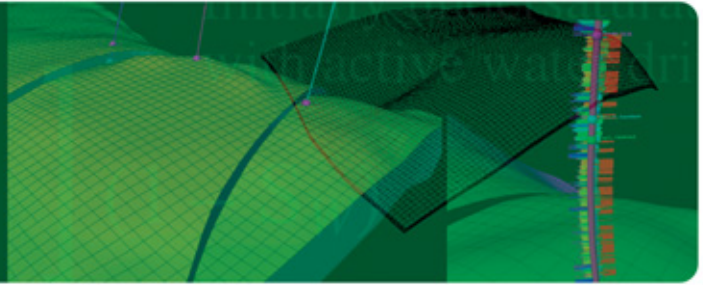


RESERVOIR SOLUTIONS



A quarterly publication of Ryder Scott Petroleum Consultants

June–August 2003/Vol. 6, No. 2

Canadian reserves regulations may create disparities between U.S., Canadian valuations

Major Canadian E&P companies say that exemptions will level playing field for capital



Canadian E&P companies, at least the smaller ones, are preparing for petroleum reserves reporting regulations that some say will value those “junior issuers” more liberally than issuers in U.S. markets, as all compete for a common capital pool. At the core of the debate are reserves engineering techniques outlined in an industry-produced handbook sanctioned by Canadian regulators.

The bigger Canadian public companies, senior issuers (or those producing 100,000 BOEPD or more), are expected to be exempt from following those Canadian rules. Those large “cross-border issuers” listed on Canadian and U.S. stock exchanges will have the option to report reserves under U.S. Securities and Exchange Commission/Financial Accounting Standards Board standards.

They lobbied for and won exemptions from proposed regulations, arguing that Canadian companies would be undervalued and handicapped in competition with U.S. issuers for investment dollars — an irony considering that Canadian regulators will likely allow statistical aggregation of reserves, which may boost



The barrel-of-oil equivalents of gas from this McKenzie Delta field in Canada may be overstated compared to oil reserves in the country because of a mandated 6-to-1 conversion ratio. However, the “portfolio effect” of aggregating reserves is stirring most debate on regulations.

reserves estimates for larger producers.

The proposals, drafted by the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) with assistance from the Calgary chapter of the Society of Petroleum Evaluation Engineers (SPEE), are embodied in National Instrument (NI) 51-101. It is slated for approval by the provincial securities commissions in July, scheduled to become law Sept. 30 and expected to apply annually beginning Dec. 31, 2003.

The Canadian regulations allow the reporting of reserves in two ways.

■ Proved reserves using year-end constant pricing and cost assumptions — Although similar to the SEC/FASB proved reserves definition, NI 51-101 differs. For instance, it does not require proof of ability to finance planned development of proved volumes, but rather defers this to financial disclosures. Some large Canadian issuers and their evaluators say that they want no material differences in proved reserves volumes under U.S. or Canadian guidelines.

■ Proved and probable reserves using forecast prices and costs

R.G. Moffat, CEO at Canadian company Bow Valley Energy Ltd., said in a comment letter to the

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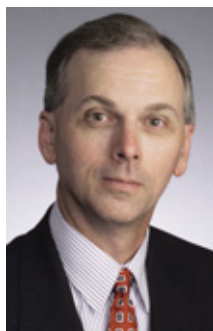
People



Gibbon



Connor



McBride



Krieger



Stell



Savoie

Engineer joins RS, five promoted

Ed Gibbon recently joined Ryder Scott as a petroleum engineer. Besides working for the firm as a contract engineer, he most recently was vice president of reservoir engineering at Harken

Energy Corp. from 2000 to 2002. Gibbon held the same position at Tatham Offshore Inc. from 1993 to 1998. He was president of IDM Engineering Inc. from 1983 to 1993.

Gibbon specializes in integrated reservoir studies; evaluation of reserves, field performance and economics; well-test analysis; enhanced oil recovery projects; acquisition appraisals; prospect analyses; development planning; litigation support and expert witness testimony.

