**This paper is submitted as a comment paper on the proposed changes to NI 43-101.**

# GOING PRIVATE TRANSACTIONS IN RESOURCE COMPANIES

# LIMITATIONS OF CURRENT LAWS IN ONTARIO

The purpose of the *Securities Act* is to provide protection to investors from (a) unfair, improper or fraudulent practices; and (b) to foster fair and efficient capital markets and confidence in capital markets.[1] Securities Commissions across Canada are empowered to apply a wide range of remedies to carry out its mandate. Securities Commissions across Canada augment the *Securities Act* with policies to guide investors and Courts to interpret the *Securities Act* and, where there is agreement across Provincial lines, publish National Instruments that have the force of legislation.

The potential for abuse of regulations intended to protect investors is not novel. In a section on regulatory delegation to market participants, Armour et al. write: "By granting market participants discretion, of course, principles-based regulation opens the door to potential abuse."[2] Discretion can be nuanced, as I will explain in the context of one policy and two National instruments which, taken together, are intended to provide layers of protection for investors in resource companies – **Ontario Securities Commission *Policy 9.1*** (the "Policy"); **NI 43-101 Standards for Disclosure of Mineral Projects** and **NI 53-101 Standards for Disclosure of**

[1] *Securities Act*, R.S.O. 1990 c. S 5, s. 1.1
[2] Principles of Financial Regulation, Armour et al., Oxford Press, 2016, p. 550.

**Oil & Gas Activities** (the "National Instruments"). In these cases, the "discretion" is composed of the ability of market participants to adopt the organizational elements contemplated by the Policy and apply their discretion to the National Instrument disclosure paving the way for transactions to be carried out that appear to be fair and balanced but in fact deprive minority shareholders of substantial benefit. Issuers and acquirers in complying with the National Instruments can rely on third party agents to issue "fairness opinions" without those agents doing independent substantive work to surface the values on which they opine as "fair". This paper will demonstrate the deprivation and unfairness after a discussion of the Policy, the National Instruments, and the processes through which they can be applied to going private transactions and merger agreements laundered by Ontario courts through "Plans of Arrangement" ("Arrangements"). In effect, I will set out circumstances where the regulations are co-opted by market participants to carry out transactions tantamount to fraud. First, a bit of background.

## Arrangements

In its five -year review of the *Securities Act* (Ontario) in 2003, the review committee concluded that rules applicable to takeover bids would remain separate from the law pertaining to Arrangements despite the reality that both comprise takeover transactions. The separation was determined on the basis that the law regarding Arrangements developed as a principle-based approach intended to have flexibility, contrasted with the rules-based law regarding takeover bids. Ontario law firm Stikeman Elliot published an article [3] describing Arrangements

[3] Canadian Plans of Arrangement: An Attractive Structure for the Cross-Border Merger | Stikeman Elliott

as having certain advantages over rules-based laws regarding takeover bids including a claim that Arrangements ***"can make it difficult for disgruntled securityholders to attack the merger once the court has determined the "fairness" of the transaction."*** It is this feature of Arrangements that make such transactions attractive to entities wishing force minority shareholders to approve transactions where they might dispute the values as being "unfair", a theme I will develop in some detail herein to demonstrate that abuse is not just theoretical but to a certain extent endemic in this "principles-based" approach.

The law regarding Arrangements was tested at the Supreme Court of Canada in a now famous case *BCE Inc. v 1976 Debentureholders* 2008 SCC 69 (the "BCE Case"). The BCE case origins began when Jim Leech, then Chief Executive Officer of the Ontario Teachers, launched a leveraged buyout of BCE Inc. proposing an Arrangement whereby all BCE shares would be purchased by the acquiring entity through the Court supervised Arrangement process. Jim was a classmate of mine at Royal Military College of Canada and is today Chancellor of Queen's University, so the case piqued my interest at the time. It was a bold move but involved the undisputed outcome that a group of debenture holders' unsecured debentures would suffer a degraded credit position when the billions of acquisition debt resulting from the Arrangement would be piled on top of the debt they held, and their investment suffer a loss in value owing to a higher risk of ultimate default. The debenture holders brought a proceeding, and the issue ultimately was decided by the Supreme Court of Canada who in a nutshell dismissed the debenture holders' complaint on the basis "they got what they bargained for" and were entitled to no more. In my opinion, the SCC judgment gutted the oppression section of the

*Canadian Business Corporations Act* (CBCA) [4]which like its Provincial counterparts was enacted as remedial legislation to provide a remedy to a security holder when the conduct of directors of the corporation was oppressive, unfairly prejudicial to or unfairly disregarded the interests of the complainant security holder.

Arrangements are governed by s. 192 of the CBCA[5] and similar provisions of Provincial corporate Acts which mandate that proposed Arrangements receive court approval. One test the approving Court applies is whether the Arrangement is "fair and reasonable". The Acts lack any objective standard of what is "fair and reasonable" leaving that determination to the Courts should a transaction become subject to dispute.

## The Policy

The Policy was put in place inter alia to protect minority shareholders during going private transactions[6] with the objective of establishing a process wherein minority investors would have reasonable prospects of receiving "fair value" for their interests and protect them from potential oppression by management or controlling shareholders. As eloquently stated by Patricia Virc in her Osgoode LL.M. Term Paper[7] over 20 years ago:

> "The creation of rules regarding related party transactions stems from a desire to guard against oppression of the minority. While oppression is traditionally an area of corporate law, the Ontario Securities Commission's proposed rule regarding, *inter alia*, related party transactions is an important development and is an appropriate area of regulation for securities regulators."

[4] *Canada Business Corporations Act (CBCA)*, s. 241
[5] *CBCA* s. 192
[6] Policy 3-37 (1977) O.S.C.B. 253; amended (1977) O.S.C.B 268
[7] Regulation of Related Party Transactions, Patricia A. Virc, Student number 869123115

Ms. Virc and I were married at that time.

The Policy was amended several times since its inception. In its current form it mandates disclosure and procedural protections for investors including the establishment of special committees of independent directors, "majority of the minority" voting rules for transactions involving more than 25% of the value of a corporation's assets; enhanced disclosure akin to prospectus-like disclosure; and formal valuations. As Ms. Virc described in her paper, the rules intended to make it possible for minority shareholders to have the information needed to help themselves.

