

2015 REPORT

Oil and Gas Review

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1. Introduction

1.1 General

The annual Alberta Securities Commission's (ASC) oil and gas review report (Report) consists of observations and analysis of disclosure from issuers reporting under National Instrument 51-101 *Standards of Disclosure for Oil and Gas Activities* (NI 51-101) as well as regulatory topics of interest. NI 51-101 sets out both the general disclosure standards and specific annual disclosure requirements for reporting issuers (RIs) engaged in oil and gas activities. Information in this Report is drawn primarily from disclosure that occurred in 2014, supplemented with more recent information. It is intended to assist RIs with the preparation of effective and compliant disclosure for the benefit of all capital market participants.

The energy industry (including oil and gas) is a major contributor to both the Canadian and Albertan economies. In Alberta, it accounted for 26 per cent of the province's 2014 gross domestic product¹. In December 2014, RIs engaged in oil and gas activities represented approximately 10 per cent of the companies listed on the Toronto Stock Exchange (TSX) and TSX Venture Exchange (TSXV) and 16 per cent of their aggregate market capitalization. At this time, 57 per cent of the aggregate market capitalization² of Alberta-based companies on these exchanges was attributed to oil and gas issuers³. Of the 383 RIs regulated in Canada and actively engaged in oil and gas activities at the beginning of 2015, 267 were principally regulated by the ASC.

The *Securities Act* (Alberta) ensures that Alberta's capital market operates fairly and efficiently, and that investors are provided with 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. NI 51-101 is the cornerstone of oil and gas disclosure in Canada, with the ASC leading its development and ongoing maintenance. On December 4, 2014, the Canadian Securities Administrators (CSA) published amendments to NI 51-101, its related forms and the Companion Policy 51-101CP *Standards of Disclosure for Oil and Gas Activities* (51-101CP). These were effective on July 1, 2015.

Under section 2.1 of NI 51-101, the securities regulatory authority requires annual filing of:

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

Depending on specific circumstances, the following may need to be filed:

- 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 Highlights of the Alberta Economy 2015, Alberta Government

² The MiG Report, December 2014, TMX Group

³ Ibid.

1.2 Executive Summary of Observations and Analysis

To support the fair and efficient operation of Alberta's capital market, the ASC reviews RI's continuous disclosure, including general and required annual disclosure. Deficiencies in disclosure may include errors, omissions and potentially misleading information. Depending on circumstances, Staff may address identified deficiencies with the appropriate RI. Section 92(4.1) of the *Securities Act* (Alberta) prohibits misleading disclosure and states:

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.

Guidance concerning misrepresentations and misleading statements is discussed in section 2(a)(i)(A) of CSA Staff Notice 51-327 *Revised Guidance on Oil and Gas Disclosure* (CSA Staff Notice 51-327). RIs that are uncertain whether their disclosure is compliant with the *Securities Act* (Alberta) and NI 51-101, are encouraged to seek professional counsel.

Review of disclosure has led to identification of a number of deficiencies. The most common involve contingent resources and prospective resources, type wells and drilling locations. Disclosure of contingent resources and prospective resources have been increasingly common in recent years, and are most frequently found in Form 51-101F1, annual information forms, news releases and prospectuses. Disclosure of type wells and drilling locations have also been on the rise and are most often found in investor presentations, news releases and increasingly in prospectuses. Observations regarding these deficiencies are summarized below and discussed in greater detail later in this Report, along with other notable deficiencies.

Contingent resources and prospective resources – examples:

An absence of appropriate and meaningful disclosure regarding:

- the specific risks and uncertainties of recovery;
- the specific significant positive and negative factors relevant to estimates;
- identification and discussion of significant factors or uncertainties affecting components of reserves data disclosed under Form 51-101F1; and
- identification and discussion of significant economic factors or uncertainties that have affected or are reasonably expected to affect the anticipated development or production activities on properties with no reserves assigned, disclosed under item 6.2.1 of Form 51-101F1.

Type wells (type curves), drilling locations and associated information – examples:

- unsourced information; specifically, a lack of clarity regarding whether the information has been prepared or audited by a qualified reserves evaluator or auditor;
- disclosure not prepared in accordance with the Canadian Oil and Gas Evaluation Handbook (COGE Handbook); and
- analogous information not prepared in accordance with NI 51-101.

As previously noted, the CSA published amendments to NI 51-101, its related forms and the Companion Policy (Amendments) on December 4, 2014 and these became effective July 1, 2015. The Amendments promote improved disclosure of resources other than reserves and associated metrics, recognize new product types, provide increased flexibility for oil and gas RIs that operate and report in different jurisdictions, and align NI 51-101 with the recently updated COGE Handbook, which is the technical standard for NI 51-101.

The COGE Handbook, which is maintained by the Society of Petroleum Evaluation Engineers (Calgary Chapter) (SPEE), was updated twice in 2014. The detailed guidelines for estimation and classification of bitumen resources (Bitumen Guidelines) was published April 1, while the guidelines for estimation and classification of resources other than reserves (ROTR Guidelines) was published July 17. As required by sections 5.2(1)(a)(iii), 5.9(2)(b) and 5.10(1)(c) of NI 51-101, all disclosure must be prepared in accordance with the COGE Handbook. The COGE Handbook, as amended from time to time, is incorporated by reference into NI 51-101. Accordingly, RIs must comply with the COGE Handbook as amended.

1.3 Disclosure Commentary

The oil and gas industry is continuously adapting to new realities, be they technical, economic, environmental, social, political or otherwise; legislation and guidance must continue to adapt to stay relevant. Recent technical changes can primarily be attributed to the widespread application of technologies such as horizontal drilling, massive hydraulic fracturing stimulations and enhanced oil recovery, to both established and previously undeveloped reservoirs. Recent updates to the COGE Handbook and NI 51-101 were largely driven by these technical advances.

Prior to 2010, oil and gas development in Canada was largely pursued with vertical wells and low tonnage fracture stimulations. Since 2010, the number of horizontal wells drilled has surpassed that of vertical wells⁴. Horizontal wells, often combined with massive hydraulic stimulations, have facilitated incremental recoveries from established reservoirs as well as access to formerly technologically inaccessible reservoirs, such as low permeability shales, siltstones, sandstones and carbonates. A major result of this has been increased recoverable volumes from individual wells, properties and RIs.

