading.*

3.4 RESERVES RECONCILIATIONS

Concern: Incorrect disclosure regarding item 4.1 of Form 51-101F1, which requires disclosure of an annual reserves reconciliation.

Specific concerns include:

- mismatched opening and closing balances
- negative volumes for reserve change categories that cannot have negative volumes
- erroneous technical revisions
- erroneous reserves additions and reductions through acquisitions and dispositions, due to the use of incorrect dates
- incorrect production volumes
- missing or inconsistent units of measure
- incorrect reserve change categories
- an absence of explanations regarding disclosure in each reserve change category

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 disclosure is required by country, product type specified in item 4.1(2)(b) and reserve change category specified in item 4.1(2)(c). In addition, item 4.1(2)(c) requires an explanation concerning disclosure that occurs in each reserve change category.

Product types specified in item 4.1(2)(b) are:

(i) *bitumen*;
(ii) *coal bed methane*;
(iii) *conventional natural gas*;
(iv) *gas hydrates*;
(v) *heavy crude oil*;
(vi) *light crude oil* and *medium crude oil* combined;
(vii) *natural gas liquids*;
(viii) *shale gas*;
(ix) *synthetic crude oil*;
(x) *synthetic gas*;
(xi) *tight oil*;

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 included in extensions and improved recovery or in a separate reserve change category labelled “infill drilling.”

The required 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. This is the “opening balance” of the reconciliation. The “closing balance” is the result of this comparison.

Effective date is defined in section 1.1 of NI 51-101 as:

> [T]he date as at which, or for the period ended on which, the information is provided;

Guidance regarding reserves reconciliations is provided in section 4.6.2 of the COGE Handbook.

Staff note the following common disclosure deficiencies with respect to the reserves reconciliation required by item 4.1:

- **Opening balance** – Volumes for the current year don't match the previous year's closing balance for the same country, product type and reserves category. 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 4.6.2.4 of the COGE Handbook. There cannot be negative volumes in these categories.
- **Technical revisions** – The erroneous recording of negative volumes that exceed 100 per cent of the opening balance. It is impossible to remove a volume in excess of the opening balance through a technical revision. Section 2.7(6)(c) of 51-101CP states regarding technical revisions:

  > Technical revisions show changes in existing reserves estimates, in respect of carried-forward *properties*, over the period of the reconciliation […] and are the result of new technical information, not the result of capital expenditure.

- **Acquisitions** – The use of incorrect dates to account for reserves additions through acquisitions. As stated previously, reserves are reconciled at the effective date for the current financial year. Consistent with this, section 2.7(6)(c) of 51-101CP states that the date to reconcile changes in acquired reserves is the effective date, which 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.

  The term "acquisition date" is not defined nor clarified in NI 51-101 and related forms, 51-101CP or staff notices. However, staff consider it to mean the date at which the RI has attained a direct or indirect ownership, working or royalty interest in reserves. Ownership is discussed in section 1.4.4.2 of the COGE Handbook.

  Reserves estimates that originate from activity occurring on an acquired property subsequent to the acquisition date of the reserves and prior to the effective date of the RI's most recent financial year, other than due to production, are to be accounted for in the appropriate reserve change category. These changes would typically occur through the drilling or recompletion of a well and related activities. The results would be reflected in reserve change categories extensions and improved recovery, discoveries or infill, not reserve change category acquisitions, with the reasons for the change provided in a footnote. Staff suggest that these explanations be considered alongside the previously noted explanations required by item 4.1(2)(c).

  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.
  - The production by product type that has occurred from the acquisition, accrued from the date ownership was attained to the effective date for the current financial year.

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

The individual steps to prepare the required reconciliation are:

1. Evaluate all of the RI's reserves at the effective date of the RI's most recent financial year. This evaluation will include properties acquired during the most recent financial year.
2. Determine the RI's share of the gross production volume, by product type, derived from acquired properties. This includes production that has occurred from the date that ownership of the properties was attained to the effective date of the most recent financial year.
3. Add the results from step 2 to those from step 1. This exercise is mechanical and is not impacted by estimates that may exist from an evaluation of the acquired reserves at or around the date that ownership of the reserves was attained.
4. Enter the results from step 3 into the reconciliation table under reserve change category acquisitions adjacent to the appropriate product type.
5. Reserves estimates originating from activity occurring on the acquired property (typically the drilling or recompletion of a well or related activities) subsequent to attainment of ownership and prior to the effective date of the most recent financial year, are not accounted for under reserve change category acquisitions. They are instead entered in the appropriate reserve change category.