He graduated from the Colo-

rado School of Mines in 1968 with a BS degree in petroleum engineering. He is a registered professional engineer in Texas and Louisiana and a member of the Society of Petroleum Engineers and Society of Petroleum Evaluation Engineers.

Petroleum engineers **Larry Connor**, **Doug McBride**, **Gary Krieger** and **Mike Stell** were promoted from vice presidents to senior vice presidents.

Dick Savoie, petroleum engineer, was promoted to vice president.

Publisher's Statement

Reservoir Solutions newsletter is published quarterly by Ryder Scott Company LP Petroleum Consultants. Established in 1937, the reservoir evaluation consulting firm performs more than 1,000 studies a year. Ryder Scott has issued reports on more than 200,000 wells or producing entities in North America.

The firm has also evaluated hundreds of international oil and gas properties involving thousands of wells. Ryder Scott multidisciplinary studies incorporate geophysics, petrophysics, geology, petroleum engineering, reservoir simulation and economics. With 117 employees, including 66 engineers and geoscientists, Ryder Scott has the capability to complete the largest, most complex reservoir-evaluation projects in a timely manner.

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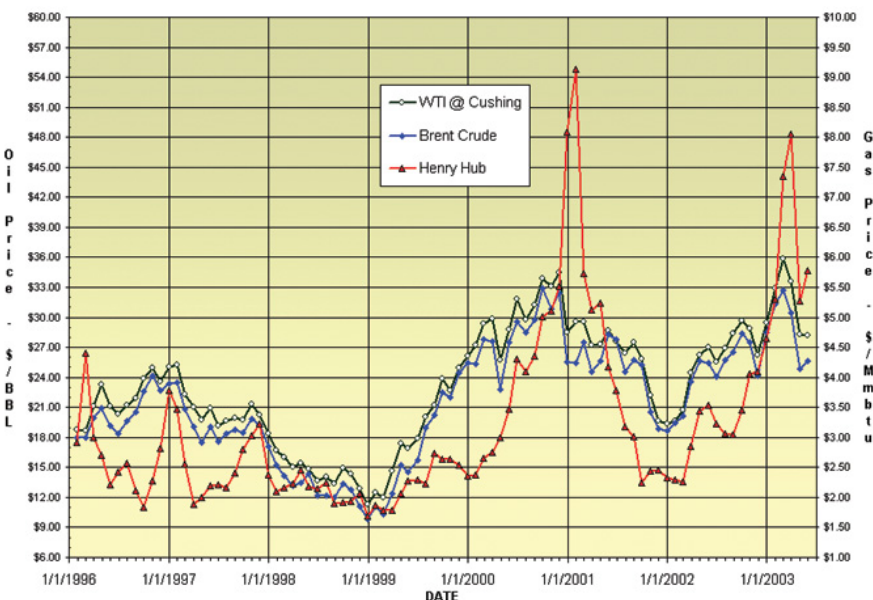
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Price history of benchmark oil and Henry Hub gas



The historical price chart shows published, monthly-average, cash market prices for WTI crude at Cushing (NYMEX), Brent crude and Henry Hub gas.



Veteran petroleum engineering consultant **Chapman Cronquist** donated his professional library to Ryder Scott. He collected the books and papers, some rare, over more than 40 years. They weigh 1,500 pounds and take up 40 feet of shelf space. "Ryder Scott and Chap have been friends for many years. We appreciate his generosity," said Ron Harrell, CEO.



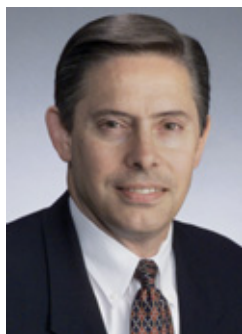
Ryder Scott employees and contractors stand in front of a house in April after making repairs and donating \$1,600 for materials, marking the second year of participation in the Houston Sheltering Arms program. The house, owned by widow Gladys Smith, was damaged by the Allison storm.