The conversion of recoverable volumes to producing reserves requires capital; fundamental to a company's access to capital is the ability to quantify and communicate asset value. To achieve this, RIs have been increasingly reliant on disclosure of resources other than reserves, specifically contingent resources and prospective resources, type wells (type curves) and drilling location inventories. Staff have observed that not all of this disclosure is compliant with NI 51-101, including the requirement that it be prepared in accordance with the COGE Handbook. This Report elaborates on these findings and provides information intended to assist RIs in improving the compliance of their disclosure.

⁴ National Energy Board Market Snapshot, June 24, 2015

2. Observations and Analysis Regarding Deficiencies in Disclosure

2.1 Overview

As noted previously, the Bitumen Guidelines and the ROTR Guidelines were published in July 2014. The ROTR Guidelines have, to date, had a particularly meaningful impact on oil and gas disclosure, due primarily to the large number of RIs that disclose resources other than reserves. However, while evaluations were required to be compliant with the ROTR Guidelines, disclosure of results compliant with the ROTR Guidelines was not required until July 1, 2015 (when amendments to NI 51-101, its related forms and the 51-101CP came into effect). As a result, the impact of the ROTR Guidelines on disclosure was not broadly felt until recently. Future oil and gas review reports will provide detailed observations and analysis regarding compliance with both the ROTR Guidelines and the Amendments.

The most frequent deficiencies in disclosure are described below. Specifically, we note deficiencies in the disclosure of contingent resources and prospective resources; type wells (type curves), drilling locations and associated information; well tests; and reserves reconciliations. Some of these concerns are consistent with those expressed in previous Reports but are repeated here due to ongoing concerns.

2.2 Contingent Resources and Prospective Resources

Under NI 51-101, the disclosure of resources other than reserves is generally optional. Exceptions include:

- if the information is material with respect to section 1.4(2) of NI 51-101;

[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.

- information concerning properties with no attributed reserves that is required to be disclosed by Part 6 of Form 51-101F1 (see section 5.7(1) of the 51-101CP for additional information); and
- prospectus disclosure if the information is material to the RI as contemplated under NI 51-101, per the general securities disclosure obligation of “full, true and plain” disclosure of all material facts (refer to section 5.10(2) of the 51-101CP and item 5.5 of Form 41-101F1 *Information Required in a Prospectus*).

While much of the disclosure of resources other than reserves reviewed by Staff meets the requirements of NI 51-101, Staff have observed consistent deficiencies with respect to disclosure of associated risks and uncertainties. The required disclosure is often missing. In cases where it is present, it is often boilerplate in nature instead of tailored to the RI’s particular circumstances. Particular attention should be paid to the potential for materially misleading disclosure, which is prohibited by section 92(4.1) of the *Securities Act* (Alberta).

If anticipated results are disclosed with respect to contingent resources and prospective resources, section 5.9(1)(d) of NI 51-101 requires disclosure of the risks and level of uncertainty associated with their recovery. This disclosure must be in writing in the same document or in a supporting filing. Guidance regarding this is contained in section 5.7(2) of 51-101CP, which states that to satisfy the requirements of section 5.9(1)(d) of NI 51-101:

[A] reporting issuer should ensure that their disclosure includes the risks and uncertainties that are appropriate and meaningful for their activities. This may be expressed quantitatively as probabilities or qualitatively by appropriate description. If the reporting issuer chooses to express the risks and level of uncertainty qualitatively, the disclosure must be meaningful and not in the nature of a general disclaimer.

An example of typical filed disclosure observed by Staff is as follows:

Significant risks and uncertainties that may affect the Company's reserves and associated future net revenue include:

- material changes to existing taxation or royalty rates;
- changes to environmental laws and regulations;
- fluctuations in product pricing;
- changes to capital expenditures and operating costs;
- surface access issues;
- receipt of regulatory approvals;
- availability of services and processing facilities; and
- unforeseen production performance issues.

We are of the view that this general disclosure does not meet the requirements of section 5.9(1)(d).

If the disclosure referred to in section 5.9(1)(d) includes an estimate of a quantity of resources other than reserves in which the RI has an interest or intends to acquire an interest, or includes an estimated value attributable to an estimated quantity, section 5.9(2)(d)(iii) of NI 51-101 requires the disclosure to be accompanied with the specific significant positive and negative factors relevant to that particular estimate. Simply listing general, unspecific factors that normally apply to all RIs does not satisfy the requirement. Guidance regarding this is found in section 5.7(3)(c) of 51-101CP, which identifies potential significant positive and negative factors, including lack of infrastructure, a significant lease expiry or any legal, capital, political, technological or business factor.

In addition, item 5.2 of Form 51-101F1 requires identification and discussion of significant factors or uncertainties affecting components of the reserves data disclosed under Form 51-101F1. Item 5.2 notes unusually high expected development costs or operating costs as examples. With the Amendments, abandonment and reclamation costs was added as an additional example (see Instruction (1)).

Item 6.2.1 of Form 51-101F1 requires the specific identification and discussion of significant economic factors or uncertainties that have affected or are reasonably expected to affect the anticipated development or production activities on properties with no reserves assigned. Similar to item 5.2, this may include unusually high expected development costs or operating costs and the need for construction of major pipelines and facilities. With the Amendments, abandonment and reclamation costs was added as an additional example.

2.3 Type Wells (Type Curves), Drilling Locations and Associated Information

Disclosure of type wells (type curves), drilling locations and associated information, such as recoverable volumes and economics, is an exceedingly common practice. It generally occurs in news releases and investor presentations, but in recent years it has occurred with increasing frequency in prospectuses. Disclosure of this information has the potential to be materially misleading, which is prohibited by section 92(4.1) of the *Securities Act* (Alberta). Staff's observations regarding these types of disclosures are similar, as are the disclosure requirements. As such, these observations and their analysis are discussed collectively in this section.