- **Dispositions** – The use of incorrect dates to account for reserves reductions through dispositions. As discussed in section 4.6.2 of the COGE Handbook, disposed reserves are recorded at the disposition date, which is the date at which ownership by the RI has ceased. Production that has occurred between the last day of the preceding financial year and the disposition date is accounted for under reserve change category production.
- **Production** – Volumes don't match those disclosed under item 6.9(1)(a) of Form 51-101F1 for the same country and product type. Unless production from entities that don't have reserves assigned is included, these are expected to match. If they do not match, an explanation as to why must be provided.
- **Closing balance** – Volumes don't match those disclosed for the same country, product type and reserves category 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), which advises against switching between Imperial units and Système International (SI) units without a 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 of Form 51-101F1. An RI must use the specified categories and, if necessary, explain unusual circumstances. Please note that although section 4.6.2.2 of the COGE Handbook provides recommended "change categories" (equivalent to "reserve change categories"), not all change categories have equivalent reserve change categories.
- **Explanations** – The absence of details accompanying disclosure in individual reserve change categories. Item 4.1(2)(c) of Form 51-101F1 requires separate identification and explanation of disclosure in each reserve change category. Without explanations, changes may occur that can't be easily understood. An example of this include a scenario in which a large technical revision, an acquisition, or a re-categorization of reserves occurs (for example, probable reserves to proved reserves). In the absence of an explanation, the re-categorization could go unnoticed if the proved plus probable reserves (in total) otherwise remains 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. Remember, the opening balance of the reserves reconciliation is equivalent to the estimates at the last day of the preceding financial year, known as the closing balance. If an RI had reserves at the effective date of the preceding financial year, but a reserves evaluation is not available, there will not be reserves estimates available for the opening balance. As a zero opening balance is not appropriate in such a situation, a reconciliation cannot be undertaken. Instead, the RI must disclose the reason for the absence of the reconciliation.

Additional information concerning preparation of the reserves reconciliation is provided in 51-101CP. Section 2.7(6)(a) discusses a scenario in which an RI has reserves at the effective date for its current financial year, but had no reserves at the start of the financial year (at which time the RI was presumably engaged in oil and gas activities). If the added reserves are material to the RI, a reconciliation must be disclosed. In these situations, the opening balance is zero because the RI did not have reserves at the start of the financial year, not because the RI had reserves but no available evaluation, as discussed previously. Section 5.10(4) of 51-101CP discusses reserves reconciliations with respect to initial public offerings.

4. Insight into reserves estimates

Analysis of an RI's reserves estimates and their variability can provide insight into activities undertaken by the RI and the quality of their initial and current estimates. Assessment of the mandated annual reserves reconciliation, required to be disclosed per item 4.1 of Form 51-101F1, is instrumental in this effort. For example, an RI's efforts in pursuit of new reservoirs or expansions to, and increased recoveries from, existing reservoirs can be assessed through disclosure in the reserve change categories "discoveries" and "extensions and improved recovery," respectively. The quality of reserves estimates can be judged through a review of disclosure in reserve change category "technical revisions," for example. This can ascertain whether or not estimates have been meeting the certainty levels for particular reserves categories and are therefore in accordance with the COGE Handbook. This process of "reserves validation" is described in section 4.6.1 of the COGE Handbook. With appropriate sampling and analysis, insights into activities and reserves quality can also be determined for groups of issuers that report under NI 51-101.

Figure 8 (on the following page) presents a series of reserves reconciliations that consist of changes in grouped and summed gross proved plus probable reserves (in total) disclosed by reserve change category by the constituent RIs. The RIs are principally regulated by the ASC and their disclosure reflects oil and gas activities primarily conducted in 2018. An RI's contribution to its respective group reconciliation is based solely on the reserves volumes it has disclosed in each reserve change category.

While generalized, these reconciliations inform an assessment of the quality of reserves data disclosed by RIs of similar size through an understanding of the changes between the opening and closing balances of 2018 for each group of RIs. The following steps were taken to generate these reconciliations:

1. All oil and gas RIs principally regulated by the ASC were ranked by their annual average gross daily production volumes. These volumes were obtained from each RI's disclosure required by quarter, country and product type for their most recent financial year per item 6.9 of Form 51-101F1, and summed.
2. The ranked RIs were then grouped as follows:
   - seniors >100,000 BOE per day (based on a conversion ratio of six thousand cubic feet of gas for one barrel of oil)
   - intermediates 10,000 to 100,000 BOE per day
   - juniors <10,000 BOE per day
3. The highest ranked RIs were selected from each group, incorporating 10 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 for gross proved plus probable reserves (in total) were summed. No weighting or adjustment was undertaken.
5. The per cent change between the opening balance of 2018 (the closing balance of 2017) and the closing balance of 2018 was calculated. Figure 8 illustrates these results. Positive and negative changes fall to the right and left of the opening balance (denoted as 0 per cent), respectively.