Comments of **Dan Olds**, petroleum engineer, were published in an April 17 Dow Jones news service article

on FAS 143, a new accounting standard for plugging and abandonment costs. The article stated that the first quarter of 2003 could produce much higher charges for some companies as they adjust past accounting. Olds said, "The process to calculate this liability is very complex. The thing that's really scary about it is that next year, you do it all over again."

The Minerals Management Service recently proposed a royalty relief program for deep gas wells drilled on the Gulf of Mexico shelf. Relief of up to 25 Bcf may be earned for wells drilled below 15,000 ft or 18,000 ft on new or existing leases. Under certain circumstances, credits can be earned for dry holes. "This program is somewhat unique in that although it is currently in the public comment stage and not expected to be ratified until fall 2003, it is expected to be retroactive to wells spudded on or after March 26, 2003," said Olds. Ryder Scott anticipates that several clients will be eligible to earn credits. For more information, contact Olds at dan_olds@ryderscott.com.



Roesle

President **Don Roesle** is program chairman for the Oil and Gas Property Portfolios, June 25-26, at the Fairmont Palliser Hotel in Calgary. He will present "International Best Practices in Estimating Fair Market Value" on Thursday, June 26, at 10 a.m. "Fair market value is a building block in the effective management of a property portfolio," he said.

New Web site offerings

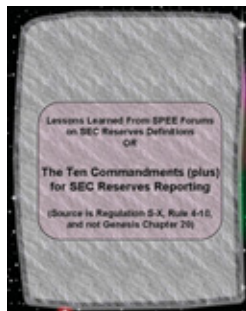


Ryder Scott planned to upgrade all downloadable Reservoir Solutions freeware programs for posting in June at www.ryderscott.com. "The changes have been made to facilitate ease of use and to make the user interfaces more intuitive," said developer **James Latham**, vice president.

The Gas Material Balance will feature automatic calculation of original gas in place. The ResGAS program will segregate extraction fractions for CO₂ and N₂ and feature new calculation tests to ensure that entered gas mole percents total 100 percent. Latham has also converted heating-value calculations for separator and residue gas to a gross basis rather than a net one. Also, users will be able to enter separate recovery factors for condensate.

All programs will have protected worksheets with enhanced navigation. Users will simply tab or press enter to move from one input cell to the next.

The new corporate brochure in PDF format is posted for downloading in the What's New section of the site. A listing of available services is on the back page. To receive a hard copy, contact **Mike Wysatta**, business development manager, at mike_wysatta@ryderscott.com.



Ron Harrell, CEO, presented the "Ten Commandments for Reserves Reporting to the SEC" at a ChevronTexaco reserves forum last May. The presentation is posted in the What's New section of the Web site.

NI 51-101—Cont. from Page 1

securities commissions, "The use of two definitions of proved reserves will very likely result in much confusion arising particularly in the eyes of investors."

Independent audit a must

Some juniors and seniors alike have said that the real reason for the battle with lawmakers to get exemptions is that seniors did not want to be required to use independent consultants to annually evaluate or audit reserves. Seniors are expected to be exempt; juniors are not.

"That was the No. 1 reason. It was not even a hidden agenda," said a vice president of one of the senior issuers in Canada. Under NI 51-101, junior companies will be required to use qualified reserves consultants for year-end 2003 to independently audit or evaluate at least 75 percent of proved plus probable reserves using projected prices and costs and discounted at 10 percent. The remaining balance will be independently reviewed — a more limited investigation than an evaluation or audit.

While this provision, on the surface, is contrary to laissez-faire policies, virtually all juniors and seniors already use third-party reserves consultants in part as required by collateral-based credit lines and as expected by the public market. Juniors say that seniors should not be exempt.

John Essex, head of operations at Bow Valley, a junior issuer, said, "There is a risk that senior issuers



Under new Canadian guidelines, operators in the structurally complicated, highly faulted Alberta foothills, pictured here, will be limited to reporting proved reserves on undrilled acreage to direct offsets with good geological control.

are building a Chinese wall between the operating and reserves sides of the company. In-house estimates can cross to the point where they are biased because of the pressures for company performance," he said.