Type wells represent a profile of production performance over time, ideally created by averaging historical and forecast production data obtained from selected wells; the profile generated is often referred to as a “type curve.” These profiles can be used to help estimate production rates and cash flows with respect to reserves and resources other than reserves. This information is relied upon by qualified reserves evaluators or auditors to predict production performance for wells with minimal production history and by RIs to make investment decisions regarding analogous drilling locations.

It has become common practice for RIs to disclose inventories of drilling locations; these inventories frequently represent decades of drilling at current rates. A recurrent issue with this disclosure is that the “drilling locations” often represent little more than approved drilling densities in a particular field or perhaps simply drilling prospects. In addition, this disclosure is often not accompanied by an adequate description of the associated risks and uncertainties. A more appropriate term for many of these “drilling locations” may be “potential drilling opportunities,” particularly if they have not been properly evaluated and assigned recoverable resources by a qualified reserves evaluator or auditor.

Type wells and drilling locations may be a form of analogous information, which is discussed in section 5.10 of NI 51-101. RIs are also directed to section 5.8 of the 51-101 CP and item 2(a) of CSA Staff Notice 51-327.

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

- **Information not sourced** – Disclosure of information that has not been appropriately sourced can result in lack of clarity regarding whether estimates have been prepared by the RI or their independent qualified reserves evaluator or auditor. Properly distinguishing the source of disclosure is critical. In situations where the disclosure has been prepared by the RI, it is also often not clear if it has been prepared 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.
- **Ambiguous compliance with the COGE Handbook** – It is often unclear if disclosure 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. Estimates of recoverable volumes and associated net present value of future net revenue often do not meet the requirements of section 5.3 of NI 51-101, which 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.

Estimates sometimes lack any classification and are simply a volume and value.

Refer to section 5.7(3)(b) of 51-101CP regarding use of incorrect and misleading terminology, such as “reserves in-place”, “contingent resources in-place”, “potential reserves” and “undiscovered reserves.”

- **Poor methodology** – Information regarding how the disclosure was prepared is often absent. Requirements regarding preparation of analogous information is found in section 5.10 of NI 51-101 and discussed in section 5.8 of 51-101CP. With respect to type wells, information prepared and disclosed by RIs sometimes includes only the best wells, excluding 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 comments in relation to analogous information that:

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

- **Unsupported statements** – Typical examples of this are statements such as “test results exceed our type well” and “drilling inventory of 6,000 locations” with little or no accompanying information. Beneficial information would include the categories of reserves or resources other than reserves associated with the

disclosure and its source. For the drilling location disclosure in particular, information that enables the reader to understand the risks and uncertainties may be helpful.

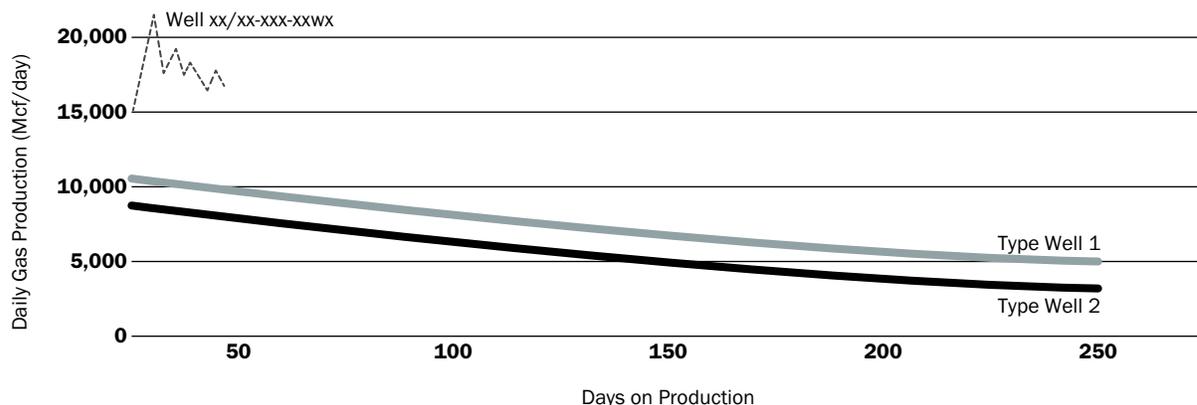
With respect to type wells and associated information, in order to avoid potentially misleading disclosure, consideration must be given to whether the results are actually significantly different from the certainty levels associated with the particular category of recoverable resource in the initial forecast. If the estimation and classification of recoverable resources are 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. If probabilistic methods are used, there should be at least a 90 percent probability (P90) 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 (P50) that the quantities actually recovered will equal or exceed the best estimate.

A balanced approach is important. 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 example of typically deficient type well disclosure observed by Staff is provided in Figure 1. The figure compares short term production results attributed to a single well to production profiles labelled “Type Well 1” and “Type Well 2.” In many cases, this type of disclosure is unaccompanied by any additional information.

Figure 1 Example of Deficient Type Well Disclosure



Staff’s concerns with the disclosure shown in Figure 1 include:

- only a few weeks of production data is presented – this may not be indicative of longer term performance;
- production results from only one well is shown; the disclosure may not be balanced;
- the source of the type wells is not provided;
- it is unclear if the type wells represent analogous information as discussed in section 5.10 of NI 51-101 and if they do, whether they meet its requirements;
- it is unclear if the type wells have been prepared 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;
- it is unclear if the type wells have 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; and
- no information is provided with respect to the categories of reserves or resources other than reserves associated with the type curves (refer to section 5.3 of NI 51-101).

A typical example of deficient drilling location disclosure observed by Staff is a statement like “current drilling inventory consists of approximately 4,000 low-risk locations.”

Staff's concerns with disclosure such as this include:

- the source of the drilling location inventory is not provided;
- it is unclear if the drilling inventory represents estimates prepared 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;
- it is unclear if the drilling inventory represents estimates 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;
- the categories of reserves or resources other than reserves attributed to the drilling locations have not been provided (refer to section 5.3 of NI 51-101); since risks and uncertainties of recovery vary by category of reserves and resources other than reserves, referring to them as low-risk may not be accurate; and
- the inventory may represent a summation of two or more categories of reserves and resources other than reserves, contrary to section 5.16(1) of NI 51-101.