The corporate response to this policy embraced the steps aimed at protecting minority shareholders' interests including expert valuations; special committees; and "majority of the minority" voting rules. Controlling shareholders quickly learned the rules of this game and in my opinion set out to establish processes that had the appearance of fairness while facilitating the controlling shareholders' objective which it can be reasonably inferred was to take out the minority shareholders at the lowest possible cost. In essence, this was an example of "regulatory capture" where the industry's inputs to the policies during the drafting phase resulted in policies that many in the industry knew or ought reasonably to have known could be used to abuse the minority.

## The National Instruments

Continuous disclosure obligations of reporting issuers are set out in National Instrument 51-102 which proscribes disclosure of forward-looking information (FOFI) unless the issuer has a

reasonable basis for the forward-looking information. [8] A specific exemption from this prohibition is provided in Part 4B (FOFI and Financial Outlooks) which states that this Part does not apply to disclosure that is subject to the requirements of NI 43-101 or NI 53-101.[9] Drafters of NI 51-102 recognized that future commodity prices were an essential input to the value of mining or oil & gas resource.

Each of NI 43-101 and NI 53-101 require extensive disclosure of the characteristics of the relevant resource property including expert input from a qualified person regarding items like geology, anticipated capital and operating costs, mining, or development methods, and *inter alia* estimates of the economic worth of the project based on Discounted Cash Flow (DCF) and Net Present Value (NPV) methodologies. Those economic estimates necessarily include projections of commodity prices. It is the projected commodity prices that create the opening for abuse.

Without impugning the character or conduct of any of the boards of directors or committees so established or the independence or objectivity of the experts they engaged to establish "fair value", the process was inadequate for reasons outside of the regulatory framework – the issue of valuation was and is a moving target and the issue of "fairness" too subjective to be of much assistance, in my opinion. The problem is exacerbated in the case of resource companies by the courts willingness and even eagerness to "qualify" as experts chartered business valuators whose methodologies were often atheoretical and inappropriate, a reflection of the widespread use of NPV and DCF approaches where the expert report relied on forecast prices

[8] National instrument 51-102 paragraph 4A.2
[9] National Instrument 51-102 paragraph 4B.1 (2)

for the underlying commodities disclosed in National Instrument compliant reports, and unimpeachable arithmetic discounting the unknowable into a "value" devoid of substance in volatile commodity markets. While the arithmetic was unimpeachable, the forecasts of commodity prices created a degree of freedom open to misuse.

Resource companies have characteristics that differ from typical operating companies. First, they have no ability to alter the amount of resource they have discovered and are in most respects "going out of business" the moment their mine or oil field starts production. Secondly and perhaps most importantly they have no ability whatsoever to control the price they will receive for their output once in production, commodity pricing being the outcome of global supply and demand and local government policies. The fact is that mining and oil & gas companies cannot influence the most telling inputs to the conventional approach to valuation – the future price of the commodity or the quantity of the resource that is present and recoverable. Through judicious use of commodity price projections, authors of going private transactions were and often did create a "value" that appears "fair" but departs from reality by a wide margin, typically in favor of the author of the transaction and at the expense of the minority the process was ostensibly designed to protect. I have reviewed many such "expert reports" and found none that directly confront the key valuation parameter – commodity price – other than through a subjective forecast.

While the valuation issues can be complex and perhaps expose the proponents of plans of arrangement more risk than they wish to absorb, many have turned to the same valuation firms for "fairness opinions" where the opining independent firm overtly disclaims having done any formal valuation and provides its opinion on "fairness" independent of value. In the case of an

Arrangement involving Canamax Energy, discussed herein later, the fairness opinion was provided by GMP Capital who were clear they had done no formal valuation in support of their opinion.

Fairness is a subjective term. There is a difference between price and value that is recognized in the Act in its definition of "material fact" as a fact or circumstance which could reasonably be expected to have a significant effect on the **price or value** of a security. [10] The "fairness opinions" referenced herein are unsupported by formal valuation and appear to base their concept of "fairness" on an analysis concerned solely with the trading price of the particular security. Corporate takeovers typically take place at prices that are a premium to trading prices extant in the period before the announcement of the takeover, which is implicitly evidence that "price" and "value" are not synonymous and can diverge widely. Insider Trading and "tipping" cases typically turn on the existence of a material fact that could reasonably have a significant effect on the price or value of the relevant security, and often involve improper profits earned by buying targets of takeovers based on undisclosed information that a takeover was likely, as was the case in Research in Motion's takeover of Certicom Corp., subject of an OSC enforcement action against Paul Donald. [11]

There have been numerous going private and take over transactions in the resource industry in the past two decades, most of which have been subject to the Policy. In each case, the sponsor of the going private transaction acted with independent legal advice from a reputable firm and engaged an equally reputable corporate finance firm to provide a "fairness opinion" that the

[10] Securities Act, s. 1.1
[11] Paul Donald 2012 ONSEC 26

transaction as proposed was fair to minority shareholders from a financial point of view. Courts typically defer to the expertise of the valuation firm rather than grappling with the complexities of valuation theory. Firms providing "fairness opinions" include KPMG; CIBC World Markets; GMP Capital; and TD Waterhouse (as examples) all of whom had sterling reputations. Despite this expert input many transactions were demonstrably unfair to minority shareholders, in my opinion.

How is this unfairness possible with all the effort to deal fairly with minority interests? The answer lies in the failure of the corporate finance firms either provide a "fairness opinion" unsupported by any formal valuation or fail to apply modern valuation techniques and instead rely on methodologies such as NPV and DCF that have been superseded by more advanced theories which expressly recognize that forecasts of commodity prices are unlikely to be useful in a world where commodity prices tend to be volatile in the face of global supply and demand pressures and cannot be reliably forecast.

Recognition of the volatile nature of commodity prices as a key determinant of the value of natural resource reserves is an outgrowth of the Nobel Prize winning work of Fischer Black, Myron Scholes and James Merton who developed a model for the valuation of stock options called the "Black Scholes" model. These financial experts recognized that returns on shares were randomly distributed and that the value of an option to buy a share was an equivalence between the probability that the share price would be greater than the exercise price of the option before its expiry and the probable cost of exercise of the option. They recognized that robust valuations required a stochastic process.