Figure 8: 2018 Reconciliations of summed gross proved plus probable reserves (in total) by RIs principally regulated by the ASC by RI group

Figure 8a: Seniors

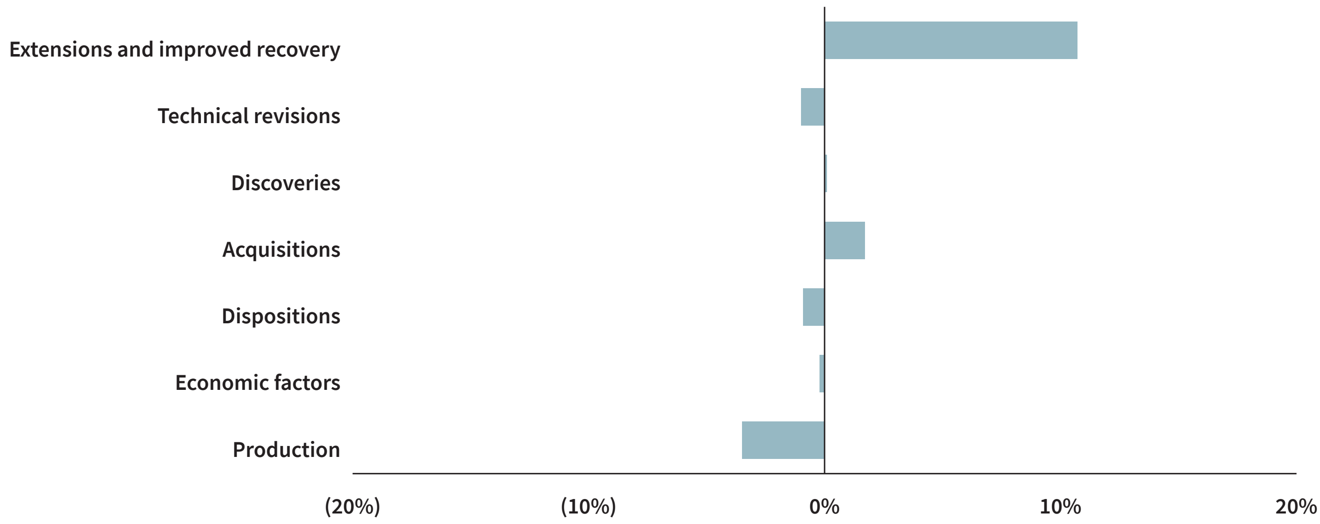


Figure 8b: Intermediates

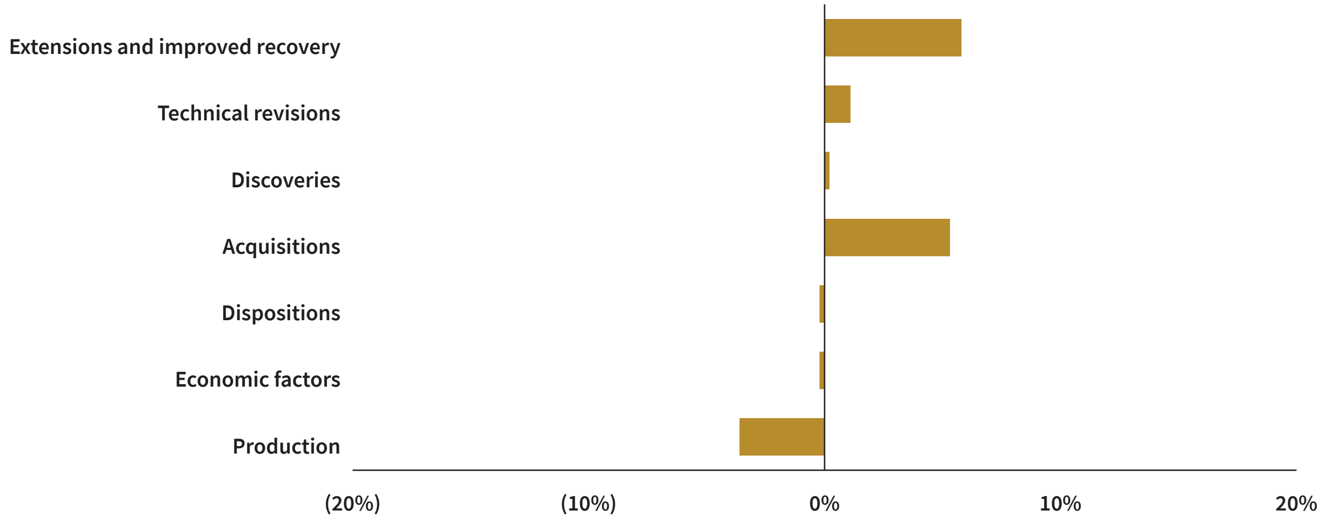
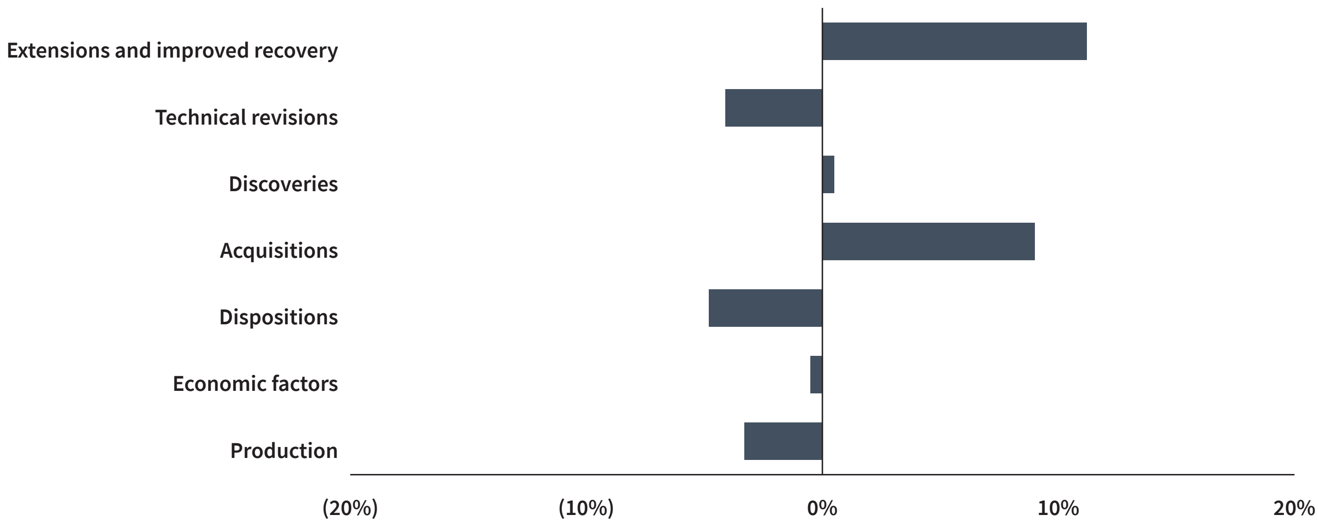