2.4 Well Tests

The frequency of well test disclosure has diminished in recent years due to the industry's refocus on repeatable development, such as multi-well pad and infill drilling. When it is disclosed, well test data is typically found in news releases and investor presentations. Deficiencies noted by Staff include:

- an absence of information concerning the stratigraphic interval being tested;
- missing test durations;
- an absence of flowing pressures;
- missing information about stimulations, including the type of load fluid used and the amount and status of its recovery;
- missing information regarding whether the rates and pressures are peak, average, end or stabilized; and
- it not being clear that information disclosed isn't necessarily indicative of long-term performance or ultimate recovery

Section 3(a) of CSA Staff Notice 51-327 provides guidance concerning disclosure of well test data. This information is presented below.

Disclosure of well-flow test results can have a significant effect on the market price or value of an Oil and Gas Issuer. Additional information is often necessary in order to avoid misleading readers with such disclosure. Disclosing the results of short-term tests, "rates up to", or short-term peak rates as daily rates, for example, would be misleading without additional explanation.

Oil and Gas Issuers should include information about all of the following when disclosing well-flow test results:

- the geological formation(s) for which test results are being disclosed;
- the type of test (examples include wireline, drillstem testing (DST), or production test);
- duration of the test;
- average rate of oil- or gas-flow during the test;
- recovered fluid types and volumes (reporting the recovery of load fluid without stating that it is load fluid would be regarded as misleading);
- significant production or pressure decline during the test;
- if a pressure transient analysis or well-test interpretation has not been carried out, a cautionary statement should be made to the effect that the data should be considered to be preliminary until such analysis or interpretation has been done; and
- a cautionary statement that the test results are not necessarily indicative of long-term performance or of ultimate recovery.

In addition to the disclosure of the above information on a well-flow test, further disclosure may be necessary to avoid being misleading to readers, especially when high initial decline rates or a short production life are anticipated. Such additional disclosure could include expected duration of production.

Canadian securities legislation requires an Oil and Gas Issuer to make timely disclosure – notably when the result of a test and its implications could amount to a material change.

At a time when RIs are increasingly focused on repeatable development activities, it is important to consider the relevance of disclosing test results for individual wells, particularly when weighed against the prohibition on misleading statements discussed in section 92(4.1) of the *Securities Act* (Alberta). To ensure accurate and factual disclosure, it must be ascertained whether results are significantly different than initially forecast. The fact that well test results often don't accurately reflect an interval's initial production rate, long-term performance or ultimate recovery, must also be considered. As mentioned in section 2.3 of this Report, if the estimation and classification of recoverable resources has been done appropriately, long-term results should not vary from the certainty levels attributed to the estimates.

A balanced approach to disclosure is important. 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).

Please refer to section 5.10 of NI 51-101 regarding disclosure of analogous information and section 5.8 of 51-101CP for guidance.

2.5 Reserves Reconciliations – General

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 reconciliation is required by country, product type specified in 4.1(2)(b) (defined in section 1.1(4) of NI 51-101) and reserve change category specified in item 4.1(2)(c), with an explanation provided for each category (prior to the Amendments, a mix of product types and the now-repealed production groups were specified). 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 result of this comparison is the “closing balance” of the reconciliation.

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

- extensions and improved recovery;
- technical revisions;
- discoveries;
- acquisitions;
- dispositions;
- economic factors; and
- production.

Instruction (4) requires reserves attributed to infill drilling to be either included in extensions or improved recovery or in a separate reserve change category labelled “infill drilling.”

During reviews, Staff observed a number of deficiencies with respect to reserves reconciliations. Some of the more frequent deficiencies, alongside their associated reserve change category, are noted below. Examples of some of these deficiencies are illustrated in Figure 2.

- **Opening balance** – Misalignment between the opening balance for the current year and the previous year's closing balance. These values should match.
- **Extensions and improved recovery** – The recording of negative volumes. Once volumes have been assigned to this reserve change category, 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 recording of negative technical revisions greater than 100 per cent of the opening balance. It is not possible to remove volumes of reserves in excess of the opening balance solely through a technical revision.
- **Acquisitions** – Incorrect dates regarding the timing of reserves additions through acquisitions. Paragraph 7.3.3(g) of volume 2 of the COGE Handbook states that additions are recorded at the closing date of the acquisition. However, as stated in section 2.7(6)(c) of 51-101CP, the correct date to reconcile changes in the acquired reserves is the effective date. This section states:

[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 issuer may wish to explain this as part of the reconciliation in a footnote to the reconciliation table.

- **Production** – Production volumes not aligning with volumes reported under item 6.9 of Form 51-101F1. These values should match.
- **Closing balance** – Closing balance volumes not aligning with the volumes disclosed under item 2.1(1) of Form 51-101F1. These values should match.
- **Re-categorization of reserves** – The absence of a discussion that identifies the occurrence or explains the basis for re-categorization of reserves. For example, probable reserves re-categorized as proved reserves, which can go unnoticed as a result of the proved plus probable reserves (in total) remaining the same.

General deficiencies include arithmetical errors and missing or inconsistent units of measure. Refer to General Instruction (7) of Form 51-101F1 for further information regarding units of measure.

Figure 2 illustrates several of the deficiencies described above (see circled items). These include: a large negative technical revision without an explanation for the proved reserves estimate for light and medium crude oil; an arithmetic error in the closing balance for the proved plus probable reserves estimate for NGL; and inconsistent units for shale gas for each of the proved and proved plus probable reserves estimates.