Essex is chairman of the Canadian Oil and Gas Evaluation Handbook (COGEH) standing committee. The NI 51-101 regulations refer to the newly released handbook on certain technical matters, including reserves definitions.

Differences between regulations issued by Canada Securities Administrators and the SEC may be

Continued on next page

Cross-border, in-country war of words



The major issuers in Canada (producing at least 100,000 BOEPD) successfully lobbied to be excluded from new Canadian National Instrument 51-101, saying that those regulations would undervalue them and make them takeover targets by U.S. companies.

Ironically, however, the U.S. Securities and Exchange Commission rules seem to be more conservative.

John Etherington, managing director of PRA International Ltd., said, "On paper, if you look at the words of the SEC, then the SEC is more restrictive."

Now those major issuers say that they have no problems with Canadian rules. **Phillip Chan**, manager of petroleum engineering at Talisman Energy Inc., who was part of the lobbying campaign, said that major issuers argued against the original Alberta Securities Commission taskforce recommendation that 90 percent certainty at the single-well level be required to report proved reserves.

"When the taskforce tightened those definitions, we debated this issue," said Chan. The ASC has relaxed that proposed rule since then and has settled

on a 90 percent certainty level at the aggregate level.

Off the record, Canadians are still sticking to their assertion that Canadian E&P companies are undervalued vs. U.S. companies. More than one Canadian referred to one of several acquisitions of Canadian interests in 2001 by U.S. companies, saying that after the transaction was completed, the U.S. company moved probable reserves into the proved undeveloped category.

A manager of the U.S. company agreed that the company had done this, but with good reason. He explained that the Canadian company had originally been advised by the outside reserves consultant that the reserves were true PUDs (proved undeveloped reserves) and could be reported that way. However, the Canadian company wanted to keep its finding-and-development (F&D) costs low because they are a major gauge of company performance in Canada and are accorded more importance than PUDs are in the U.S., some say.

So it chose to book them as probable reserves. If the company had chosen to book them as PUDs, then the following fiscal year, it would have had to allocate development costs to the reserves and shift them to the proved producing category, which would result in no increase in proved reserves but increases in F&D costs.

Please see War of Words on Page 6

significant enough in some cases to warrant close scrutiny by investors trying to compare relative values of E&P companies on either side of the border.

At the heart of these made-in-Canada changes was an attempt at more financial transparency for investors. While the Enron scheme hoodwinked investors on a grand scale, on a smaller scale, investors were duped by misrepresentations in the mining and E&P industries in Canada a few years ago. The Bre-X gold scandal was followed by four takeovers of Canadian E&P companies in 1998 — Blue Range Resource, Remington Energy, Amber Energy and Barrington Petroleum — in which reserves were reported to be overstated.

These were flashpoints for implementing the new disclosure rules, adding impetus to the work of the Alberta Securities Commission task force which eventually released draft recommendations that universally have drawn more praise than criticism.

Statistics, damn statistics, etcetera

Some Canadian companies plan to use a statistical aggregation method up to the field level before totaling, which critics say will cause proved volumes to be greater than those under SEC rules. COGEH allows the use of aggregation without specifying exactly how this is to be done. The CIM/SPEE plans to provide details in the soon-to-be-published Vol. 2 of COGEH, which is expected to provide additional guidance, but not make major changes.

Investors will have to understand the ramifications of probabilistic aggregation of reserves — a tall order considering that deterministic, not probabilistic, models are traditionally used for valuations. Even engineers trained in statistics are questioning the effect of this in practice and the mixing of probabilistic and deterministic methods in COGEH.

Although the Canadian regulations actually skirt the aggregation issue altogether, they do not preclude its use. This means that COGEH becomes the de-facto standard, allowing for the beneficial “portfolio effect” of aggregation of proved reserves.

COGEH cites as a rule of thumb that an evaluator can arithmetically add entity- or field-level deterministic estimates of proved reserves of lesser probability (for instance, a judgmental > P65) that will result in a greater overall probability (P90) at the portfolio or aggregate level, provided enough entities are added together.