Figure 8c: Juniors



As illustrated in Figure 8, changes in extensions and improved recovery range from 6 per cent for the intermediates to 11 per cent for both the juniors and seniors. All seniors record extensions and improved recovery, with three accounting for 77 per cent of the change. All but two of the intermediates record extensions and improved recoveries, while 24 of the juniors do, with four accounting for more than two-thirds of the total.

Regarding technical revisions, positive and negative revisions are generally attributed to better or poorer reservoir performance, respectively, than initially forecast. For a given entity, proved reserves should be adjusted positively over time, while proved plus probable reserves should remain relatively constant. Technical revisions in Figure 8 are slightly negative for the seniors, slightly positive for the intermediates and negative 4 per cent for the juniors. One senior disproportionately influences the outcome, accounting for 42 per cent of the change, while one junior RI accounts for 21 per cent of the change for its group.

Discoveries are negligible for all groups, which is expected, due to the continuing shift away from exploratory activities in recent years and an increasing emphasis on other activities. As a result, the change in discoveries is limited to a small number of RIs in each category: One RI accounts for 100 per cent of the senior group's discoveries, three RIs account for all of the intermediate group's , including one that accounts for 84 per cent, while seven RI's account for all of the junior group's discoveries.

Changes in acquisitions are 2 per cent for the seniors, 5 per cent for the intermediates and 9 per cent for the juniors. One senior RI accounts for 59 per cent of the acquisitions for the group, while three account for 76 per cent for the intermediates. Six seniors, 11 intermediates and 43 juniors recorded acquisitions.

Changes in dispositions are negligible for the seniors and intermediates and negative 5 per cent for the juniors, with 15 RIs recording dispositions. Eight seniors and 12 intermediates recorded dispositions.

All three groups show small negative adjustments for economic factors.

Figures 9 through 11 (on the following pages) illustrate changes in the reserve change categories extensions and improved recovery, discoveries and technical revisions for each group of RIs from 2014 to 2018, inclusive. While generalized, the purpose is to illustrate the multi-year changes in each reserve change category.

Figure 9: Summed extensions and improved recovery for gross proved plus probable reserves (in total) by RIs principally regulated by the ASC by RI group