Figure 2 Example Deficient Reserves Reconciliation

Factors	Light and Medium Crude Oil Gross Proved (Mbbbl)	Light and Medium Crude Oil Gross Proved plus Probable (Mbbbl)	NGL Gross Proved (Mbbbl)	NGL Gross Proved plus Probable (Mbbbl)	Shale Gas Gross Proved (MMcf)	Shale Gas Gross Proved plus Probable (Bcf)
As at December 31, 2013	440,000	559,000	43,000	61,000	1,078	1,474
Extensions and Improved						
Recovery	(78,000)	13,500	6,000	9,200	77	112
Technical Revisions	(148,000)	9,650	3,000	4,200	12	17
Discoveries		6,300		0	0	0
Acquisitions	9,000	18,200	1,500	1,900	0	0
Dispositions		0	1,450	2,200	0	0
Economic Factors	2,500	3,800	(1,000)	(1,400)	27	33
Production	(33,000)	(48,000)	(2,300)	(3,900)	(109)	(156)
As at December 31, 2014	192,500	562,450	51,650	25,100	1,085	1,480

There are a number of changes to product types resulting from the Amendments. Several product types have been added, many have new definitions and some product types have been repealed. Details of these changes are provided in section 3.5 of this Report. Product types prior to the Amendments are shown on the left side of Figure 3, while current product types per section 1.1 of NI 51-101 are presented on the right.

Figure 3 Comparisons of Product Types

OLD	NEW
<p>conventional activities</p> <p>light & medium crude oil (combined)</p> <p>heavy oil</p> <p>natural gas excluding natural gas liquids</p> <p>natural gas liquids</p> <p>non-conventional activities</p> <p>synthetic oil</p> <p>bitumen</p> <p>coal bed methane</p> <p>hydrates</p> <p>shale oil</p> <p>shale gas</p>	<p>bitumen</p> <p>coal bed methane</p> <p>conventional natural gas</p> <p>gas hydrates</p> <p>heavy crude oil</p> <p>light crude oil & medium crude oil combined</p> <p>natural gas liquids</p> <p>shale gas</p> <p>synthetic crude oil</p> <p>synthetic gas</p> <p>tight oil</p>

RIs cannot reconcile estimates associated with product types introduced with the Amendments with those in prior existence. For example, estimates associated with new product types tight oil and conventional natural gas cannot be reconciled, as there is no opening balance for these to reconcile with. Similarly, in instances where a product type has been repealed (or with respect to repealed production groups), a reconciliation cannot be undertaken.

Section 2.7(6)(a) of 51-101CP provides guidance for situations where a RI reports reserves for its current reporting period, but had none to report at the start of the period. If the added reserves were material (see section 1.4 of NI 51-101), a reconciliation must be carried out. In these situations, the opening balance is zero.

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 and in circumstances where no reserves evaluation at the last day of their preceding financial is available. In these circumstances, RIs are not required to provide a reconciliation, but must instead provide the reason for its absence.

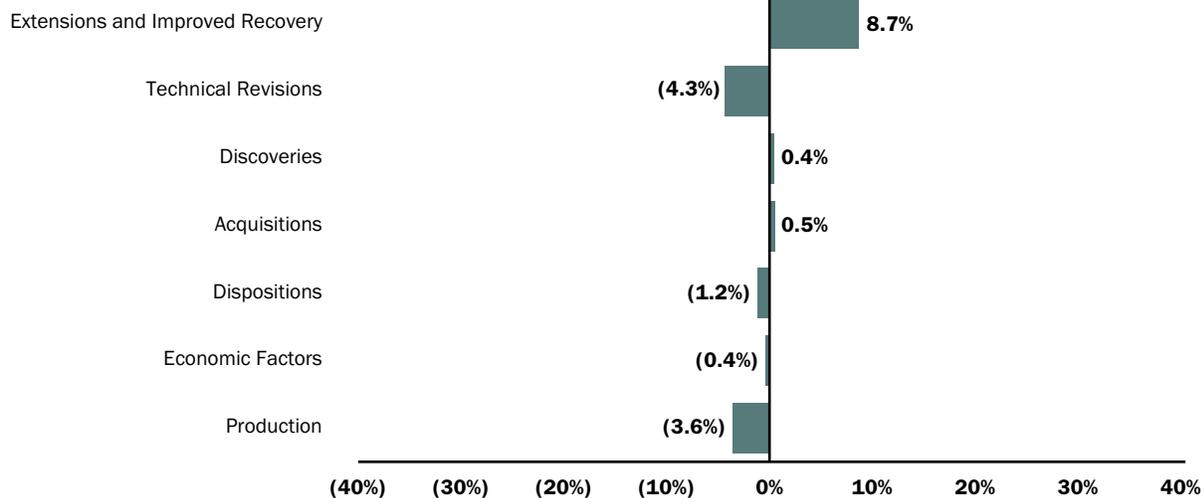
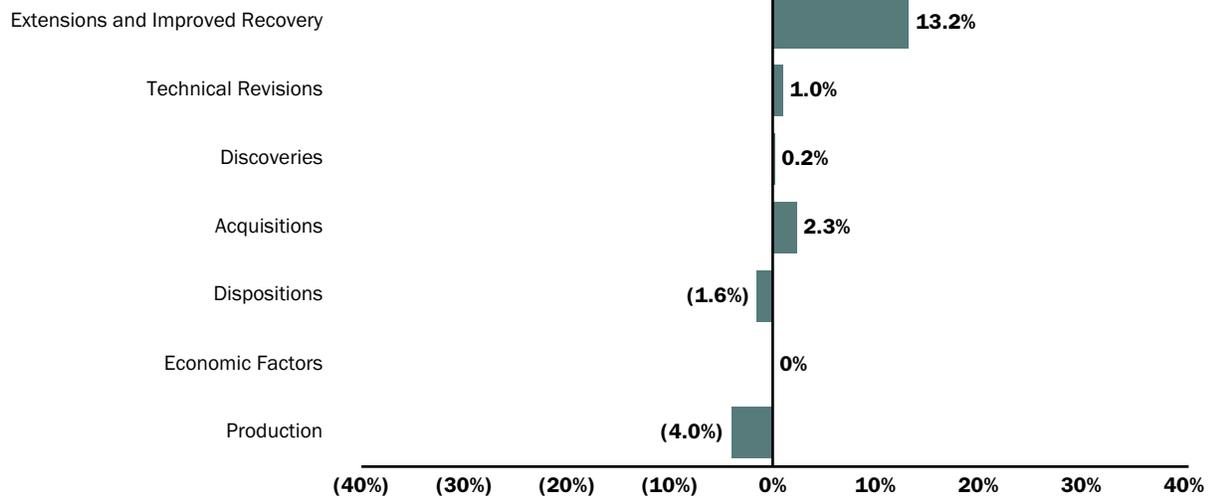
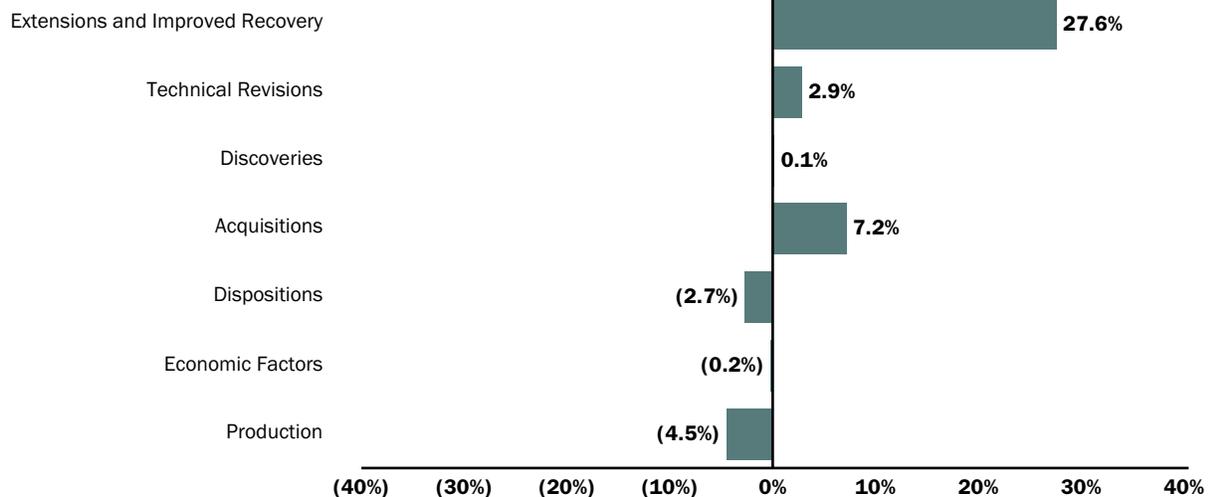
Sections 2.7(6) and 5.10(4) of 51-101CP provide additional information regarding reserve reconciliation with respect to initial public offerings. The COGE Handbook provides descriptions of reserve change categories and guidance on preparation of the reconciliation.