“There may be scenarios in which the COGEH aggregate, constant-price-case proved volumes will exceed those estimated using SEC guidelines because of a difference of philosophy on probabilities and

aggregation,” said **John Etherington**, managing director of PRA International Ltd. He is working on Volume 2 of the handbook.

While probabilistic aggregation of proved reserves from different wells or reservoirs within a given field may be acceptable to the SEC, the agency says this “can result in larger reserves estimates than simple addition would yield. We require a straight forward reconciliation of this for financial reporting purposes.”

Using aggregation, the more properties in the portfolio, the greater the portfolio effect, so larger leaseholders benefit more than smaller ones. Large producers will be justified in booking greater field-level proved reserves with correspondingly lower certainties because when the reserves from numerous properties are added together, the overall certainty level significantly increases. On the other hand, to meet the target P90, companies with thin portfolios (fewer properties) may have to carry fewer field-level reserves

on the books with correspondingly higher certainty levels.

If the small and large companies are partners in a field and are both clients of the same consultant, “this could result in an evaluator having different reserves estimates for the same field,” said one evaluator in Canada.

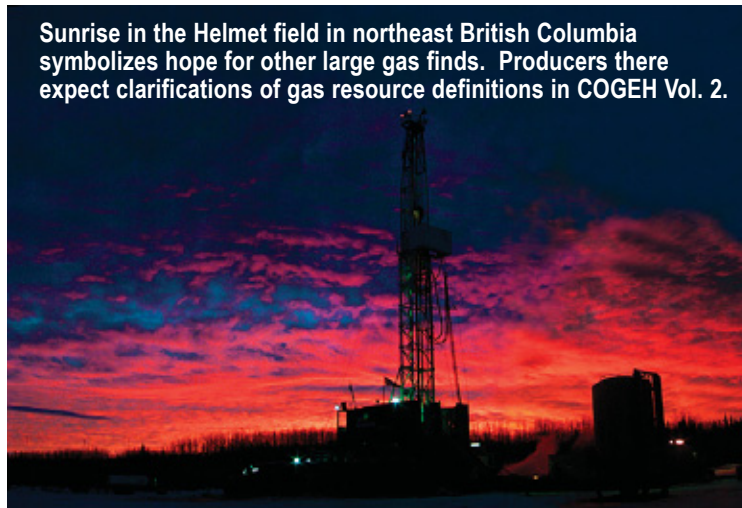
This threatens to confuse investors — the very group that Canadian companies want to attract by reporting reserves under legislative standards for the

very first time, some observers say. One Canadian petroleum evaluation engineer flatly said, “Investors will not understand aggregation.”

Etherington also said that aggregation causes a problem when a large company divests individual properties. “Before taking a property to market, a seller will have to reconcile differences by ‘disaggregating’ at the field level so buyers are not upset by P60s,” he remarked. Proved reserves for public disclosure that are different than proved reserves on a property-by-property basis for commercial purposes (acquisitions and divestitures) may require more than one engineering report, say critics.

Those in the U.S. used to equating P90, P50 and P10 numbers to probabilistic analysis are also in for a surprise, because the Canadian guidelines use those numbers in a deterministic sense. “COGEH promotes the concept that a deterministic estimate has an inherent ‘inferred’ associated certainty level,” said Etherington. “In a philosophical sense, it’s mixing probabilistic and deterministic. Neither the SEC or SPE (Society of Petroleum Engineers) will support COGEH’s current approach to aggregation.”

Aside from creating different standards between



Sunrise in the Helmet field in northeast British Columbia symbolizes hope for other large gas finds. Producers there expect clarifications of gas resource definitions in COGEH Vol. 2.

NI 51-101—Cont. from Page 5

U.S. and Canadian companies, aggregation has its advocates, who say that it better reflects real-world risks when dealing with large and small companies. "I support the portfolio effect," said **Rob Morgan**, vice president of engineering at Petrovera Resources Ltd. "The success or failure of a single well or reserves entity is a more significant element of a junior company's portfolio and thus poses a greater risk than the same well or entity for a senior producer."