The use of Black Scholes to value stock options is accepted by Canadian Courts since adoption by the Court of Appeal for Ontario[12]. Financial experts soon found that there were parallels in valuation of companies whose fortunes were tied to volatile commodity prices and began to theorize that a more robust approach to valuation of these companies' assets was to value their resource properties as a "real option" on future commodity prices. While companies typically had enough history and expertise to reasonably forecast the cost of development of their resources, they were devoid of any reliable method to forecast future prices of the underlying commodities.

Black Scholes methodology provided a sensible answer. Rights to develop natural resources are not perpetual and, like stock options, have a known term. The future capital costs of developing the resources are far more subject to reasonable forecasts than commodity prices and likewise projected operating and ongoing capital costs less subject to forecasting error than future commodity prices. Input variables such as equipment costs; labor rates; tax regimes; etc. are the day-to-day concerns of management of resource companies and their ability to reasonably budget such costs unquestioned.

Armed with the knowledge of the likely capital costs of a mining or energy project and the range of operating costs likely to be encountered once the capital program is complete, valuators had a substantial portion of the hard data needed to value the resource. All that was left to know was the duration of the license to develop the resource, analogous to the term of a stock option, and the volatility of the commodity price. Financial literature started to see this

[12] *Ross v Ross*, 2006 CanLII 41401 (ON CA)

theory advance and expert valuation firms such as Mercers in the United States began to promote the use of Black Scholes to value proven but undeveloped energy resources.[13] The Black Scholes approach is a valuable complement to the conventional DCF and NPV methodology which provides more reliable outputs than either DCF or NPV, particularly when commodity prices are for the time being below the prices needed to profitably develop reserves.

Conventional DCF and NPV methodology produces negative present values when the commodity prices are low and projected cash flows negative. Implicit in such valuation is the assumption that future commodity prices will remain at uneconomic levels indefinitely. That is not how markets work. Low prices will see reductions in supply to the point of shortages at which point prices will rise, often sharply, until resource companies have the incentive to develop more supply. There is an old saying in the oil & gas industry: "The best cure for low prices is low prices".[14]

The Black Scholes inputs as applied to proven but undeveloped oil & gas reserves ("PUD's) are set out by Mercer's in the following table:

[13] How to Value Proven Undeveloped Reserves (PUDs) - Mercer Capital
[14] 'The cure for low oil prices is low prices,' energy expert tells Boom Bust — RT Business News

## Adaptation of Black Scholes Option Model

The PUD and unproved valuation model is typically seen as an adaptation of the Black Scholes option model. The Black Scholes option model is a widely used model used to develop the value of European-style options. The adaptation is most accurate and useful when the owners of the PUDs have the opportunity, but not the requirement, to drill the PUD and unproven wells and the time periods are long, (i.e. five to 10 years). The value of the PUDs thus includes both a DCF value, if applicable, plus the optionality of the upside driven by potentially higher future commodity prices and other factors. The comparative inputs, viewed as a real option, are shown in the table below.

**Comparative Inputs**

| Call Option on Share of Stock | | Proven Undeveloped Reserve (PUD) |
|---|---|---|
| Underlying share price | → | DCF value of reserve when developed |
| Strike price | → | Capex needed to develop reserve |
| Time to expiration | → | Time remaining on mineral lease |
| Dividend | → | Value decay resulting from waiting |
| Time value of money | → | Time value of money |
| Volatility of share price | → | Volatility of developed reserve value |
| | ↓ | |
| In-the-money value | → | NPV of project |

Source: Mercer's

Companies that are highly leveraged have similar characteristics. Conventional valuation techniques ignore the potential for economic recovery of these firms and fail to recognize that the assets of the company, even when currently having a realizable value less than the debt of the company, may nonetheless have substantial value base on the option-like characteristics of such entities. Aswath Damodaran, recognized as a world leader in valuation methodology, has taught his students in Advanced Valuation graduate courses at New York University Stern School of Management not to ignore that potential value. The value is real, present, and quantifiable. [15]

Going private transactions in debt ridden commodity-based companies is rife with abuse of minority shareholders who are easily persuaded their shares have little value and don't seem to

[15] valpacket3.ppt (nyu.edu)

question why the sponsor of the "going private" transaction is willing to "throw good money after bad" by paying to take the entity private. The answer is revealed by applying Black Scholes methodology to the equity of the company and discovering the surprising result that such entities can have very significant value despite the poor environment. Legendary gold investor Peter Munk became a billionaire by acquiring what appeared to be almost defunct gold companies when the gold price was so low it was uneconomical to produce the gold in their reserves.[16]

It is sensible to view the equity of a debt-ridden entity as a call option on the assets of the entity with a strike price equal to the value of the debt and a time to expiry equal to the duration of the debt. The assets of the company will experience fluctuations in value during the period until the debt becomes due and may well exceed the debt by a wide margin in that interval, giving the holder of the equity a substantial gain.

I experienced the frailty of the traditional valuation methods in litigation with my wife after the failure of our marriage. On the date of marriage, I owned common shares of a private company named Renegade Capital Corporation ("Renegade") which operated two profitable subsidiaries but was encumbered by significant debt at the parent company level. The date of marriage value of my common shares was subject of dispute.

My ex-wife hired a Chartered Business Valuator (the "CBV") who was also a Chartered Public Accountant and who the Court qualified as an "expert" for the purposes of valuation of my Renegade shares both on the date of marriage and the date of separation. I engaged the head

[16] Barrick Gold Corporation -- Company History (company-histories.com)

of the Finance faculty at York University Schulich School of Business who held a PhD in economics; a law degree; and was a Chartered Financial Analyst ("CFA") to simply value one of Renegade's profitable subsidiaries which was wholly owned by Renegade and which I believed to alone have value far exceeding the parent company's debt obligations. If that one subsidiary had a value exceeding Renegade's debt and the other subsidiary was profitable (which was not disputed) it is tautological that Renegade's common shares had value.

At trial, the presiding judge qualified the CBV who use a "comparable company" approach to valuation of one of Renegade's profitable subsidiaries and a DCF approach to the other. The judge disqualified the CFA who used the Capital Asset Pricing Model ("CAPM") to value one of Renegade's subsidiaries. CAPM is a recognized valuation approach while "comparable company" is atheoretical and often subject to abuse.

The CBV found the value of Renegade common shares to be *nil* on the date of marriage, adding together the value found for each of Renegade's profitable subsidiaries and subtracting Renegade's debt obligations. The CFA found the value of the one Renegade subsidiary he valued to be approximately $10 million greater than the value found by the CBV for the entire company using his "comparable company" approach.

During his *voir dire*, the CFA gave the following sworn evidence in respect of the comparable company EV/EBITDA approach used by the opposing CBV: [17]

[17] *Voir Dire* of Douglas Cumming, July 20, 2015. Copied from a paper written by Michael Blair for LAW9555B at Western University Law School dated February 14, 2021, titled "Garbage in – Garbage Out".

*"THE COURT: Is that what you meant when you referred to theoretical a few moments ago?*

*A. Atheoretical.*

*THE COURT: Atheoretical.*

*A. So, it is no theory behind comparables methods. They are as I joke about it in my MBA classes, they are the uninformed guy's approach to valuation and in – in practice, people that are making investment decisions would never solely rely on comparables.*

*The outcomes with comparables can vary widely depending on the particular comparables that are picked and in fact, most companies aren't directly comparable and so therefore, if you were to base any conclusions on a comparables method you really – and particularly for example if you are valuing a company with a unique business process, unique customers, different sets of competitors, you'd really be doing yourself a disservice because it's not something that you would formally rely on. "*

Cumming had also given evidence that he had never met me before being engaged; that he had no stake in the outcome of the dispute; and that he would have come to the same conclusion had he been engaged by the opposite party. The trial judge disqualified Cumming despite his

evidence being on all fours with the Supreme Court of Canada guidance on when an expert should be qualified to give evidence. [18]

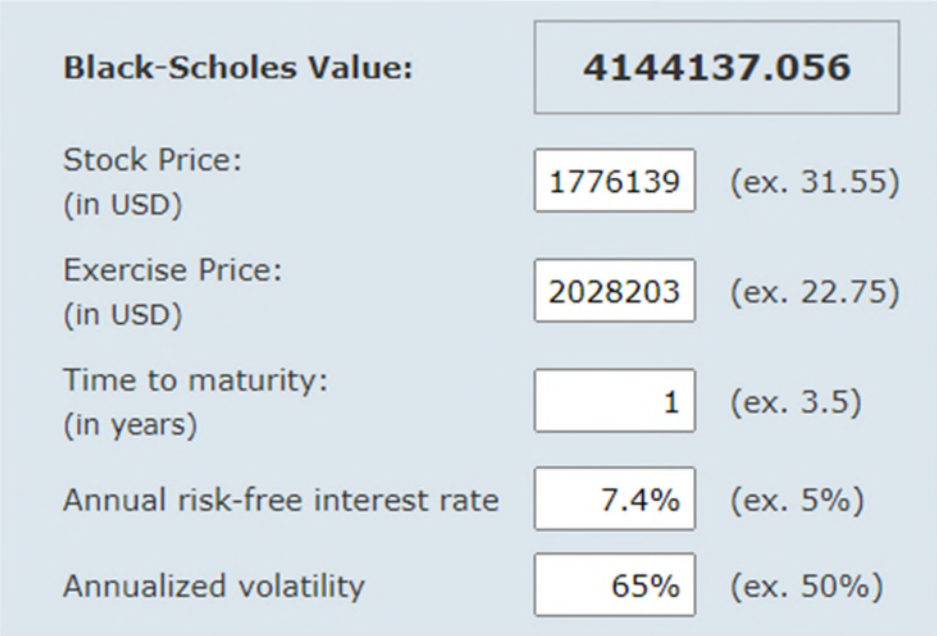
Neither the CBV nor the CFA carried out a valuation of Renegade using Black Scholes, which was uniquely suited to value Renegade given its level of indebtedness. The CBV report found that Renegade had debt of $20,282,030 on the date of marriage, and that Renegade had assets on that date he valued at $17,761,399. [19] Based on that finding, the CBV concluded the common shares of Renegade had a nil value on the date of marriage. Neither the Court nor the CBV gave any thought to the undisputed fact that Renegade and its subsidiaries provided me with $15 million of income in the form of dividends and salary and bonus compensation from its operating units during the marriage or asked themselves why "worthless" Renegade shares on the date of marriage were worth some $8 million on the date of separation without having had any external equity financing during the marriage.

The Court also had before it an independent valuation of a stock option on shares of Algonquin Mercantile Corporation ("Algonquin") on the date of marriage[20]. Shares of Algonquin comprised the primary assets of Renegade on the date of marriage in that the operating subsidiaries of Renegade were in turn subsidiaries of Algonquin. The option valuation found that the median volatility of Algonquin shares in the two years before the date of marriage was 65% and estimated the then prevailing "risk free" interest rate was 7.4%. These data are all those necessary to value common shares of Renegade as an option with a strike price equal to

[18] *White Burgess Langille Inman v Abbott and Haliburton Co*., 2015 SCC 23 at 184
[19] Stern Cohen Report on the Valuation of Renegade dated September 25, 2012, marked as Exhibit * at Trial, Schedule 2A
[20] Valuation of Options in Algonquin Mercantile Corporation, June 8, 2011, by Capital Canada Limited.

the debt and a term of one year, the duration of Renegade debt which was reviewed by its bankers annually.

Based on those inputs, the value of Renegade shares valued as an option on the assets of the company was $4.14 million, not the *nil* value calculated by the CBV. In the result, the Court's inability to deal objectively with valuation caused injustice. I have no doubt that the CBV was both capable of valuation of Renegade using CAPM or Black Scholes, both of which are methodologies grounded in valuation theory, but he chose to use an atheoretical "comparables company" approach and chose the "comparables" to produce a result favorable to his client, and the Court acted unwittingly as his accomplice.




Oddly while the CBV found Renegade shares had no value on the date of marriage he found my portion of those shares had a value of approximately $3,705,000 on the date of separation some 13 years later which value arose without external equity financing in the interval between marriage and separation. The fact that the CBV found the shares had value on the date of

separation evidences the reality that those shares had value on the date of marriage as an option on the assets of Renegade which did, in fact, increase in value during the marriage.

It is this personal experience with Courts and experts that led me to study the role of experts, the theory of valuation, and the protections for litigants in Canadian courts. To that end, I completed the Advanced Valuation graduate program and the Stern School of Business at New York University in 2019 and the graduate diploma in Mining Law, Sustainability and Finance at Western University in 2021. During the Western program it became clear to me that NI-43101 and NI 53-101 (designed to ensure investors in mining and oil & gas companies received appropriate disclosure) and OSC Policy 9.1 were – in combination – subject to abuse.

## The Canamax Going Private Transaction

On December 18, 2015, Canamax Energy Ltd. carried out a going private transaction using the Plan of Arrangement methodology. [21] [22] [23] The company complied with all Securities Act requirements including establishment of a special committee, engagement of an independent expert "fairness opinion", and requiring a "majority of the minority" vote on the transaction. A circular containing the required disclosure was mailed to all security holders.[24] The required "fairness opinion" was attached as an Appendix. The transaction was duly approved by shareholders and the Plan of Arrangement ordered by the Alberta Court with minority shareholders receiving $0.67 per common share and $0.01 for each warrant outstanding.

[21] Canoils - Canamax Energy Ltd. Completes Going Private Transaction
[22] Go Private Transaction – Canamax Energy
[23] Microsoft Word - #656758-v3-Change in Corporate Structure.DOCX (sedar.com)
[24] Canamax - Special Meeting Circular.pdf (sedar.com)

The process followed was flawless for a 2015 going private transaction. But was it in fact "fair" to the minority?

While GMP Capital did provide a "fairness opinion" it is worth noting that GMP was clear about the limitations of its opinion, stating *inter alia "We have not been asked to prepare* ***and have not prepared a formal valuation of any of the assets or securities of the Company****"*. Instead, they relied on the "completeness, accuracy and fair presentation of all financial and other information, data, advice, opinions, and representations obtained by us from public sources, or provided to us by the Company or its affiliates or advisors . . . ". In a nutshell, GMP found the transaction to be fair from a financial point of view because the company and its management said it was.

Absent any attempt at formal valuation, the fairness opinion necessarily relied on the trading prices of Canamax securities as a proxy for "fair value" and the Canamax circular included such trading prices and price history. I found it interesting that no expert, lawyer nor judge gave seemed to give any thought to the difference between "price" and "value" which is explicitly recognized in the *Securities Act* where "material fact" and "material change" both refer to the relevant fact or change affecting the **"price or value"** of the particular security. [25] If price were synonymous with value no distinction would be needed.

Among other things, information provided by the Company included a "Reserves Report" which set out the "proven and probable" reserves of oil & gas held by the company and the capital cost to extract and produce those reserves; the audited financial statements of the Company;

[25] *Securities Act*, s. 1, 1 "material fact" or "material change" definitions.

and the Company's Management Discussion and Analysis ("MD&A") for the fiscal period ended December 31, 2014. Those documents included data on the actual cost of producing the commodities they company sold in that period and in my opinion would be likely to encounter in future periods undoubtedly varying owing to ordinary inflation and improvements in productivity.

The Reserves Report included an estimate of the NPV of the reserves which totaled a per share value of $1.47 based on a 10% discount rate. The company was taken private at $0.67 per share and no one on the board of directors, in management or apparently in GMP or the Company's legal advisors saw the situation as unusual or warranting more investigation. As was customary, the Reserves Report included a forecast of future commodity prices upon which the reported value rested and which, without doubt, would diverge materially from actual future experience. In addition, the NPV at a 10% discount rate would arguably be greater than the same value at a discount rate empirically derived as expected by energy investors in that timeframe. CAPM might readily have been used to determine such a rate. It was not.

The "real option" method of valuing resource reserves is a stochastic process that considers both the risk of lower prices (in which case the reserves are left undeveloped) and the risk of higher prices (in which case those reserves are exploited). The NPV approach is more deterministic and produces a value only as good as its assumptions on commodity prices.

The science of valuation has been evolving since the early 1950's when Nobel prize winners Franco Modigliani and Merton Miller first theorized that the value of a firm was independent of

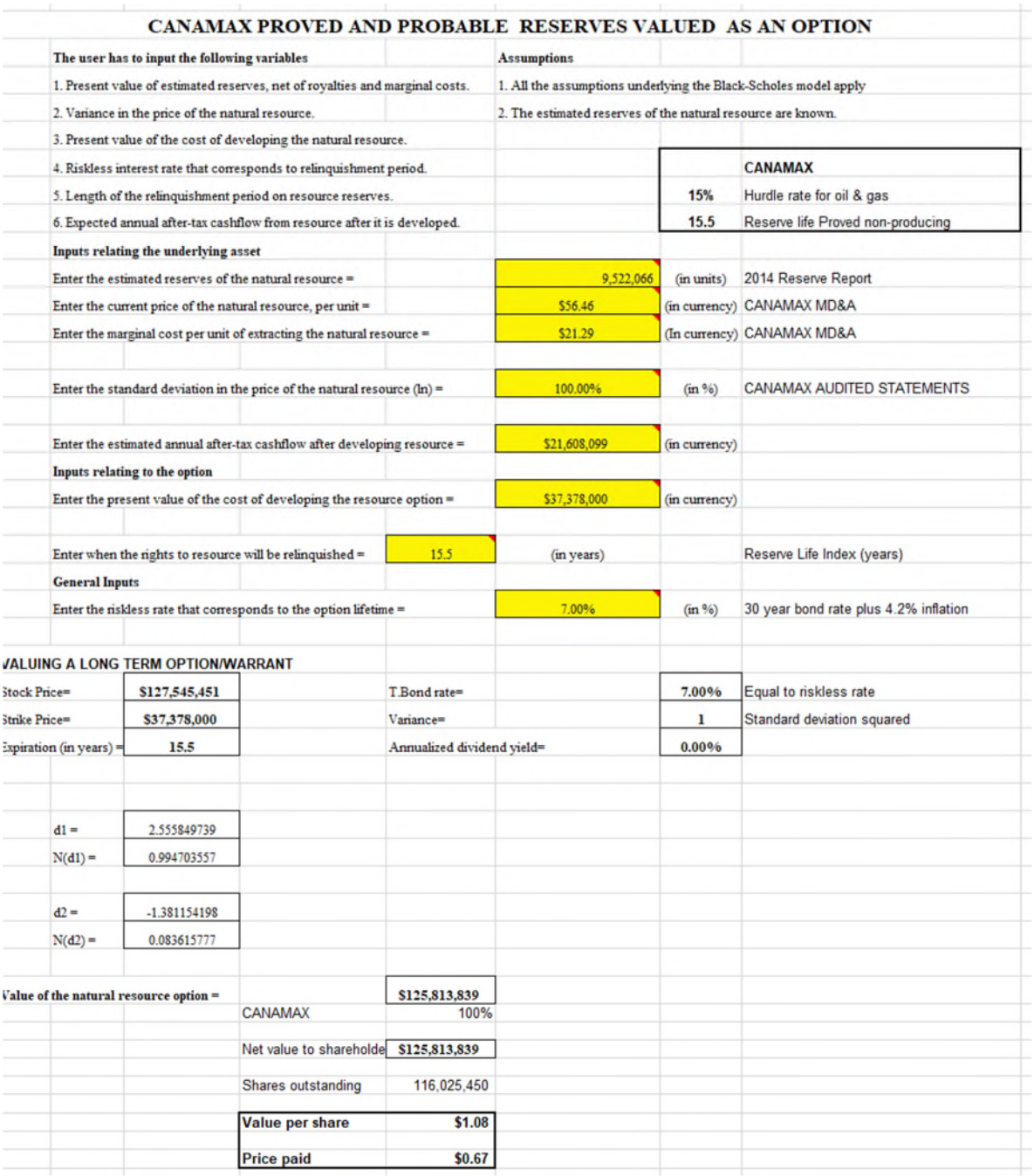
its capital structure or dividend policy [26]; and later work by Harry Markowitz, Merton Miller and William Sharpe who theorized that capital markets were "efficient" and that stock prices generally captured all information known to investors leading to valuation of a particular security comprising a formulaic approach to its relative risk (measured as *Beta*, the ratio of its volatility to that of the market as a whole) which gave rise to the CAPM theory of value. [27] [28] Two other Nobel laureates, Eugene Fama and Kenneth French, advanced that theory after demonstrating that small capitalization companies and companies with relatively high book value to market price ratios tended to outperform the market contrary to the theory of market efficiency and postulated a three-factor valuation theory [29]as an advance to the prevailing CAPM approach.

Later work by Nobel laureates Bob Shiller [30]and Richard Thaler [31] demonstrated that CAPM and even three-factor CAPM were frail in that their underpinning assumption that investors acted rationally was demonstrably false. Valuation experts have since adopted Black Scholes as the most reliable valuation methodology in certain cases, augmented by traditional NPV and DCF where reliable forecasts of future cash flows were possible.

Valuing resource deposits as "real options" using Black Scholes has recently become mainstream, used in conjunction with traditional concepts of DCF and NPV.

[26] Modigliani-Miller Theorem (M&M) Definition (investopedia.com)
[27] Harry Markowitz (investopedia.com)
[28] What is CAPM - Capital Asset Pricing Model - Formula, Example (corporatefinanceinstitute.com)
[29] Fama-French Three-Factor Model - Components, Formula & Uses (corporatefinanceinstitute.com)
[30] Robert Shiller's Views on the Efficient Markets Hypothesis | Free Essay Example (studycorgi.com)
[31] Are Markets Efficient? A Look at Nobel Winner Richard Thaler (moneyshow.com)

In the case of CANAMAX, the "real option" method using Black Scholes produces a value of $1.08 per share.



**CANAMAX PROVED AND PROBABLE RESERVES VALUED AS AN OPTION**

| | | | | |
|---|---|---|---|---|
| **The user has to input the following variables** | | **Assumptions** | | |
| 1. Present value of estimated reserves, net of royalties and marginal costs. | | 1. All the assumptions underlying the Black-Scholes model apply | | |
| 2. Variance in the price of the natural resource. | | 2. The estimated reserves of the natural resource are known. | | |
| 3. Present value of the cost of developing the natural resource. | | | | |
| 4. Riskless interest rate that corresponds to relinquishment period. | | | | **CANAMAX** |
| 5. Length of the relinquishment period on resource reserves. | | | **15%** | Hurdle rate for oil & gas |
| 6. Expected annual after-tax cashflow from resource after it is developed. | | | **15.5** | Reserve life Proved non-producing |
| **Inputs relating the underlying asset** | | | | |
| Enter the estimated reserves of the natural resource = | | 9,522,066 | (in units) | 2014 Reserve Report |
| Enter the current price of the natural resource, per unit = | | $56.46 | (in currency) | CANAMAX MD&A |
| Enter the marginal cost per unit of extracting the natural resource = | | $21.29 | (In currency) | CANAMAX MD&A |
| Enter the standard deviation in the price of the natural resource (ln) = | | 100.00% | (in %) | CANAMAX AUDITED STATEMENTS |
| Enter the estimated annual after-tax cashflow after developing resource = | | $21,608,099 | (in currency) | |
| **Inputs relating to the option** | | | | |
| Enter the present value of the cost of developing the resource option = | | $37,378,000 | (in currency) | |
| Enter when the rights to resource will be relinquished = | 15.5 | (in years) | | Reserve Life Index (years) |
| **General Inputs** | | | | |
| Enter the riskless rate that corresponds to the option lifetime = | | 7.00% | (in %) | 30 year bond rate plus 4.2% inflation |

**VALUING A LONG TERM OPTION/WARRANT**

| | | | | |
|---|---|---|---|---|
| Stock Price= | **$127,545,451** | T.Bond rate= | **7.00%** | Equal to riskless rate |
| Strike Price= | **$37,378,000** | Variance= | **1** | Standard deviation squared |
| Expiration (in years) = | **15.5** | Annualized dividend yield= | **0.00%** | |
| d1 = | 2.555849739 | | | |
| N(d1) = | 0.994703557 | | | |
| d2 = | -1.381154198 | | | |
| N(d2) = | 0.083615777 | | | |

| | | |
|---|---|---|
| **Value of the natural resource option =** | **$125,813,839** | |
| CANAMAX | 100% | |
| Net value to shareholde | **$125,813,839** | |
| Shares outstanding | 116,025,450 | |
| **Value per share** | **$1.08** | |
| **Price paid** | **$0.67** | |

Based on the “real option” methodology, a Court could reasonably consider the $0.67 per share price offered in the going private transaction unfair to the minority. It should be no surprise that the sponsors of the going private transaction and their advisors failed to use the modern and more reliable valuation approach since they benefit from the lower price, in the case of the sponsors, and a fee in the case of their advisors. Only the Court can speak for the minority shareholders and the Court, absent its own independent expert input, is inadequate to this task. Injustice not only results but also has been sanctified the Court process.

## The Pengrowth Energy Going Private Transaction

On January 20, 2020, Cona Resources (Now called Strathcona Resources) acquired Pengrowth Energy through a Plan of Arrangement.[32] Pengrowth at the time had oil & gas reserves of 449 million barrels of oil equivalent, of which 29% were natural gas reserves and the balance oil. Pengrowth had debt and third-party liabilities of $1.1 billion and at the going private price of $0.05 per share the value of its 552 million shares was $28 million according to Tudor Pickering Holt (“TPH”), advisory firm providing the “fairness opinion”. Nowhere does TPH disclose that the NPV of Pengrowth’s reserves at a 10% discount rate was estimated at $2.6 billion in the company’s NI 51-101 reserves report prepared by *.

That omission might have been a clue to what was going on. Using the $1.1 billion third-party liability figure from the 2018 annual report and the $28 million "fair value” TPH opined, the value of Pengrowth’s assets was $1.13 billion at the time of the going private transaction. Black

[32] About Strathcona | Strathcona Resources Ltd.

Scholes provides a simple way to test whether than “fair value” was fair, since all the needed data for a Black Scholes valuation are present even if not found in one place.

Valuing Pengrowth’s assets as a “real option” on future oil & gas prices, the “strike price” is set as the debt or $1.1 billion; the current price at the market value of the assets or $1.13 billion; and the duration of the option at the duration of the third-party liabilities. While not all the debt was due within one year, the over-leveraged balance sheet points to a conservative assumption that the duration of the debt was 1 year. It would be unusual for the bankruptcy of such a large and complex company to be completed within 1 year if the company had sought creditor protection which it had open to it. I estimated the volatility of Pengrowth assets to be 65%. I calculated the daily volatility of oil & gas prices as 2.6% in 2018-2019 and multiplied that by the square root of 230 trading days to arrive at the 65% figure. The annual risk-free rate combines real growth of 3% with the prevailing inflation rate of 3%, an approach known as the “implicit real rate of return”. It is preferable to the commonly used 10-year bond rate owing to the high level of central bank intervention in bond markets which distort market yields.

Using a Black Scholes calculator (there are dozens of them online) it is possible to estimate the value of Pengrowth's assets as a "real option":

**Black Scholes Calculator**

| | | |
|---|---|---|
| Type of Option | | Call Option |
| Stock Price ($S_0$) | $ | 1,130,000,000.00 |
| Exercise (Strike) Price (K) | $ | 1,100,000,000.00 |
| Time to Maturity (in years) (t) | | 1.00 |
| Annual Risk Free Rate (r) | | 6.00% |
| Annualized Volatility (σ) | | 65.00% |
| Option Price | $ | 325,366,487.53 |

| Additional Calculation Parameters | |
|---|---|
| $\ln(S_0/K)$ | 0.027 |
| $(r+\sigma^2/2)t$ | 0.271 |
| $\sigma\sqrt{t}$ | 0.650 |
| $d_1$ | 0.459 |
| $d_2$ | (0.191) |
| $N(d_1)$ | 0.677 |
| $N(d_2)$ | 0.424 |
| $N(-d_1)$ | 0.323 |
| $N(-d_2)$ | 0.576 |
| $e^{-rt}$ | 0.94176 |

Using this valuation methodology, the value of Pengrowth common shares returned is $325 million or approximately $0.59 per share, about 12 times the "fair value" found by TPH.

Once again, minority shareholders were abused by the Arrangement process.

## The Fortuna Silver Takeover of Roxgold Arrangement

On April 26, 2021, Fortuna Silver ("Fortuna") announced an agreement to take over Roxgold Inc. ("Roxgold") in an $884 million deal (about $1.1 billion in Canadian funds) to take place through an Arrangement. [33] The press release [34]crowed about the benefits of the proposed deal citing larger scale, low costs, greater liquidity, a stronger balance sheet and greater prospects for growth.

The key asset of Roxgold was its Yaramoka gold mine in Burkina Faso which was subject of a December 2017 NI 43-101 report prepared by SRK Consulting (Canada) Inc., an independent expert firm (the "SRK Report"). [35] The SRK Report contained all the information needed to vale the Yaramoka mine using Black Scholes.

At the time of the announcement Fortuna Silver shares (FVI.TO) were trading on the Toronto Stock Exchange at $7.90 a share and the proposed consideration for the takeover put a value on Roxgold shares of $2.73 a share, a 42.1% premium over the 20-day volume weighted average share price for the period ending April 23, 2021. Shareholders of both companies approved the transaction in reliance on the management information circular (the "Circular") issued by Fortuna which included *inter alia* a fairness opinion provided by Scotia Capital Inc. ("Scotia"). In its fairness opinion, Scotia wrote: **"We have not been asked to prepare and have not**

[33] Canada's Fortuna Silver to buy Roxgold in $884 million deal | Nasdaq
[34] Fortuna Silver Mines Inc. | Fortuna and Roxgold Agree to Business Combination Creating A Low-Cost Intermediate Global Precious Metals Producer
[35] Fortuna Silver Mines Inc. | Yaramoko Mine, Burkina Faso

**prepared a formal valuation or appraisal of the securities or assets of the Company, TargetCo, or any of their affiliates, and the Opinion should not be construed as such."**

I read the press release. On its face, the takeover made sense to me, and I purchased 1,000 shares of Fortuna to open a position and began my due diligence analyses. Using the data from the Yaramoka NI 43-101 report I prepared a Black Scholes evaluation of the mine which comprises the asset of Roxgold.

**ROXGOLD YARAMOKA PROJECT VALUED AS AN OPTION**

| | | | | | |
|---|---|---|---|---|---|
| **The user has to input the following variables** | | | **Assumptions** | | |
| 1. Present value of estimated reserves, net of royalties and marginal costs. | | | 1. All the assumptions underlying the Black-Scholes model apply | | |
| 2. Variance in the price of the natural resource. | | | 2. The estimated reserves of the natural resource are known. | | |
| 3. Present value of the cost of developing the natural resource. | | | | | |
| 4. Riskless interest rate that corresponds to relinquishment period. | | | | | ROXGOLD |
| 5. Length of the relinquishment period on resource reserves. | | | | 15% | Hurdle rate for mine operations |
| 6. Expected annual after-tax cashflow from resource after it is developed. | | | | 7 | Life of mine in years |
| **Inputs relating the underlying asset** | | | | | |
| Enter the estimated reserves of the natural resource = | | | 908,000 | (in units) | NI 43-101 report - Proven and probable |
| Enter the current price of the natural resource, per unit = | | | $1,850.00 | (in currency) | Current gold price |
| Enter the marginal cost per unit of extracting the natural resource = | | | $695.00 | (In currency) | NI 43-101 Life of Mine all in sustaining c |
| Enter the standard deviation in the price of the natural resource (ln) = | | | 50.00% | (in %) | Estimated variance last 5 years |
| Enter the estimated annual after-tax cashflow after developing resource = | | | $97,383,000 | (in currency) | Assumes 35% tax rate |
| **Inputs relating to the option** | | | | | |
| Enter the present value of the cost of developing the resource option = | | | $172,000,000 | (in currency) | NI-43-101 estimate |
| Enter when the rights to resource will be relinquished = | | 7 | (in years) | | Development stage |
| **General Inputs** | | | | | |
| Enter the riskless rate that corresponds to the option lifetime = | | | 7.00% | (in %) | 30 year bond rate plus 4.2% inflation |

| | | | | | |
|---|---|---|---|---|---|
| VALUING A LONG TERM OPTION/WARRANT | | | | | |
| Stock Price= | $405,154,155 | T.Bond rate= | | 7.00% | Equal to riskless rate |
| Strike Price= | $172,000,000 | Variance= | | 0.25 | Standard deviation squared |
| Expiration (in years) = | 7 | Annualized dividend yield= | | 0.00% | No dividends |
| d1 = | 1.679502634 | | | | |
| N(d1) = | 0.953472937 | | | | |
| d2 = | 0.356626978 | | | | |
| N(d2) = | 0.639314461 | | | | |
| **Value of the natural resource option =** | | $318,937,845 | | | |
| | ROXGOLD | 100% | | | |
| | Net value to shareholders | $318,937,845 | | | |

Based on that analysis, I concluded Fortuna had agreed to pay over $1 billion for a mine that had a value of about $319 million. I immediately sold my Fortuna shares and enjoyed a small profit. Based on the value of Roxgold and assuming the shares of Fortuna pre-acquisition were reasonably valued at market, I estimated the resulting value of a Fortuna share was about $4.50 a share post-acquisition of Roxgold. I was not surprised when the market for Fortuna shares sold off over the ensuing weeks and traded down below $5.00 a share by year end 2021.

The key officers of Fortuna not only own Fortuna shares but also enjoy cash settled RSU's and stock options. It is a reasonable inference that they believed the Roxgold acquisition would produce benefits for Fortuna and its shareholders, but it is hard to reconcile that inference with their decision to carry out and promote an acquisition that was likely to (and in fact did) damage the value of Fortuna shares. It would not be the first time in corporate history that management of a mining company gambled on an acquisition for no other reason than to become the leaders of a larger organization, particularly among gold miners who are stereotypically bullish on long term gold prices. Nonetheless, and without impugning the integrity of Fortuna managers or their motives, the role of Scotia Inc. in serving up a favorable "fairness opinion" for a transaction that is demonstrably unfair to the minority shareholders of both Fortuna and those who became such shareholders through the Arrangement promoted to them by information devoid of a formal valuation points to the weakness in the Arrangement process and the willingness of Courts to defer to the judgment of so-called "independent experts" whose idea of "fairness" does not include "fair value".

The top three officers of Fortuna had suffered declining compensation for the three years up to and including 2020 according to disclosure in the Circular. It is likely their compensation will benefit from being stewards of a larger corporation, but the evidence suggests shareholders were not well-served by the acquisition.

The following summarizes all compensation paid or payable to NEOs during the fiscal years ended December 31, 2020, 2019 and 2018:

| Name and Principal Position | Fiscal Year | Salary | Share-based Awards (1) | Option-based Awards (2) | Non-Equity Annual Incentive Plan Compensation | | All Other Compensation (4) | Total Compensation |
|---|---|---|---|---|---|---|---|---|
| | | | | | Annual Incentive Plans(3) | Long-term Incentive Plans | | |
| Jorge Ganoza Durant(5) | 2020 | $618,000 | $1,421,600 | N/A | $440,016 | Nil | $35,699 | $2,515,315 |
| CEO | 2019 | $618,000 | $1,421,600 | N/A | $346,080 | Nil | $260,115 | $2,645,795 |
| | 2018 | $600,000 | $3,134,000 | $456,000 | $438,000 | Nil | $899,843 | $5,527,843 |
| Luis Ganoza Durant | 2020 | $401,700 | $567,110 | N/A | $272,051 | Nil | $79,385 | $1,320,246 |
| CFO | 2019 | $401,700 | $567,110 | N/A | $214,407 | Nil | $143,584 | $1,326,801 |
| | 2018 | $390,000 | $2,032,200 | $234,800 | $262,763 | Nil | $251,859 | $3,171,622 |
| Manuel Ruiz-Conejo | 2020 | $360,500 | $425,200 | N/A | $184,937 | Nil | $18,063 | $988,700 |
| VP, Operations | 2019 | $360,500 | $425,200 | N/A | $135,188 | Nil | $114,488 | $1,035,376 |
| | 2018 | $350,000 | $615,200 | $231,396 | $202,125 | Nil | $240,549 | $1,639,270 |
| Jose Pacora | 2020 | $283,250 | $424,850 | N/A | $511,408 | Nil | $9,900 | $1,229,408 |
| VP, Project | 2019 | $283,250 | $424,850 | N/A | $250,676 | Nil | $74,798 | $1,033,574 |
| Development | 2018 | $275,000 | $246,000 | $164,000 | $272,250 | Nil | $27,609 | $984,859 |
| David Volkert(6) | 2020 | $288,174 | $388,346 | N/A | $134,578 | Nil | $22,003 | $833,101 |
| VP, Exploration | 2019 | $291,305 | $392,565 | N/A | $104,870 | Nil | $22,184 | $810,923 |
| | 2018 | $289,350 | $199,073 | $132,715 | $139,250 | Nil | $26,063 | $786,450 |

## RECOMMENDATION

OSC NI-43101 should include in section 22 on Project Economic Analysis the requirement to disclose the value of the reserves using the modified Black-Scholes methodology as well as the current DCF and NPV values. Where there are wide differences in valuation surfaced by these approaches, issuers should be required to explain to the best of their ability what gave rise to

the differences. Typically, I expect it will be commodity price forecasts used in the DCF and NPV analyses that have a low probability of coming to fruition.

Michael Blair