2.5.1 Reserves Reconciliations – Observations and Analysis

Figure 4 presents reconciliations of gross⁵ proved plus probable reserves (in total) disclosed during 2014 for groups of RIs principally regulated by the ASC. Based on average daily gross sales volumes disclosed quarterly by country and product type under item 6.9 of Form 51-101F1, RIs were ranked and then grouped as follows: seniors >100,000 barrels of oil equivalent per day; intermediates 10,000 to 100,000 barrels of oil equivalent per day; and juniors <10,000 barrels of oil equivalent per day. Based on their respective ranking, the RIs were then selected for inclusion in the reconciliations. There were nine senior RIs that exceeded 100,000 barrels of oil equivalent per day, and due to the small number, all were selected, while the top 20 intermediates and top 50 juniors were selected.

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. The percentage change between the opening balance of 2014 (the closing balance of 2013) and the closing balance of 2014 was calculated and the results were plotted in figures 1a, 1b and 1c. Positive and negative changes plot to the right and left of the opening balance (denoted as 0 per cent), respectively. While generalized, the purpose of this exercise is to assess the quality of reserves estimates disclosed by RIs of similar size.

⁵ Defined in CSA Staff Notice 51-324 Revised Glossary to NI 51-101 Standards of Disclosure for Oil and Gas Activities

Figure 4 2014 Gross Proved Plus Probable Reserves Reconciliations by Group*Figure 4a Seniors**Figure 4b Intermediates**Figure 4c Juniors*

Based on an analysis of the data, the seniors' group exhibits the least amount of change in gross proved plus probable reserves (in total), with essentially no change calculated, while the intermediates and juniors increased 10 per cent and 23 per cent, respectively. With respect to estimates of proved reserves, increases of 2 per cent, 10 per cent and 17 per cent, respectively, has occurred for the seniors, intermediates and juniors.

Technical revisions are negative 4 per cent for the seniors. This is attributed mainly to a single RI's proved and proved plus probable reserves. For the intermediates, technical revisions are positive 1 per cent. This was strongly influenced by changes to one RI's estimates of proved plus probable reserves. For the juniors, a positive 3 per cent change has occurred. Most of the junior RI's in the group experienced positive technical revisions. In comparison, last year's Report (that compared data from 2013) showed a slightly negative technical revision for the seniors, a positive 1 per cent change for the intermediates and a negative 5 per cent change for the juniors.

Changes in extensions and improved recovery are strong for all three groups, although the largest change is exhibited by the juniors, consistent with the previous Report. For the seniors, the majority of the change is attributed to estimates of proved plus probable bitumen reserves, while for the intermediates, most is attributed to estimates of proved plus probable associated gas and non-associated gas (combined) reserves. For the juniors, most of the change is ascribed to two RI's estimates of proved plus probable reserves.

Consistent with the industry's shift away from exploratory activities in recent years, changes in discoveries are small and positive for all groups. Changes in both acquisitions and dispositions are relatively small for all three, with the largest changes attributed to the juniors, and the smallest to the seniors. All three groups have slight negative adjustments in economic factors.

2.5.2 Reserves Reconciliations – Quality of Reserves Estimates

In addition to providing information concerning the nature of an RI's activities, reserves reconciliations can provide insight into the quality of estimates. In particular, the technical revisions reserve change category can provide insight over time into whether or not estimates have been meeting the certainty levels for proved and proved plus probable reserves (described in section 5.4.3 of volume 1 of the COGE Handbook). Positive and negative technical revisions are generally attributed to better or poorer reservoir performance, respectively, than initially forecast. If reserves have been determined in accordance with the certainty levels described in section 5.4.3 for a given entity, proved reserves should be adjusted positively over time, while proved plus probable reserves should remain relatively constant.