While most of the debate is focused on the differences between U.S. and Canadian standards, others point to compatibilities. **Glenn Robinson**, the senior petroleum evaluation engineer at the ASC, said that he presented NI 51-101 and COGEH to the SEC petroleum engineers and after an informal review, they commented on the similarities of definitions for proved reserves. "We are singing out of the same hymn book," one SEC engineer told Robinson, according to him.

As far as disaggregating for divestitures, Robinson, a former president of Sproule Assocs. Ltd. consulting firm, said, "This is a big red herring that everybody's running around with. The SEC does not recognize probable reserves, so the financial guys have glommed on proved reserves."

He recommended that buyers and sellers look at "expected reserves" of the marketed properties, which he equates to P50s or proved plus probable reserves. Because probables are not recognized in the U.S., "proved reserves have been driven up to where they are above expected reserves," Robinson remarked.

More differences, similarities

COGEH allows for the booking of proved reserves

in subject or analog EOR fields with successful pilot wells or projects. Although COGEH differentiates its definition from the SEC one, in truth, the SEC interpretation was published in 2000 and is similar to the Canadian guideline.

"The SEC has not changed its definitions for booking EOR reserves. It just reinterpreted and clarified the definition to allow the booking of reserves through reliance upon appropriate analogs with successful pilots or full-scale operations," said Ron Harrell, CEO at Ryder Scott. A review of comment letters to the CSA indicates that this issue was not extensively debated and is presumably not a hot button topic.

For the first time, Canadian companies will be subject to a reserves definition that specifies that proved reserves extensions on undrilled acreage are generally limited to directly offsetting drilling spacing units within good geological control. Those companies will also be restricted from booking proved reserves below the lowest known penetrated hydrocarbons (LKHs). Both of these are similar to SEC regulations and should not cause problems in compliance because they constitute good engineering practices, even though lately some companies have made compelling cases for booking reserves below wellbore LKH based on MDT pressure-gradient data.

Ultimately, E&P companies, independent evaluators and investors will have to see how these new rules are interpreted and applied beginning at year-end 2003. Between now and then, study and debate will be at the forefront.

Phillip Chan, manager of petroleum engineering at Talisman Energy Inc., said, "The interpretation is not resolved yet. The rules are."

War of Words—Cont. from Page 4

"In Canada, we look at F&D costs. We prefer to drill and book reserves at the time of drill," the manager said.

Henry Lawrie, a consultant at Ross Smith Energy Group and the former chief accountant at the ASC, criticized this Canadian practice. "If I am a shareholder, then I resent that the company did not report PUDs, because then it is undervalued. What they say is conservative is nonsense, because they are understating reserves."

Lawrie faults the current calculation method, saying that the soon-to-be-replaced 2-B Canadian guidelines ignored F&D costs at beginning of year and at year end. He added that NI 51-101 solves this problem by requiring a calculation for F&D costs whereby they are derived by adding the total costs incurred for the year to year-end accruals minus beginning-of-year accruals divided by increases in proved reserves.

This method has its critics though, as **Glenn Robinson**, the senior petroleum evaluation engineer at the ASC, said, "Trying to calculate F&D costs at one

point in time is nonsense." Beyond that, he cited what he believes is a more fundamental problem with the calculation — the mandated use of an artificial 6-to-1 ratio for conversion of gas to equivalent oil volumes.

Robinson said that F&D costs ought to be calculated on a value basis, so that the net economic return for oil in the ground and the net return for gas in the ground reflect individual commodity prices and associated expenses. This method would take into account differences in prices between such commodities as light and heavy oil where the differential is significant.

Others say that even though the 6-to-1 conversion perhaps overstates the BOE of gas relative to its value contribution, successful government regulation of an alternative value-based method would be almost impossible under a standardized measure approach. Lawrie said that it would be difficult to get companies to change from the 6-to-1 ratio, which is consistent with the Canadian Institute of Chartered Accountants guidelines for calculation of depreciation, depletion and amortization.