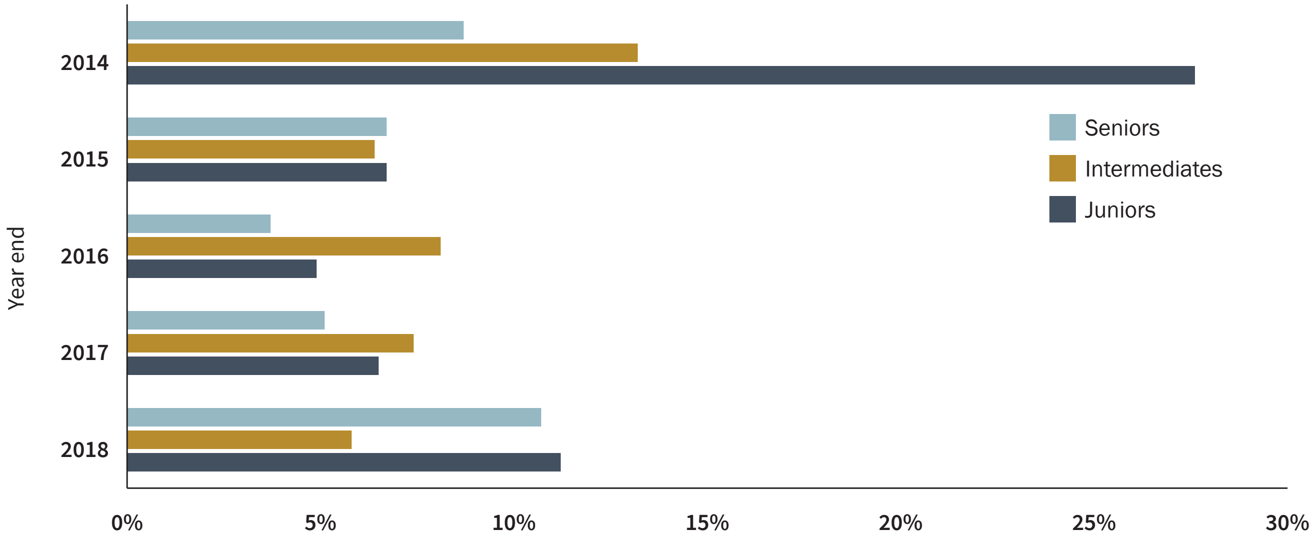


Figure 10 illustrates the continuing small percentage of proved plus probable reserves added within each group through discoveries.

Figure 10: Summed discoveries for gross proved plus probable reserves (in total) by RIs principally regulated by the ASC by RI group

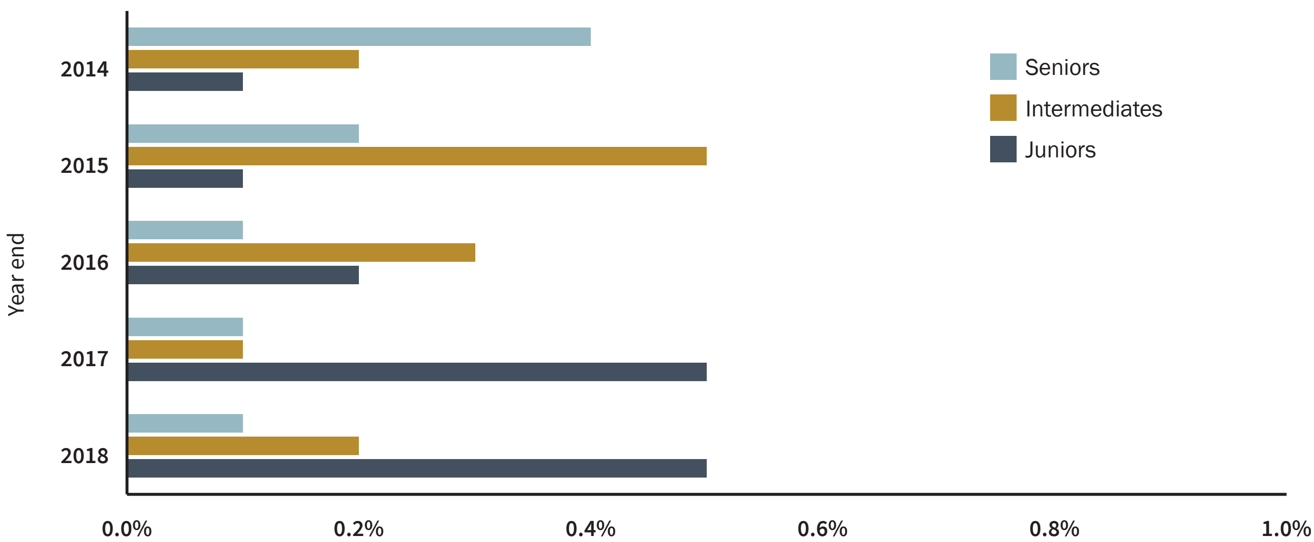
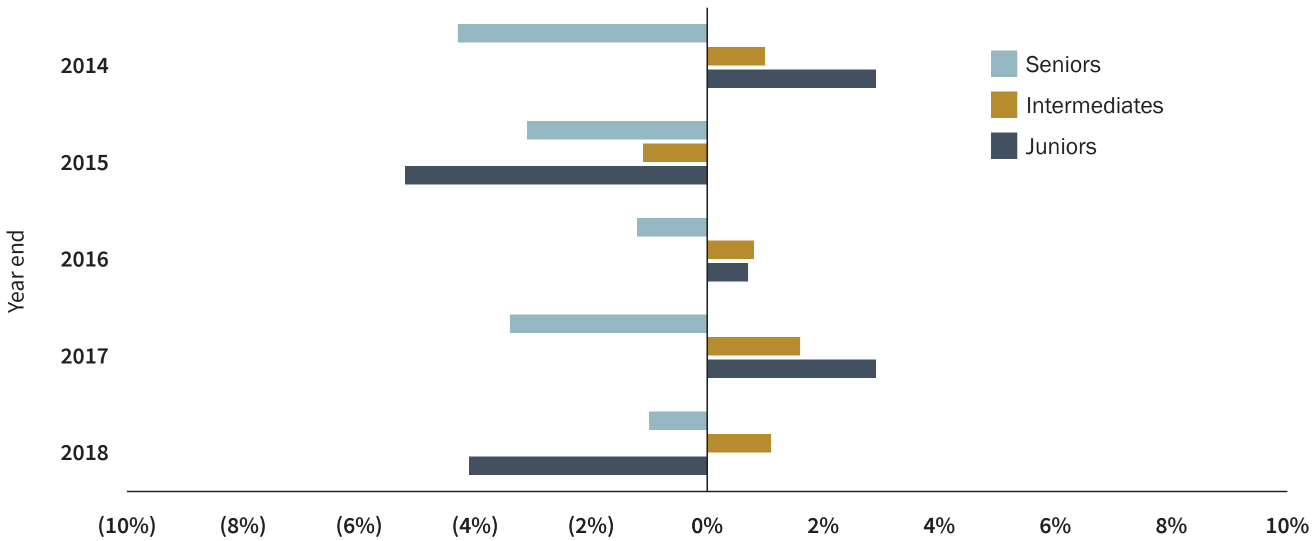


Figure 11 illustrates the multi-year average of the aggregated technical revisions for each group of RIs. Although the reserves quality varies for individual RIs within each group, the gross proved plus probable reserves (in total) have remained relatively constant for the juniors and intermediates and appear to approximate the associated certainty levels described in the COGE Handbook. The gross proved plus probable reserves (in total) for the seniors have been slightly negative for each of the years. This suggests that the certainty levels for proved plus probable reserves are not being met. The ASC will continue to pay particular attention to negative technical revisions in its future reviews of disclosure.

Figure 11: Summed technical revisions for gross proved plus probable reserves (in total) by RIs principally regulated by the ASC by RI group



5. Additional information worth noting

This section discusses select oil and gas regulatory topics, including ownership, product types and by-products, and availability of funding. These topics were chosen in an effort to provide helpful information to stakeholders and are not in response to any specific disclosure concerns. The information provided is not exhaustive. More is available for consideration in NI 51-101 and related forms, 51-101CP, various staff notices and the COGE Handbook. Please seek appropriate professional advice concerning this information.

5.1 OWNERSHIP AND DISCLOSURE IN FORM 51-101F1

Section 2.1(1) of NI 51-101 requires disclosure of a statement of the reserves data and other information specified in Form 51-101F1, as at the last day of the RI's most recent financial year and for the financial year then ended. This timing is reiterated in general instruction (2) and instruction (1) of item 1.1 of Form 51-101F1, both of which apply to all disclosure in Form 51-101F1, including reserves and resources other than reserves. Additionally, instruction (2) of item 1.1 states with respect to disclosure of reserves:

> *The same effective date applies to* ***reserves*** *of each category reported and to related* ***future net revenue****. References to a change in an item of information, such as changes in production or a change in* ***reserves****, mean changes in respect of that item during the year ended on the* ***effective date****.*

Instruction (4) of item 2.1 of Form 51-101F1 states regarding the ownership of or control over reserves disclosed in Form 51-101F1:

> *If the* **reporting issuer's** *disclosure of* **reserves** *would, to a reasonable person, be misleading, if stated without an explanation of the* **reporting issuer's** *ownership of or control over those* **reserves***, explain the nature of the* **reporting issuer's** *ownership of or control over* **reserves** *disclosed in the statement filed or to be filed under item 1 of section 2.1 of* **NI 51-101**.

Item 2.1 of Form 51-101F1 addresses the required disclosure of reserves, related future net revenue and elements of this future net revenue, for specified categories of reserves. Instruction (1) of item 2.1 states:

> *Disclose all of the* reserves *in respect of which the* reporting issuer *has a direct or indirect ownership, working or royalty interest*.

Part 7 addresses the optional disclosure of contingent resources data and prospective resources data as an appendix to Form 51-101F1. Instruction (4) of part 7 states:

> *If a* **reporting issuer's** *disclosure of* **contingent resources** *or* **prospective resources** *would, to a reasonable person, be misleading if not accompanied by an explanation of the* **reporting issuer's** *ownership of or control over those* **resources***, explain the nature of the* **reporting issuer's** *ownership of or control over all* **contingent resources** *and* **prospective resources** *disclosed in the statement filed or to be filed under item 1 of section 2.1 of* **NI 51-101**.

The concept of ownership is discussed in the COGE Handbook. In particular, section 3.2 states that all reports should:

> - contain a statement on the status of ownership, without which the information in the report may be misleading;
> - indicate why they were prepared; and
> - state the standard that was followed, if a standard was required for regulatory disclosure.

Considering disclosure more broadly, general instruction (5) of Form 51-101F1 states, regarding all disclosure in Form 51-101F1:

> *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 an RI chooses to provide additional information, it should:

- present it separately from the required disclosure
- make it less prominent than the related required disclosure
- accompany it with information necessary to clarify the RI's ownership or control

It is imperative that both RIs and independent qualified reserves evaluators or auditors understand their responsibilities as they pertain to an RI's annual filing requirements, including the RI's ownership of control over the reserves, contingent resources or prospective resources disclosed within. Specifically, as per section 2.1 of NI 51-101:

- RI responsibilities include:
  - The content and filing of a statement of the reserves data and other information specified in Form 51-101F1, as at the last day of the RI's most recent financial year and for the financial year then ended.
  - The filing of a report in accordance with Form 51-101F2, which is the report of the independent qualified reserves evaluator or auditor on the reserves data, contingent resources data or prospective resources data.
  - The content and filing of a report in accordance with Form 51-101F3, which is the report of management and directors on oil and gas disclosure.
- An independent qualified reserves evaluator or auditor is responsible for the execution of a report in accordance with Form 51-101F2, which represents in part that it has:
  - Audited, evaluated or reviewed the RI's reserves, contingent resources or prospective resources.
  - Carried out its efforts in accordance with standards set out in the COGE Handbook, as amended from time to time.

Key takeaways:

- All disclosure per Form 51-101F1 must be at the effective date of the RI's most recent financial year and for the financial year then ended.
- The RI must have a direct or indirect ownership, working or royalty interest in the reserves disclosed per item 2.1 of Form 51-101F1.
- If an RI's disclosure of reserves, contingent resources or prospective resources would, to a reasonable person, be misleading if not accompanied by an explanation of their ownership of or control, an explanation must be provided.
- An RI may provide additional information not required in Form 51-101F1, provided it is not misleading and does not omit material information required to be disclosed.
- RIs and independent qualified reserves evaluators or auditors must ensure they are aware of their respective responsibilities as they pertain to the RI's annual filing requirements.

5.2 DISCLOSURE OF PRODUCT TYPES AND BY-PRODUCTS

The application of NI 51-101 depends upon an understanding of product types and by-products and their relationship with oil and gas activities.

Section 1.1 of NI 51-101 states with respect to oil and gas activities:

> [O]il 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;

Regarding disclosure of oil and gas activities, section 1.3 states:

> This *Instrument* applies only to *reporting issuers* engaged, directly or indirectly, in *oil and gas activities*.

Regarding materiality and the applicability of NI 51-101, section 1.4 states:

> 1. This *Instrument* applies only in respect of information that is *material* in respect of a *reporting issuer*.
> 2. For the purpose of subsection (1), information 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*.

Concerning product types and NI 51-101, section 1.1 states:

> Product types means any of the following:
>
> (a) *bitumen;*
> (b) *coal bed methane;*
> (c) *conventional natural gas;*
> (d) *gas hydrates;*
> (e) *heavy crude oil*;
> (f) *light crude oil* and *medium crude oil* combined;
> (g) *natural gas liquids;*
> (h) *shale gas;*
> (i) *synthetic crude oil;*
> (j) *synthetic gas;*
> (k) *tight oil;*

While section 1.1 defines by-product to mean:

> [A] substance that is recovered as a consequence of *producing a product type*;

NI 51-101 specifically cites natural gas liquids, sulphur and solution gas as by-products. Sections 1.2.1, 1.2.3, 3.4.7, 3.4.8 and 3.4.9 of the COGE Handbook discuss by-products and variously include propane, butanes, pentanes plus (condensate), natural gas liquids, solution gas, sulphur, helium, water, hydrogen sulphide, carbon dioxide, nitrogen, coke and vanadium.

Specifically regarding the disclosure of product types and their by-products, section 5.4 of NI 51-101 states:

> 1. Disclosure of *resources* or of sales of *product type*s or associated *by-products* must be made with respect to the *first point of sale*.
> 2. Despite subsection (1), a *reporting issuer* may disclose *resources* or sales of *product types* or associated *by-products* with respect to an *alternate reference point* if, to a reasonable person, the *resources, product types* or associated *by-products* would be marketable at the *alternate reference point* [...]

While section 5.5 states:

> Disclosure of *product types* or *by-products*, including *natural gas liquids* and sulphur must be made in respect only of volumes that have been or are to be recovered prior to the *first point of sale*, or an *alternate reference point*, as applicable.

Key takeaways:

- NI 51-101 applies only to:
  - RIs engaged directly or indirectly in oil and gas activities.
  - Information material to an RI.
- Product types and their by-products are fundamental to oil and gas activities.
- An RI is not engaged in oil and gas activities and subject to NI 51-101 unless its activities concern product types and their by-products in a manner described in the definition of oil and gas activities.
- Product types and their by-products must be recovered prior to the first point of sale or an alternate reference point.
- Reserves and resources other than reserves and related future net revenue must be disclosed using the product types defined in section 1.1 of NI 51-101.
- Only by-products with a corresponding product type can have reserves and resources other than reserves and related future net revenue disclosed. This excludes:
  - propane
  - butanes
  - pentanes plus (condensate)
  - solution gas
  - sulphur
  - helium
  - water
  - hydrogen sulphide
  - carbon dioxide
  - nitrogen
  - coke
  - vanadium

5.3 AVAILABILITY OF FUNDING

Section 5.2(1)(a)(iv) of NI 51-101 states that if an RI makes disclosure of reserves or other information of a type that is specified in Form 51-101F1, the disclosed estimates of reserves or future net revenue must:

> [H]ave been made assuming that development of each *property* in respect of which the estimate is made will occur, without regard to the likely availability to the *reporting issuer* of funding required for that development;

In clarification, section 5.2(5) of 51-101CP states:

> In assigning *reserves* to an undeveloped *property*, the *reporting issuer* is not required to have the funding available to develop the *reserves*, since they may be developed by means other than the expenditure of the *reporting issuer's* funds (for example by a farm-out or sale). *Reserves* must be estimated assuming that development of the *properties* will occur without regard to the likely availability of funding required for that *property*.

Section 1.4.5 of the COGE Handbook states:

> The COGEH requires projects should be evaluated without considering the availability of funding to the operator since, even if not developed by the operator, the value may be realised by other means, such as sale or farm-out. However, such projects should be based on a consideration that the value will be realized in a reasonable time, and they should be clearly identified in a Resource report. A regulator may not allow the disclosure of a project for which the operator does not have the funding.

Furthermore, section 3.8 states:

> Asset evaluations are conducted without considering the availability of capital for funding projects.
>
> […] Capital from sources other than a company's cash flow can support development but, the development plan must be consistent with the company's ability to sustain development and the development plan.
>
> An asset also has value in the marketplace regardless of the company's cash position or ability to fund a development plan; therefore, it has value.

While disclosed estimates of reserves or future net revenue are required to be made without regard to the availability of the necessary funding, item 5.3 of Form 51-101F1 requires RIs to disclose specific information regarding the sources and costs of funding.

> 2. Discuss the *reporting issuer's* expectations as to:
>   (a) the sources (including internally-generated cash flow, debt or equity financing, farm-outs or similar arrangements) and costs of funding for estimated future *development costs*; and
>   (b) the effect of those costs of funding on disclosed *reserves* or *future net revenue*.
> 3. If the *reporting issuer* expects that the costs of funding referred to in section 2, could make development of a *property* uneconomic for that *reporting issuer,* disclose that expectation and its plans for the *property.*

Regarding this, section 5.2(5) of 51-101CP states:

> [I]tem 5.3 of *Form 51-101F1* requires a *reporting issuer* to discuss its expectations as to the sources and costs of funding for estimated future *development costs*. If the costs of funding would make development of a *property* unlikely, then even if *reserves* were assigned, the *reporting issuer* must discuss that expectation and its plans for the *property*.

In addressing disclosure with respect to availability of funding more broadly, this section also states:

> Disclosure of an estimate of *reserves*, *contingent resources or prospective resources* in respect of which timely availability of funding for development is not assured may be misleading if that disclosure is not accompanied, proximate to it, by a discussion (or a cross-reference to such a discussion in other disclosure filed by the *reporting issuer* on SEDAR) of funding uncertainties and their anticipated effect on the timing or completion of such development (or on any particular stage of multi-stage development such as often observed in oil sands developments).

Items 5.1(1)(b) and 5.1(2)(b) of Form 51-101F1 encourage accountability with respect to the assignment of reserves. This requires an RI to discuss the basis on which proved undeveloped reserves and probable undeveloped reserves, respectively, have been attributed, its plans, and if applicable, its reasons for deferring development beyond two years.

Similarly, accountability with respect to resources other than reserves is encouraged by section 5.9(2)(d)(iii.1). This section requires disclosure of the estimated total cost to achieve commercial production, and the general timeline of the project, including the estimated date of first commercial production.

6. 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 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 feedback on issues and current developments regarding the evaluation of oil and gas resources, and disclosure related to oil and gas activities.
- Comment on related current and proposed Alberta securities laws and regulatory policies.
- Provide advice to staff on an informal basis.

Topics discussed in the last year include potential evaluation and disclosure implications resulting from the adoption of the International Financial Reporting Standard's IFRS 16 *Leases*, the International Accounting Standards Board's consideration regarding introduction of a comprehensive standard on extractive activities, and current resource evaluation and disclosure considerations.

The ASC thanks the Members for their contributions.

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.
Enjay Holdings Alberta Ltd.

Keith McCandlish, P.Geol., P.Geo., FGC, FEC (Hon.)
DMT Geosciences Ltd.

Ian McDonald, P.Eng.
CNOOC International

Jeff Meunier, P.Eng.
RBC Capital Markets

Rob Morgan, P.Eng.
Cona Resources Ltd.

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

Michael Verney, P.Eng.
McDaniel & Associates Consultants Ltd.

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7. Contact information

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GLOSSARY OF TERMS

The following terms and their definitions are sourced from 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.

"**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.

"**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 auditor or a qualified reserves evaluator.

"**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.

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