Since a reserves reconciliation analysis was undertaken for the first time in last year's Report, a long-term analysis regarding the quality of reserves data cannot be undertaken. However, some preliminary conclusions can be drawn. An analysis of the reconciliations for 2014 suggests that the estimates are high-quality overall. Proved plus probable reserves estimates for the intermediates and juniors have a positive technical revision, while the seniors have a negative technical revision due to negative revision attributed to a single RI. However, if this RI is excluded from the analysis, the group has a positive technical revision.

A similar analysis undertaken and presented in last year's Report indicated that the estimates for all groups also appeared to be of high quality. However, the quality for individual RIs within each group varied. In addition, a minor negative technical revision occurred for a single senior RI. Analysis of data from future years will help ascertain if there is an issue with the quality of reserves data for any of the groups.

3. Topics of Interest

3.1 Overview

This section contains information concerning current topics of interest regarding disclosure. The subject matter is primarily related to the Amendments and is drawn from Staff observations and interactions with capital market participants, including RIs, independent qualified reserves evaluators or auditors and legal professionals. The topics include:

- abandonment and reclamation costs;
- contingent resources and prospective resources;
- oil and gas activities; and
- product types.

The information provided is not exhaustive; there is more available in the legislation and guidance and which should also be considered. Please consult appropriate professional counsel.

3.2 Abandonment and Reclamation Costs

In an effort to improve disclosure, changes were with the Amendments to information regarding abandonment and reclamation costs. Included in these changes, definitions for both “abandonment and reclamation costs” and “future net revenue” were added to section 1.1 of NI 51-101. Prior to this, abandonment and reclamation costs was undefined in both legislation and guidance, although the term was used in NI 51-101.

The definitions for abandonment and reclamation costs and future net revenue from section 1.1 of NI 51-101 are as follows:

Abandonment and reclamation costs – All costs associated with the process of restoring a reporting issuer’s property that has been disturbed by oil and gas activities to a standard imposed by applicable government or regulatory authorities.

Future net revenue – 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. *(Emphasis added)*

Item 2.1(2) of Form 51-101F1 requires disclosure of the net present value of future net revenue. This disclosure is to occur by country and in aggregate for the future net revenue attributable to the reserves categories referred to in item 2.1(1), which are:

- a) proved developed producing reserves;
- b) proved developed non-producing reserves;
- c) proved undeveloped reserves;
- d) proved reserves (in total);
- e) probable reserves (in total);
- f) proved plus probable reserves (in total); and
- g) if the reporting issuer discloses an estimate of possible reserves in this statement:
 - (i) possible reserves (in total); and
 - (ii) proved plus probable plus possible reserves (in total).

The definition of future net revenue provided above specifies that it is net of associated abandonment and reclamation costs. Historically, some RIs have disclosed future net revenue for certain categories of reserves (and resources other than reserves) that has not been net of abandonment and reclamation costs. Furthermore, some RIs have excluded the reclamation component of these costs altogether. RIs must ensure that disclosed net present value of future net revenue is net of abandonment and reclamation costs. RIs must also ensure that their disclosure is not materially misleading, per section 92(4.1) of the *Securities Act* (Alberta).

Additional information concerning disclosure of abandonment and reclamation costs includes:

- Item 2.1(3)(b) of Form 51-101F1 requires disclosure of abandonment and reclamation costs by country and in aggregate for the reserves categories specified in 2.1(3)(a), which are:

- (i) proved reserves (in total);
- (ii) proved plus probable reserves (in total); and
- (iii) if paragraph 1(g) of 2.1(1)(g) applies, proved plus probable plus possible reserves (in total).

- Significant abandonment and reclamation costs attributed to properties with reserves data are required pursuant to the Amendments to be disclosed under item 5.2 of Form 51-101F1; reserves data is defined as proved reserves and probable reserves and related future net revenue in CSA Staff Notice 51-324. Significant abandonment and reclamation costs may be attributed to such things as pipelines and facilities.
- Significant abandonment and reclamation costs attributed to properties with no reserves assigned are required pursuant to the Amendments to be disclosed under item 6.2.1 of Form 51-101F1. Significant abandonment and reclamation costs may be attributed to such things as pipelines and facilities.
- By definition, future net revenue is revenue from which abandonment and reclamation costs has been deducted. The definition refers to resources; therefore, all disclosure of future net revenue must be net of abandonment and reclamation costs, whether disclosure is attributed to reserves or resources other than reserves.

CSA Staff Notice 51-345 *Disclosure of Abandonment and Reclamation Costs in National Instrument 51-101 and Related Forms*, was published on November 5, 2015. The notice is a reminder to RIs and their independent qualified reserves evaluators or auditors of the requirements concerning abandonment and reclamation costs in NI 51-101 and related forms, and their respective responsibilities. The information presented in this section is drawn from this notice.

3.3 Contingent Resources and Prospective Resources

Section 2.2 of this Report discusses the generally optional disclosure of resources other than reserves, with the following exceptions noted:

- if the information is material pursuant to section 1.4(2) of NI 51-101;
- information concerning properties with no attributed reserves required to be disclosed by part 6 of Form 51-101F1; and
- prospectus disclosure if the information is material to the RI, as contemplated by NI 51-101 (see item 5.5 of Form 41-101F1 *Information Required in a Prospectus*).

Part 7 of Form 51-101F1 was introduced with the Amendments and contains a number of requirements for RIs that choose to disclose contingent resources and prospective resources in Form 51-101F1. These requirements include:

- estimates disclosed as an appendix to Form 51-101F1;
- estimates risked for chance of commerciality:
 - for prospective resources, risk for chance of discovery and chance of development
 - for contingent resources, risk for chance of development

- for contingent resources, include the risked 2C (best estimate) volumes, gross and net, for each product type, classified in each applicable project maturity sub-class (see Figure 5);
- include the risked net present value of the future net revenue of the 2C estimates, if contingent resources in the development pending sub-class are disclosed;
- include the risked best estimate volumes, gross and net, for each product type, if prospective resources are disclosed; and
- if net present value of future net revenue is disclosed, include the following cautionary statement in bold font proximate to the disclosure.

An estimate of risked net present value of future net revenue of [contingent resources] [and] [prospective resources] is preliminary in nature and is provided to assist the reader in reaching an opinion on the merit and likelihood of the company proceeding with the required investment. It includes [contingent resources] [and] [prospective resources] that are considered too uncertain with respect to the [chance of development] [and] [chance of discovery] to be classified as reserves. There is uncertainty that the risked net present value of future net revenue will be realized.

Figure 5 Project Maturity Sub-Classes of Contingent Resources

TOTAL PETROLEUM INITIALLY-IN-PLACE (PIIP)	DISCOVERED PIIP	COMMERCIAL	PRODUCTION	PROJECT MATURITY Sub-Classes			
			RESERVES	On Production	Approved for Development	Justified for Development	
		SUB-COMMERCIAL	CONTINGENT RESOURCES	Development Pending	Development on Hold	Development Unclassified	Development not Viable
				UNRECOVERABLE			
	UNDISCOVERED PIIP			PROSPECTIVE RESOURCES			
		UNRECOVERABLE					

↑ Increasing chance of commerciality

Modified from the ROTR Guidelines

For additional information concerning contingent resources and prospective resources, please note the following:

- section 2.1(2)(b)(ii) of NI 51-101 (new with the Amendments) requires contingent resources and prospective resources disclosed in Form 51-101F1 to be evaluated or audited by one or more independent qualified reserves evaluators or auditors;
- 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 unclassified 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.

- for all disclosure of anticipated results from resources other than reserves (which includes contingent resources and prospective resources), disclosure of the risks and level of uncertainty associated with the estimates is required in writing in the same document or in a supporting filing by section 5.9(1)(d) (see section 5.7(2) of 51-101CP); and
- if the disclosure referred to in section 5.9(1)(d) of NI 51-101 includes an estimate of a quantity of resources other than reserves in which the RI has an interest or intends to acquire an interest, or includes an estimated value attributable to an estimated quantity, the disclosure is required by section 5.9(2)(d)(iii.1) (new with the Amendments) of NI 51-101 to be accompanied with a description of the applicable project(s) that includes the following:

- (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;
- (C) the recovery technology;
- (D) whether the project is based on a conceptual or pre-development study.

3.4 Oil and Gas Activities

NI 51-101 applies to RIs engaged in oil and gas activities, which is defined in section 1.1 of NI 51-101 as follows:

“[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.

51-101CP provides guidance on what may constitute oil and gas activities and states in part:

The definition of oil and gas activities is broad. For example, a reporting issuer with no reserves, but with prospects, unproved properties or resources, other than reserves, may be deemed to be engaged in oil and gas activities because such activities include exploration and development of unproved properties. NI 51-101 will also apply to an issuer that is not yet a reporting issuer if it files a prospectus or other disclosure document that incorporates prospectus requirements.

Section 6.2 of NI 51-101 was introduced with the Amendments and requires a RI to file a notice with the securities regulatory authority prepared in accordance with Form 51-101F5 *Ceasing to Engage in Oil and Gas Activities* (Form 51-101F5), not later than 10 days after ceasing to be engaged, directly or indirectly, in oil and gas activities.

3.5 Product Types

RIs engaged in oil and gas activities are primarily involved in the search, recovery and sale of hydrocarbon substances termed “product types”, which are defined in section 1.1 of NI 51-101. These RIs have continuous disclosure requirements under NI 51-101, which include the disclosure of information regarding their activities, such as volumes and net present value of future net revenue of reserves data. Disclosure of this information by product type is a central element of these requirements.

There were many changes to product types with the Amendments, including:

- all product types are now defined in section 1.1 of NI 51-101;
- most product type definitions have been sourced from the COGE Handbook and modified for regulatory purposes;
- hydrocarbon sources and recovery processes are now emphasized;
- the differentiation of product types into conventional activities and non-conventional activities has been removed; and
- product type has replaced the concept of production group.

Specific product type changes include:

- new product types:
 - ♦ conventional natural gas
 - ♦ synthetic gas
 - ♦ tight oil
- new definitions:
 - ♦ bitumen
 - ♦ heavy crude oil (previously heavy oil)
 - ♦ natural gas liquids
 - ♦ synthetic crude oil (previously synthetic oil)
- definitions added for (previously undefined in NI 51-101):
 - ♦ coal bed methane
 - ♦ gas hydrates (previously hydrates)
 - ♦ light crude oil & medium crude oil combined (previously light and medium crude oil (combined))
 - ♦ shale gas
- other notable changes:
 - ♦ natural gas excluding natural gas liquids has been repealed
 - ♦ shale oil has been repealed

All current product types are listed in Figure 3 on page 11 of this Report.

If it is difficult to match an RI’s particular circumstances to the product types in NI 51-101, please refer to section 1.1(4) of 51-101CP. Select information from this section is summarized below.

- RIs engaged in oil and gas activities may need to supplement the disclosure prescribed in NI 51-101 and Form 51-101F1 with information specific to those activities.
- RIs should choose the closest product type if the substance produced does not exactly match one of the product types or if it matches more than one.
- An RI must ensure that its disclosure is not misleading and will have to consider whether additional explanation is required to provide the necessary context.

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 (PAC Members) drawn from the oil and gas and related industries who are appointed to three-year terms. PAC meetings are normally held four times per year and attended by PAC Members, outside observers and select ASC staff and executives. The mandate of PAC is to:

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

Topics discussed during the last year include:

- amendments to NI 51-101, related forms and 51-101CP, made effective July 1, 2015;
- feedback and compliance with the Amendments following the effective date;
- feedback and compliance with the Bitumen Guidelines and ROTR Guidelines following their 2014 publication;
- future updates to the COGE Handbook;
- abandonment and reclamation costs and product types in NI 51-101, related forms and 51-101CP; and
- current disclosure concerns.

The ASC thanks the PAC Members for their contribution.

Current PAC Members:

David P. Carey, P.Eng., MBA

ARC Resources Ltd.

Jonathan Fleming, B.Comm., MBA

Granite Oil Corp.

Chris Fong, P.Eng.

Retired

Harry Helwerda, P.Eng., FEC

Sproule Associates Limited

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.

Crew Energy Inc.

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