There is universal agreement on one issue — they all agree to disagree.



Data from pressure limits tests are not compelling enough to prove up reserves below LKH, says SEC

OIL & GAS JOURNAL

Editor's Note: This revised excerpt, from an article that the Oil and Gas Journal planned to publish June 23, summarizes a case study

presented at the Society of Petroleum Engineers forum with the U.S. Securities and Exchange Commission late last year. Tom Gardner, vice president at Ryder Scott, and Ron Harrell, CEO, cited several "mini case studies" in their article.

This industry presentation to the U.S. SEC focused on using pressure-limits testing to extend a proved reservoir limit downward in a reservoir below a log-derived lowest known gas level to the apparent gas-water contact (GWC) from the pressure-limits test. Presenter **Fred Goldsberry** of WaveX Inc. gave a plausible reason for the necessity of lowering a proved contact in an offshore gulf gas reservoir.

Drilling a producing well downdip from the discovery well is considered neither commercial nor necessary to drain the reservoir. The operator, however, in this case was seeking to increase the borrowing base to fund additional development and questioned whether a downdip well had to be drilled to prove up reserves used as collateral.

Goldsberry discussed how deep the proved limit can be pushed below lowest-known gas by pressure-limits testing. He proposed testing the well in radial flow and using the distance of a radius of investigation that encounters no reservoir limits to be accepted as the minimum distance to a GWC. The acceptance of the radius of investigation as the minimum distance to a GWC creates a lower

lowest-known gas contour. The concept of pushing the proved GWC lower using pressure-limits testing was pursued further when the presenter discussed an elimination check of the geologic map.

Goldsberry reasoned that if the mapped distance to each succeeding boundary change is known, perhaps the evaluator can successively identify map features with increasing radii and extend LKG downdip on the map. The idea is that as long as the evaluator confirms the limit with a slope shift in the pressure data plot at the appropriate radius of investigation, it is logical to assume that a downdip limit has not been encountered.

The various limits inferred by slope changes in the drawdown test data confirmed the accuracy of the geologic map and seismic data. After confirming that several observed reservoir limits closely corroborated the map data, another boundary was seen that tied with a seismic anomaly believed to be a gas-water contact.

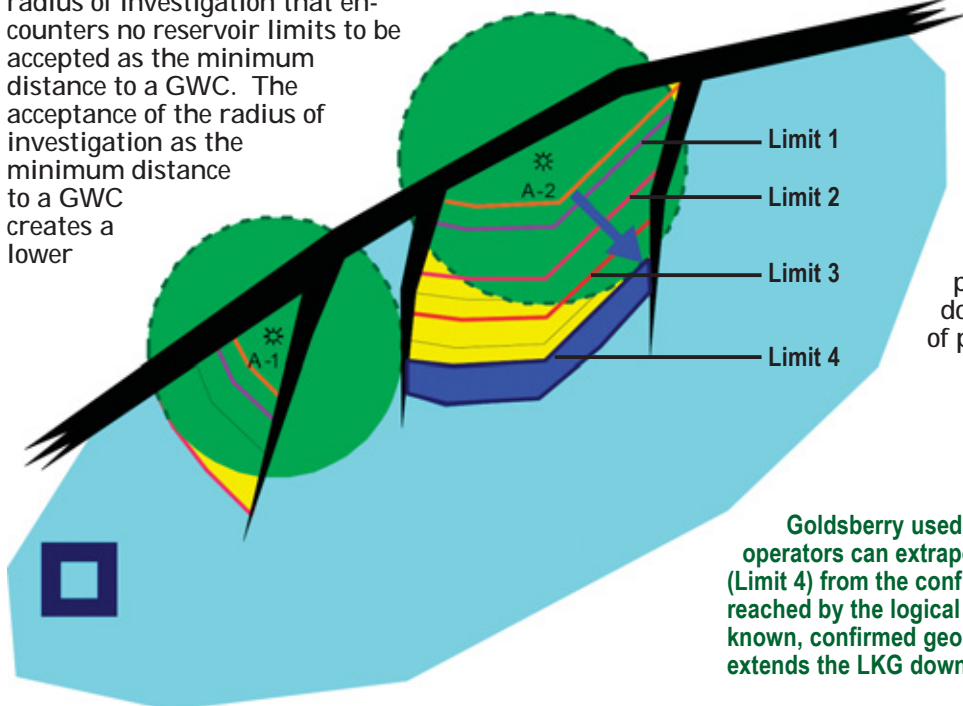
The questions posed to the SEC engineers were:

- Can the clear radius of investigation be used to push the LKG downdip?
- How many additional limits can be used to extend the LKG and what kind of corroborating evidence is necessary?

In response to the proposed use of pressure-limits tests to push the proved contact below the lowest-known gas from the log data, one SEC engineer stated that he would be "...very uncomfortable with doing that based on seismic and pressure-transient analysis."

He reasoned that although an evaluator may be able to determine the contact, he still has no data on the reservoir below the lowest known gas, including saturations, porosity and net pay.

The SEC engineer said that the presenter demonstrated a very good method of determining probable reserves but that this case does not rise to the level of certainty of proved reserves by SEC standards.



Goldsberry used this slide to question whether operators can extrapolate to an "effective gas water contact" (Limit 4) from the confirmed lowest known gas. Limit 1 is reached by the logical extension of the LKG. Limit 2 is the known, confirmed geologic limit extended to LKG. Limit 3 extends the LKG downdip by same logic.

RS Canada will clarify reporting issues for clients



National Instrument 51-101 calls for an independent reserves report or audit to be done annually for junior issuers (or those producing less than 100,000 BOEPD). In addition, Canada has approved an Alberta Securities Commission taskforce recommendation that evaluators do whatever work is necessary to eliminate most disclaimers. The companion policy to the national instrument states that the report should not

contain "a reservation, the cause of which can be removed by the reporting issuer."

In one comment letter to the provincial securities commissions, the chairman of a junior issuer stated that the mandated evaluations would be a cost burden and double the time and costs to prepare an independent report. "This is not the case. Any added costs should be minimal," said **Andy Thompson**, vice president and manager at the Ryder Scott Canada office.

Henry Lawrie, former chief accountant at the ASC and a consultant at Ross Smith Energy Group, said, "The vast majority of cases can be dealt with by reasonable cooperation between the independent reserves consultant and the independent financial auditor."

Under impending Canadian regulations, both internal and external evaluators will have to shoulder more responsibilities in issuing reserves reports. Consultants typically publish disclaimers stating that they use ownership interests, operating costs, payout balances, prices and product classifications without independent verification. Those disclaimers also state that the client is responsible for the accuracy of data.

"Some third parties have accepted operating costs without verification," said Lawrie. "However, even if the opex looks reasonable, the consultant should test some of them. If those don't test out, then the consultant should check the operating cost statements." This includes asking the independent financial auditor for a comfort level on the cost statement.



Thompson

Glenn Robinson, the senior petroleum evaluation engineer at the ASC, agreed that evaluators will have to improve communications with auditors, but that it will not entail too much additional work. "An evaluator can piggyback on the auditing work by getting a letter from the accountant attesting to the financial numbers. The evaluator will also have to state that the study was done according to COGEH (Canadian Oil & Gas Evaluation Handbook)."

Thompson remarked that he and his staff are ready to field questions about the impact of the new regulations and advise clients so the transition is smooth. "Until the regulations become effective and the aggregation method and ramifications are clearly understood, we will continue to estimate reserves by current definitions," he said. (See article section on aggregation, Page 5.) "There certainly will be gray areas where the interpretation could go one way or another after we apply the new definitions. Ryder Scott will clarify those issues on behalf of our clients through discussions with the regulatory agency."

For more information on compliance procedures, contact Thompson at andy_thompson@calgary.ryderscott.com.

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