



Mining Disclosure Essentials:

NI 43-101 reporting fundamentals, industry best practices,
and useful guidance for TSX and TSXV issuers

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Presentation outline

NI 43-101 basics

- Qualified person
- Misconceptions

Disclosure: Exploration to production

- Exploration
- Mineral resource
- Preliminary economic assessment
- Mineral reserve
- Production

TMX - Technical disclosure best practices and tips for mining professionals and executives

- 2017 year in mining
- TMX disclosure policies
- Material information
- Timely disclosure rules
- Technical disclosure requirements
- Common disclosure issues
- Useful contacts
- News release exercise

Technical report basics

Technical report common disclosure pitfalls

- Item 1: Summary
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- Item 3: Reliance on other experts
- Item 12: Data verification
- Item 14: Mineral resource estimates
- Items 16 to 22 for an advanced property
- