James Hershaw
CFA MBA BSC
Managing Director
WATT Capital
james.hershaw@wattcapital.com

CSA Consultation Paper 43-401

July 13, 2022

To:

British Columbia Securities Commission
Alberta Securities Commission
Financial and Consumer Affairs Authority of Saskatchewan
Manitoba Securities Commission
Ontario Securities Commission
Autorité des marchés financiers
Financial and Consumer Services Commission, New Brunswick
Superintendent of Securities, Department of Justice and Public Safety, Prince Edward Island
Nova Scotia Securities Commission
Office of the Superintendent of Securities, Service NL
Northwest Territories Office of the Superintendent of Securities
Office of the Yukon Superintendent of Securities
Nunavut Securities Office

Chris Collins Chief Mining Advisor,
Corporate Finance
British Columbia Securities Commission
P.O. Box 10142, Pacific Centre
701 West Georgia Street Vancouver,
British Columbia V7Y 1L2
Fax: 604-899-6616
ccollins@bcsc.bc.ca

The Secretary Ontario Securities Commission
20 Queen Street West, 22nd Floor
Toronto, Ontario M5H 3S8
Fax: 416-593-2318
comments@osc.gov.on.ca

Me Philippe Lebel Corporate Secretary and Executive Director,
Legal Affairs Autorité des marchés financiers
Place de la Cité, tour Cominar
2460, boulevard Laurier, bureau 400
Québec (Québec) G1V 5C1
Fax: 514-864-8381
consultation-en-cours@lautorite.qc.ca

Introduction:

The CSA's goal *"to provide investors with more relevant and improved disclosure, and to continue to foster fair and efficient capital markets for mining issuers"* is appropriate. Capital formation is part of the CSA's mandate so they must also encourage risk capital to help ensure that Canada prioritizes the optimum development of economic mineral resources based on efficient fair market principles. This CSA 43-101 consultation should be used as an important catalyst to identify ways to expand the Canadian capacity and expertise of the Canadian mineral resource valuation business at every stage of development. Valuing mineral properties is a technically complicated analysis based on future assumptions where the information databases are often quite limited. Property valuation is the fundamental economic principle behind production decisions and capital market valuations.

These comments are prepared from the perspective of investment professional, engineer and analyst who has managed a TSXV mineral development company that has had to commission and assemble NI 43-101 engineering reports for projects from a regulatory perspective. Registrant roles in portfolio management and due diligence compliance have also provided perspectives on the buy side where NI 43-101 reports are a fundamental part of determining appropriate valuations related to financing and potential equity valuation.

Additional experience with the Canadian oil and gas sector also highlights a comparative resource valuation responsibility of the NI 51-101 reports. The related engineering reports are key to putting definitive valuations on oil and gas properties for acquisition and sale transactions in addition to obtaining operating and project loans secured against oil and gas wells.

The primary incentive to provide these comments is to ensure that Canada has world class geological analysis and engineering expertise that is supported by an appropriate technology infrastructure and sufficient human resources to meet the forthcoming Canadian resource development challenges.

It is insufficient to have stand alone geological studies that have limited bearing on identifying, developing and profitably producing a wide range of economic natural resource minerals. Hard rock minerals have a diverse range of difficult to achieve economic parameters as highlighted by the fact there are only about 200 producing mines compared to over 200,000 active oil and gas wells in Canada. Each one of these producing entities ultimately provides an operating analogue model for determining future operating models and ultimately the value of Canada's resource potential. Preproduction mineral exploration targets are numerous, but the probability of successful development is low. NI 43-101 reports provide necessary steps on assessing potential production. Expected value analysis of mineral properties at every stage of development based on technical and market principles should be the primary objective for NI 43-101 reports.

An important goal of the CSA is Capital Formation. The CSA (in conjunction with other national organizations and government bodies) should benchmark the number, quality, and scope of NI 43-101 reports (and underlying geological data) in public databases that can be easily accessed and used as a fundamental building infrastructure to assess and unlock the economic potential of Canadian mineral resources. The economic value identified in NI 43-101 reports may be more fundamental measure of resource valuation than a simple tally of all the public mineral companies market capitalization which may have valuation variability that is unrelated to inherent mineral assets.

The Canadian government has recently requested consultation comments on how to achieve Canada's Critical Mineral Industrial Strategy. The CSA should be providing input on how an enhanced NI 43-101 reporting systems and an underlying goal of providing valuation estimates at every stage of the mineral development cycle can be part of the infrastructure to achieve this industrial strategy.

NI 43-101 CSA Consultation Key Recommendations

1. **NI 43-101 Reports should have a primary goal of providing a property valuation estimate based on an Expected Value model at every stage of the Mineral Property Development cycle.** Valuation models should used data including:

    a. CIM guidelines on Resource and Reserve determination. (CIM should update models)
    b. Comparable claim values
    c. Book value of expenditures to date
    d. Metrics of metres of drill core
    e. Comparable geological and operating mine analogues
    f. Preliminary Economic Analysis Net Present Value analysis
    g. Comparable current value of Resources in the ground
    h. Probability estimates of a range of scenarios including % likelihood of zero valuation.
    i. Auditor review of booked mineral property values based on current IFRS mineral property valuation methods
    j. Current security analysts' valuation methods for "rock in the ground"
    k. Any other fair market valuation model that can be justified by a reasonable peer group review.

2. **CSA should consider leading the development of a SEDAR regulated Technical Reports Database subset with search and summary metric analysis that provides an easy access and maintains usable legacy data with time horizons of at least 50 years.** Ownership records, verification mandates and the valuation of the technical reports will ensure that legacy data is additive and can be used efficiently in future commodity development cycles when mineral properties may have different ownership circumstances and economic parameters. Summary metrics on capital costs and operating costs from various components of NI 43-101 reports can become a useful public reference tool for future NI 43-101 reports and for investors

3. **CSA should consider not allowing Operating Companies an exemption from completing independently review NI 43-101 reports.** Incorporating detailed resource and reserve valuation models than is being confirmed by current operational data will benefit all mineral development companies in Canada. The more detailed analysis of operating mines will provide analogue data in areas like grade and reserves variability and operating and capital costs to enhance comparative models for PEA's for other earlier stage properties. .

4. **CSA should consider leading the development of a Qualified Individuals and Qualified Firms Database (similar to those for Registrants) that will have the mandate to expand the definition of Individuals and Firms that can prepare Technical Reports.** The current definition for Qualified Persons is too narrow and it is assumed that there may not be enough people to complete these sophisticated technical reports relative to the economic opportunities for natural resources development. These Qualified Individual and Firms databases should not promote additional compliance liability that may restrict innovative valuation models and participants. These cumulative NI 43-101 databases should have a goal to ensure that efficient capital formation is a primary goal. Qualified Individual registration should not have any filing fees or expensive compliance procedures that may deter registration.

5. **CSA should consider expanding the types of Technical Reports that provide a basis for valuation of early-stage public companies.** The precedent has been set with the NI 43-101 reports and NI 51-101 reports for Mineral and Oil and Gas developments. Stand alone downstream processing, manufacturing and technology developments could also benefit from independent technical reports where most of the value of the SEDAR filing company is based on an expected future business model that often requires technical innovation. Many of the battery metal end products are obtained by creating high quality metal based chemical compounds which require independent process engineering technical analysis. A case could be made the Technical Reports on software code by independent Qualified Software experts would be a useful step in advancing Capital Formation for Canada's technology sector.

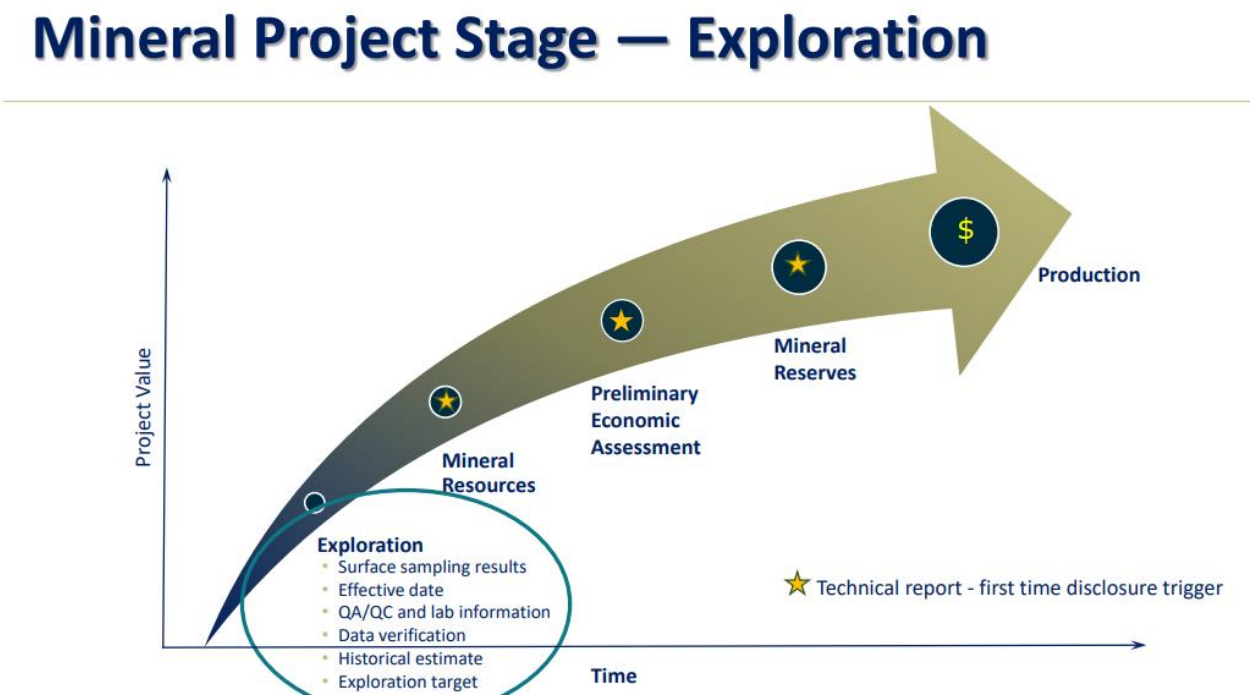
6. **CSA should consider its role in Canada's Critical Mineral Industrial Strategy.** Government institutions often default to narrow legislative mandates and insist that strategic initiatives are outside its jurisdiction**.** The reality is these institutions have an important role and are often better funded, with mandated access to data and resources that is not available to private companies and associations. The CSA has significant influence over Capital Formation stakeholders such as exchanges and investment dealers that have important mineral development expertise. The evolution of NI 43-101 reports should consider how it helps to achieve Canada's Critical Mineral Industrial strategies.

7. **Regulated NI 43-101 reports should be part of eligible flow through share expenditures and eligible for the recently introduced 30% Critical Mineral Tax Credit.** Additional funding sources for the preparation of earlier stage NI 43-101 reports will improve quality, credibility and business economics for firms involved with technical report preparation. More funding will expand the quantity and quality of NI 43-101 reports which will leading to greater capital formation opportunities.

Consultation Questions:

A. **Improvement and Modernization**

1. Improvements in Valuation of Pre-Mineral Resource Stage Projects



Key recommendations are the Exploration Stage:

- Additional mineral property valuation information is required in pre-mineral resource disclosure.
- Property claim valuations should include metrics on historic expenditures including value of engineering studies to date; geophysical studies, and metres of exploration drilling.
- NI 43-101 Reports should be completed for every stage of mineral property development for any SEDAR filing public company.
- Auditors' assessments of book value of property expenditures.
- Market values of comparable claims.
- Companies should be encouraged to develop expected value models estimating the type of increase or decrease in pre-resource property values that might be achieved with required work programs. Probability estimates would be part of the disclosure information.
- Expected Value estimates could be structured around the TSX Property Requirement programs for various stages TSX-V companies. For example for a TSX-V Tier 2 Issuer, it would be reasonable for the Issuer in conjunction with technical experts to provide forecast of the range of outcomes for a Work Program of $200,000. For example there might be a 45% chance that the $200,000

will go to zero, 45% chance that an additional $200,000 book value is maintained, a 9% chance the claims value is increased to $1,000,000 and a bluesky 1% chance of $25,000,000. Overall the expected value of the $200,000 Work Program is $430,000. The assessment of Expected Values of Work Programs would evolve based on better data with incorporation of global geologic model databases that would examine possible size and probability of potential ore deposit models. This type of Expected Value analysis can be applied at all stage of development as there are examples of properties that even with substantial work have a high probability of a zero value case.

Property Requirements

TSX-V – TIER 2	TSX – EXPLORATION
Minimum 50% interest in a qualifying property ($100,000 of exploration expenditures on the qualifying property in the past 3 years) Work program: $200,000	Minimum 50% interest in an advanced property (mineralization three dimensions and at economically interesting grades) Work program: $750,000
TSX-V – TIER 1	**TSX – PRODUCER**
Minimum 50% interest in a Tier 1 property (property with substantial geological merit) Work program: $500,000	Three years of proven and probable reserves Commercial production decision made or in commercial production

2. Alternative Presentation Formats

The presentation format of a complete NI 43-101 Reports should have minimum requirements as outlined in the regulations. However, there should be no constraints of the inclusion of additional information and creativity of the technical, economic, and financial analysts' presentation. NI 43-101 Reports should be a standalone document that is a valid analysis of the mineral property as of a certain date. Financial reports and legal disclosures which are quickly stale dated. Mineral property data analysis has a much longer analysis and reporting cycle based on the time and effort it takes to develop economic mineral resources. Fulsome mineral property disclosure should be backed up by reasonable technical estimates that reference all aspects of exploration analysis and potential economic viability of the project. Valuation estimates would require an expected probability assessment that includes estimates on the probability of a zero-valuation case. Expected Value analysis combined with detailed NI 43-101 reports should apply at all stages of the mineral development.

3. Country Disclosure and Regulatory Alignment

Canada should have a strong emphasis of common regulatory and disclosure alignment with free trade partner US. Although there are other strong mining nations such as Australia, it would be more efficient to align with Canada's largest trading partner. In addition, new Critical Mineral strategies have identified that complete supply chain analysis in high volume areas such as EV battery production means that integrated downstream processing into final battery chemical

compounds with long term contracts may be the more appropriate mineral development strategies. The traditional approach of producing primary metals and forecasting spot market metal prices may be too simple for a robust NI 43-101 that involve complex critical battery metals speciality chemical compound supply chains.

4. Reporting Timelines

43-101 Technical reports need to be a fundamental and robust valuation document for public mineral development companies. Reporting timelines less that 45 days are not useful if the technical analysis has not been completed. Analysis on how interim press releases on successful drilling results can be disclosed quickly should be reviewed. A potential disclosure model of management always assessing and disclosing the Expected Value of properties requires a consistent transparent valuation model.

It may be reasonable for management to make a news release guidance quote such as *" Subject to complete technical analysis which will be incorporated into an updated NI 43-101, we believe the Expected Value of the Bolt Lithium Property has increased by 10% to 30% based on preliminary visual results and select grade analysis of the recent drilling program which was completed on June 30, 2022. ".*

Clearly if management makes misleading statements that do not have some basis of technical analysis the track record will become obvious. Reasonable estimates of Expected Value will provide guidance. Guidance forecasts of earning forecast are common practice in the capital markets. There need to be a similar guidance process for current property valuation estimates when future cash flow may never occur or be many years in the future. Volatility analysis is a common model for derivative valuation. Expected Value analysis is often used in more binary oil and gas drilling well analysis where each well often provides more definitive conclusions compared to hard rock core samples. Similar expected value principles could be applied to mineral property development based on each stage of drilling programs.

5. Remote Survey Technology

Using new technology such as drones or any other innovation to optimize exploration costs where appropriate should be allowed. The goal should not be to minimize costs or shorten reporting times. The goal should be to create better technical data that will lead to better capital allocation decisions and higher expected values and investor returns.

6. Data Verification Procedures

The theme of the CSA questions on Data Verification include:

- *"CSA staff see inadequate data verification disclosure at every project stage, from early-stage explorations properties to feasibility studies."*

- *"Qualified persons must state their professional opinion on those processes, explain the steps they took to verify the integrity of the date, and their professional opinion whether the data suits the purpose of the technical report."*
- *"Data verification of the Form addresses the core principle of NI 43-101and is the primary function of qualified persons."*

The conclusion one takes from these statements is that the CSA seems to imply that Qualified Person(s) are doing an inadequate job in the areas of data verification. This may well be the case, however, there does not seem to be straightforward solutions to ensuring that this technical review capacity is achieved.

It is easy to draw comparisons to the role of accountants doing annual audits of financial statement to verify accuracy. The reality is this financial audit and tax filing systems has an order of magnitude more capacity in the form of qualified accountants working for large, regulated accounting firms with a regulated annual reporting cycle. It is also a fair statement that auditing financial transactions and account balances is a more systematic process that has been automated by leading global software.

The reality is that hard rock drill core data analysis and subsequent data takes many years and often decades to assemble and there is not any compliance type mandate to maintain databases and have regulatory signoff of verified data. The only common database where NI 43-101 reports are filed is SEDAR in the final PDF report format. Even this basic filing step does not have any independent review and signoff in a manner like Annual financial reports.

It is within this context the CSA should take more responsibility for better defining the existing state of the Qualified Persons (and related Qualified Firms) capacity to do the type of multifaceted work for important NI 43-101 reports. The following chart show the number of annual Canadian Technical NI 43-101 reports filed annually based on CSA analysis. From 2005 to 2020 there were 14000 reports filed. The CSA analysis should be more fulsome analysis of to create a data base of all the Qualified Persons, Qualified Firms, Area of Expertise and estimated cost to complete these reports. At the very least this would be a measure of the capacity to complete NI 43-101 reports in Canada. It would also provide context where there are significant limitations and potential problems to ensure the future success of the Canadian mineral development industry. It may be that due to the volatile nature of the commodity business that even a mining country like Canada has an insufficient number of Qualified Persons and Firms to complete this complex technical assessment work.

The CSA notes many deficiencies through mining review including:

"Qualified persons failing to properly assess their independence, competence, expertise or relevant experience related to a commodity, type of deposit or items for which they take responsibility in technical reports"

It would be useful context if the CSA provided more detail on the above statement and other deficiency issues raised in the consultation paper. For example, is this a problem with the majority of the 14000 reports filed in the last 15 years? Or is it more associated with long dated legacy data and deposits that no longer have the review support by the original authors and sponsoring firms.

Legacy data is very long dated in the mineral exploration sector but is still valid as basic methodologies have not had major technology changes.

The goal establishing mineral exploration property database maintenance systems that can be sustained for 50 years is the reality. The ongoing responsibility for verified legacy data may be more relevant than creating an expectation around Qualified Persons expertise and data verification capabilities for projects that often exceed the span of an individual's productive career years.

CSA, NRCAN and Provincial Mining Ministries need to take more responsibility for mineral property data integrity, verification, and storage. Provincial claims assessment databases already exist, but these are unstructured filings that may not provide the complete assessment of a fully reviewed NI 43-101 report.

A SEDAR database update is an ongoing CSA project. There have not been any recent progress reports on its development. It would be useful to see how SEDAR has considered easy access and analysis and verification of NI 43-101 reports in the future update of SEDAR systems.

7. Disclosure of Data Verification Procedures

The CSA should provide examples of the best disclosure of Data Verification procedures. This may be a complex task given the cumulative nature of long dated mineral exploration data. The solutions to provide better verification standards may require innovative new technologies that are not be easily adopted. Legacy data is an obvious example of a difficult to issue to manage. Private ownership of legacy data also creates access problems when registered owners cannot be accessed due to a variety of reasons.

8. Personal Inspection Standard for Data Verification

The CSA highlights the importance of personal inspection as part of the data verification process. In an era when live global streaming of video is essentially free, it may be less relevant for "Qualified Persons" to make personal inspections. There may be merit for field geologist manually review core results but interpreting core analysis is much more complex that visual inspection. Advances in direct digital data transfer of the results to appropriate cloud-based databases may provide better productivity gains and data integrity. The CSA should ensure direct feedback on this issue from practicing Qualified Persons and Firms that are using the latest technologies to collect and store drill results are applied.

9. Historical Estimate Disclosure Requirements

The mineral exploration sector is one of the few areas where 50 year old drill results may still be relevant in making future capital allocation decisions. The issue with historic information disclosure is the data format and storage has changed considerably in the last 50 years. It is unrealistic for individuals and small private sector firms to be the gatekeepers for cumulative mineral deposit data. Marginal work programs completed in 2022 will be considered historic in 2050 but may still be relevant to advance a new lithium deposit. Cautionary statements are appropriate but Expected Value model with estimates on probability of variance errors may be a practical way to convey information to risk oriented investors. Meaningful CSA recommendation to involve all stakeholders to develop appropriate databases to preserve the integrity of historic data is an important goal.

The oil and gas industry has experience with larger databases of producing oil and gas assets. Alberta requires all production and well log data be filed within the public domain. Oil and gas engineering firms readily use producing analogue well models based on existing production to complete NI 51-101 engineering reports that include definitive property valuation estimates.

To ensure a more robust database all mineral deposits there must be mandatory reporting and filing of historic data including within producing mining companies. No exemptions should be allowed. Mandatory compiling and storing mineral deposit data on government sponsored databases for any company accessing any type of government support such as tax credits for exploration or development of necessary infrastructure like roads and power.

Better access to producing company data may also ensure better development of the overall capacity of independent Qualified Persons and Firms to complete high quality NI 43-101 reports. The governments and regulatory bodies (including CSA) will have the responsibility to build and maintain these state of the art databases.

10. Disclosure Requirements for Historic Data

Disclosure on Historic Data should be complete and balanced so that investors can appreciate both downside and upside potential of potential errors. Historic data must be recognized as an important tool in the difficult and expensive screening process to identify potential economic mineral deposits.

D. Preliminary Economic Assessments

Preliminary Economic Assessments in NI 43-101 reports are often prepared fairly early in the mineral development cycle to provide capital allocation valuation targets that are important to determine blue-sky valuations for early-stage public companies. PEA's are an attempt to bridge conflicting need to attract high risk drilling capital with the reality that early stage results may ultimately prove to be of limited value. The unique nature of mineral drilling programs is the results reveal potential mineral grades and widths in a quick binary way. This may have a short-term impact on share price trading values and volumes but ultimately it is later stage feasibility studies that affirm the sustainable valuation attributed to mineral reserves and ultimately operating mines. The necessary exploration and development steps often take 10 years or longer so it must be understood that mineral property valuation variability will be much higher than other development projects such as oil and gas wells, greenfield real estate properties, or downstream manufacturing facilities. Mineral exploration has risk and variability profiles that may be similar to start-up technology ventures. Providing investors with benchmark valuation variability is a concept that is understood in other parts of the capital markets. The mineral development industry should strive to build expected value and variability models based on reasonable technical estimates by professionals. Investors should be provided guidance on how to interpret these mineral property valuation estimates.

In the consultation paper *"CSA staff's view is that the broad range, undefined range of precision of a preliminary economic assessment also contributes to risk. The range of precision is incongruent with one of the core principles of NI 43-101 which is that investors should b able to confidently compare the disclosure between different projects by the same or different issuers."*

It would be useful if the CSA staff had suggestions on how better comparative measure between different project could be conveyed. The CSA is the gatekeeper of the NI 43-101 reports with staff having the ability to request resources to review and compare all reports. Expected Value, Risk Ranking, Dollars Expended to date on the project are all quantitative measure that could be implemented with proper analysis.

Objective qualitative and quantitative comparative measures of NI 43-101 reports would be part of the CSA's efficient capital formation policy objectives. Some type of scoring system could be incorporated into updated SEDAR database systems that have separate sections for all legacy NI 43-101 reports. The NPV estimated in a PEA that is early stage with limited expenditures to date has a higher variability than a PEA that is based on many years of exploration expenditures. Methods to measure the estimate accuracy of different PEA's would be a useful CSA policy objective.

11. Preliminary Economic Assessment Precision

It may be difficult to improve the precision of PEA given future variable outcomes. It is useful to ensure that all the work that goes into any mineral development program is cumulative and can be incorporated into improving the quality of the PEA scenario analysis. Comparative mineral exploration and engineering databases may provide a range of analogue models. Expected Value analysis with probability estimates on potential outcomes may be a way to convey risk. An early-stage PEA might suggest an NPV of $100 Million but it may have a probability of 50% that the project will never be advanced and ultimately may have zero value. Disclosure procedures around Expected Value analysis may be a useful exercise for the CSA to analyze.

12. Cautionary Statement Disclosures

Practical recommendations to increase risk assessment disclosure are supported. Boilerplate legal statement such as *"there is the potential to lose all your investment"* are not useful to help investors understand the current risk and expected value associated with specific mineral properties. There must be easy to obtain reference databases on items like cost estimation parameters or the dollar amount and type of engineering attributed to specific NI 43-101 reports. Access to infrastructure may be one of the more relevant factors in determining economic mineral production within 20 years. Since the CSA is the gatekeeper to these important NI 43-101 reference documents thoughtful analysis and technical Cautionary Statement recommendations by the CSA is requested.

13. Independence Requirement for PEA

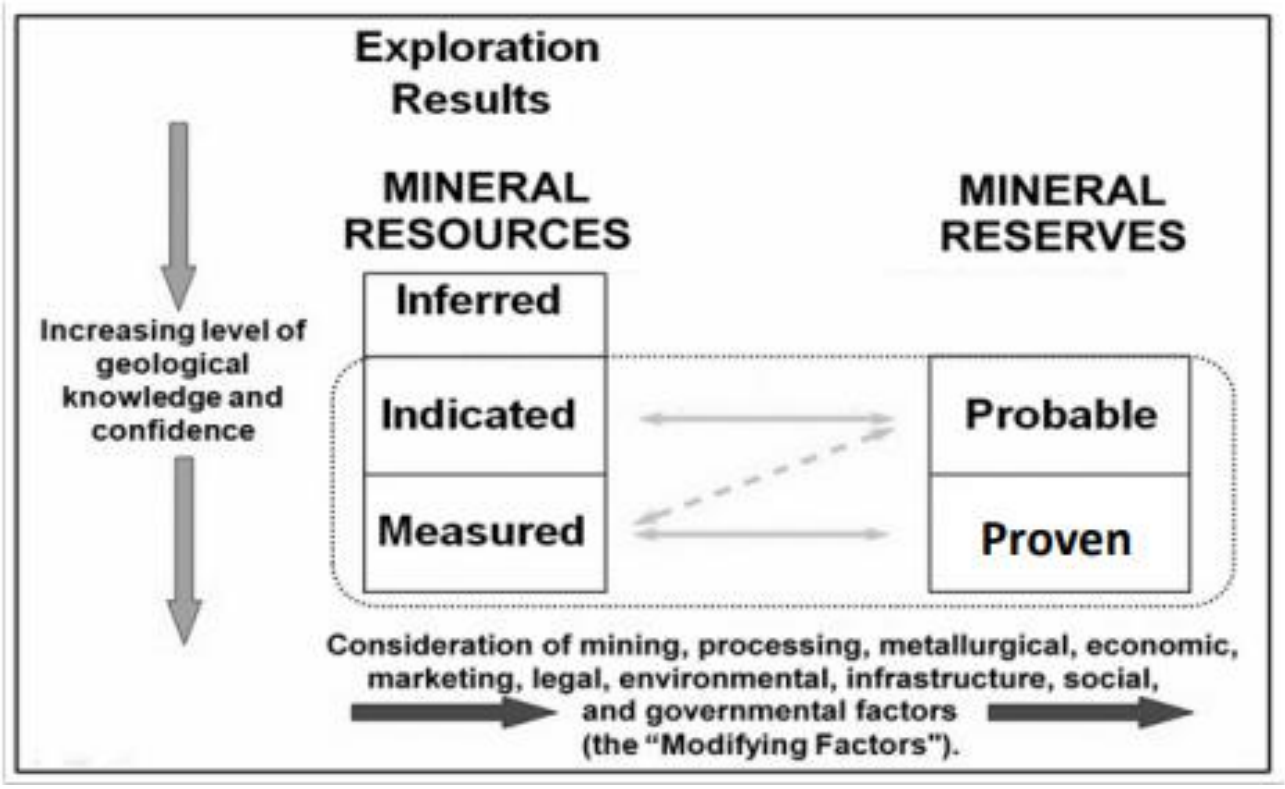
In general, independent review for all aspect of NI 43-101 development is supported as often as practical. The Issuer management and executive team should not be restricted from helping to develop PEA scenarios as this is a primary function in the mineral development business. This rationale is less about investor protection, but more about ensuring that issuers have the best decision models for efficient capital allocations. Risk is inherent, but significant tax credits are provided for mineral exploration programs in Canada, so any approaches that improve the capital allocation process is recommended. Independent review may lead to better decisions and provide oversight when more obvious errors in management judgement might be identified. Independent review also builds more robust databases and geological and engineering capabilities in Canada.

14. PEA Scenarios Based on Current Mineral Reserves

For reference the chart of the CIM Definition Standards of Mineral Resources and Mineral Reserves is included to illustrate the range of scenarios based on Increasing Level of (Geological Confidence) and the development of a complete set of project parameters (Modifying Factors) that are analyzed to present a complete economic project plan. It is

apparent that given all the potential variables that the range of potential scenarios vs the final recorded outcome that likely takes place at least 10 years in the future has considerable variability. Given this wide range of variability it does not make sense to prescribe specific disclosure rules related to estimates made with various PEAs at various stages of the information continuum that changes over time. While a single scenario may provide a simpler presentation, it is questionable if it provides any better information of the current value of the property as of the date of the report. The objective is to provide the best possible estimate of current expected value as of the report date. A range of possible future values is useful to allow the independent professionals and management team to develop the best possible explanation of a justifiable valuation that ultimately would be a reference point for a public company valuation and / or valuation for acquisitions and divestitures or joint venture partnership deemed value assessment.

All of these items or *"fair market value"* assessments are important capital market valuation references for the full range of individual, institution and corporate investors. All the individual Mineral Resources and Reserves blocks might be assigned individual valuations with expected probability to provide an overall valuation model. What is missing in the CIM model for mineral reserves that is available in the oil and gas sector is a Proven Producing category of Reserves that has the highest level of confidence as reservoir models on production can be directly measured. This is much more difficult to achieve with mineral producers both due to the considerable lag between drilling and production but also because there seems to less onus on existing mineral producers to produce independent mineral reserves reports that can quantify and compare all the original Modifying Factors.



15. By Product PEA Assessments

There should not be any prohibition of potential scenarios developed for by product cashflows. The increase in geological confidence based on available data is a continuing development analysis. The assumptions used in any PEA should be well explained with quantitative probabilities of success assigned to these assumptions. For example, there may be low grade by product that would not be economic for primary production, however if there are analogue models that suggest that a reasonable likelihood of some type of by-product associated with an economic concentrate it makes sense that some type of value be attributed to this by product. It would make sense that a separate valuation block be developed for the by product NPV so that it can be easily subtracted or added to investors assessment of the total property value.

E. Qualified Person Definition

CSA staff have noted there has been an increase in practitioners with less that 5 years of experience as professional engineers or geoscientist acting as qualified persons in technical reporting. CSA indicates that it is informing issuers that the qualified person does not meet the requirements of NI 43-101. It is apparent that the CSA needs to use its gatekeeper responsibilities to provide better background data for these statements. For example, based on its review of NI 43-101 reports, how many Qualified Persons and associated Qualified Firm completed the 500 to 1500 technical reports that have been filed on an annual basis since 2005. The NI 43-101 is a specialized report that has a small annual volume compared with the activity of accountants preparing financials and / or tax filings that would number is the millions of annual filings.

Data from CPA states there are 210,000 accountants in Canada. Engineers Canada states there are 170,000 practicing engineers. Geoscientist Canada states there are 20,000 geoscientists. It is a reasonable assumption that most qualified accountants have a transferable skill between different types of accounting projects. As similar assumption is not likely to be made for the number of engineers and geoscientists preparing NI 43-101 reports. It is apparent that there is a very wide range of technical analysis that would go into increasing the Geological Confidence and Modifying Factors that are necessary to complete reports on a wide range of geology, mining methods and mineral processing models. It is the author's assumption that the number of people that meet Qualified Person standards and regularly prepare NI 43-101 reports is a small number. This would be confirmed by the actual costs to complete the annual NI 43-101 reports that would be the basis for the Qualified Persons consulting fees and salaries. T

The number of Qualified Persons that are employed in Canada by large established engineering firms that regularly prepare NI 43-101 reports is likely may be smaller than expected. The cyclical nature of mineral development with long lead times must also compete with much higher volume career opportunities for engineers in real estate, infrastructure, and technology. Many engineers and geoscientists end up in management and careers unrelated to the geosciences. This purpose of highlighting a quantitative discussion on the number of practicing Qualified Persons is to put some responsibility on the CSA to recommend solutions based on actual data.

16. Definition on Qualified Person

The definition of qualified person as an individual to be an engineer with a university degree in an area of geoscience or engineering related to mineral exploration or mining is clear. The question for the CSA is what the demographics are for skill sets and number of Qualified Persons currently preparing NI 43-101 reports in Canada. Not all engineers and geoscientists choose to be part of the regulatory association needed for a practicing certification. If there is a skills gap there must also be a commensurate supporting business model that can sustain professional salaries and career opportunities in the business of completing NI 43-101 reports. This type of information would then provide a basis to make meaning recommendations on both the types of individuals and perhaps more important registered firms that should be permitted to complete NI 43-101 reports. There are regulatory liabilities associated with preparing NI 43-101 reports that may also need to be reviewed to ensure that a viable model for preparing fulsome technical reports that contribute to mineral property valuation and capital formation. The CSA interacts with Registrant Firms for securities matters and Accounting Firms for submission of audited financial reports. In both these cases it is the Firm rather that the Individual that takes responsibility for securities matters and financial statement preparation respectively.

There may be a need to have some type of Qualified Person / Firm CSA managed registered database for submission of NI 43-101 reports. The intent of this type of activity is not to increase compliance costs to complete NI 43-101 reports but rather to allow a broader range of people and firms to participate in producing high quality Technical reports. This is an important topic on Qualified Person labour capacity if Canada is to remain a global leader in the mineral production sector.

17. Broader Qualified Person / Firm Definitions

As a continuation of the comments made in 16. there needs to be a review of the qualified person / firm definition. It may make sense that professionals with any type of analytical business qualification such as accountants and analysts that have are associated with professional organizations such as CPA or CFA be permitted to work on NI 43-101 reports as long as they have some type of contractual association with a Qualified Firm that has appropriate geoscience expertise.

A case could be made that software and data verification management expertise may actually be a more relevant expertise as most mineral resource / reserve modelling depends on associated software packages. It is also useful to examine the downstream process aspects of creating a viable economic mineral product. The benchmark valuation of various mineral compounds (ie Lithium hydroxide or carbonate) may actually require significant process and manufacturing engineering skills that are not associate with traditional metals exploration and development models.

It is recommended that the starting point for this type on expansion of qualification would start with the creation on independent NI 43-101 databases and associated registered NI 43-101 qualified persons and firms be developed as a subset of existing CSA SEDAR databases and Registrant records. These initiatives should be funded and led by the CSA as part of its efficient Capital Formation objectives. This should not be implemented as an additional compliance burden, but as a strategy to support of more robust and economically viable system to produce high quality Technical Reports that have a primary objective of property valuation based on technical data. This type of initiative would fit with existing Registrant Firm and submission of certified financials in the existing SEDAR system.

18. Qualified Person Independence

The CSA comment of *"The gatekeeping role of the qualified person is essential for the protection of the investing public"* seems to be ambitious given the potential scenarios are highly variable, capital intensive with long lead times for mineral development projects. It is important that Qualified Person are independent to ensure there is more reasonable fairness perspective on the results and information provided by NI 43-101 technical reports. Given the high probability of eventual zero value attribution of many exploration projects, independence will help to provide balance in capital allocation to make a more efficient market. This is not just an investor protection issue but also to contribute to better overall industry success rates. There is a limited pool of annual flow through share expenditures (with commensurate tax credits) that should be allocated based on the best available information. This is not a liability issue but more of an efficient markets goal.

Some of the independence principles of security analysts research reports may apply to NI 43-101 reports. The reality is the mineral development companies are primarily based on property valuations as this drive both primary and secondary securities issues. Significant resources are spent on the financial reporting, trading infrastructure and legal processes for mineral development companies. A higher allocation of resources directed towards technical reports that have a direct valuation goal may better contribute to the CSA goals of Capital Formation, Fair and Efficient Markets and Investor Protection.

The CSA must take a greater NI 43-101 gatekeeper responsibility to ensure all these objectives are achieved. This should also include a CSA signoff review of NI 43-101 reports that are permitted to be submitted to SEDAR databases. If the CSA needs more resources to assume a timely gatekeeper responsibility for NI 43-101 reports then make the case to various levels of government and not just rely on capital market fees.

The emphasis on Qualified Persons with a geoscience background as the primary gatekeeper may be too limited in scope. There needs to be a way to expand this responsibility to include a much broader range of professionals, firms and regulators that will all contribute to a more fulsome 43-101 technical property reports and cumulative database of technical information.

19. Directors and Officers Role in Authoring NI 43-101 Reports

Directors and Officers of Issuer do have a conflict of interest when preparing related NI 43-101 technical reports. However, it is likely that these people may have some of the highest levels of expertise in particular properties and project economics. It makes sense as they have chosen to be involve with these higher risk projects. These Directors and Officer should not be disqualified from authoring these reports.

There should be an Independent Review by an external Qualified Person of the final recommendations and expected property value conclusions that are part of required public disclosures. Expected property valuations should apply to all stages of a mineral property development from grass roots exploration to producing properties. There should not be forced conservative assumptions based on liability concerns but pragmatic expected value statements at every stage of the mineral property life cycle. Investor risk disclosures on high variability including the probability estimates of a zero-value outcome base on exploration success statistics should be part of the analysis.

Directors and Officers should have the opportunity to develop best or "bonanza" case scenarios based on technical facts but that should also be balanced with the probability of zero valuation scenarios. Investors can then make capital allocation decisions based on this range of scenarios.

F. Current Personal Inspections

The CSA statement that a current personal inspection is a *"foundational role"* of the qualified person's role as gatekeeper for the investing public may be overstated. In extreme cases where there is fraudulent core or claims this may be the case, however it is expected that by the time a mineral property reaches the stage of 43-101 SEDAR filings stage; cumulative exploration data review and due diligence will have minimized fraud situations. There should be latitude on what defines personal inspections based on the specific project circumstances. In the age of low-cost satellite imaging and live stream video it may be appropriate to update definition to realize that a personal visits by a Qualified Geologist may not be necessary and even a productive use of time. There should not be prescriptive regulations on required site visits. Pragmatic data verification methods should be based on the Qualified Person recommendations and particular aspects and information available for the project.

G. Exploration Information QA/QC Procedures

Analysis on drill core grades and lengths are one of the most fundamental aspects to determining resources. The CSA should ensure it has the input of multiple reserves evaluation and core grade testing firms to ensure that any new recommendations on QA/QC procedures are consistent with the current industry capabilities. The storage and access of legacy data is an important goal that the CSA as a representative of government institutions must consider. There must be a recognition that the level of accuracy is likely to be a function of expenditures to date. More data means more accuracy. Consideration on how this issue is managed relative to the stage of the

project is an important practical consideration. Early-stage projects have limitation on available funding for QA/QC procedures due to the high risk of a zero-value project.

H. Mineral Resource / Mineral Reserve Estimation – Reasonable Prospects for Eventual Economic Extraction

As outlined in various parts of this submission creating an Expected Value model for mineral properties at all stages of development is an important Capital Formation goal. The term *"Reasonable Prospects for Eventual Economic Extraction"* is a vague term. A more useful range of estimates would be to assign probabilities of a Zero Valuation Case, Base Case, and High Value Case based on available technical information and reasonable assessment by professionals. Mineral exploration development companies should choose to make these types of probability estimates with the release of each stage of exploration data.

Probability estimates may have rationale related to the stage of Resource and Reserves analysis and the underlying quality of these estimates based on the amount and quality of data. The cumulative expenditures of the exploration and drilling programs is a useful metric to help quantify accuracy of estimates.

Verification of legacy data is partly a function of the fragmented database systems that need a fundamental update with a goal of 50 year time horizons.

Complete technical risk disclosures must be based on the accuracy of the actual technical data and the estimates that are used. Boiler plate disclosures are not useful, however if hard geological data and capital and operating costs are limited then there is not likely an early stage alternative. The probabilistic Expected Value process must have a starting point and be cumulative with better estimates as more data becomes available

I. Environmental and Social Disclosures

NI 43-101 Reports should have the primary goal of identifying the Expected Value of mineral property. If there are major environmental or social issues that are expected to impair valuation these should be disclosed. There should not be unreasonable expenses allocated to outlining these issues unless they are material to the probability of the project advancing. The current standards for NI 43-101 disclosures are adequate.

J. Right of Indigenous People

NI 43-101 Reports should have the primary goal of identifying the Expected Value of mineral property. If there are major Rights of Indigenous Peoples issues that are expected to impair valuation these should be disclosed. There should not be unreasonable expenses allocated to outlining these issues unless they are material to the probability of the project advancing. The current standards for NI 43-101 disclosures are adequate.

K. Capital and Operating Costs, Economic Analysis

Capital and Operating Costs are a fundamental aspect of the best estimates for a Preliminary Economic Analysis of the mineral properties at every stage of development. As outlined in this submission, there needs to make the best possible estimate of property valuation based on available data. The CSA (along with other Government Entities) should provide sponsorship of making available benchmark metrics on all aspects of the Capital and Operating Costs. AACE International databases should be used. Similar Canadian cost engineering databases specific to mineral development projects in remote locations need to be maintained and updated based on actual projects and operating mines. NI 43-101 reports provide the regulatory basis to better develop these types of cost engineering databases. It would be useful for the CSA to engage the opinions of large Canadian engineering and project management firms that are involved with developing mines to develop state of the art Canadian databases. Analogue information in Canadian real estate and infrastructure projects would provide additional data.

The CSA needs to leverage its administration of NI 43-101 reports to advance the development of Canadian Capital and Operating Costs databases. This information should be easily accessible for mineral property development Issuers, Qualified Persons, Firms, and potential investors.

Economic analysis based on NPV analysis is a standard project evaluation model. NPV sensitivity analyses based on major variables such as discount rates, metal prices, and energy costs is standard practice that should be encouraged. The range of sensitivity valuations provides better assessment of the range of expected values. Variability of estimates will be useful for efficient Capital Formation goals and to provide better risk disclosure for investors.

Conclusions:

The CSA members and sponsoring governments have considerable resources to advance the quality of NI 43-101 technical reports. As discussed in this submission and by other stakeholders there are opportunities to ensure the Canada remains a global leader in Capital Formation for the mineral development sectors. NI 43-101 technical reports are an important aspect of this Capital Formation goal.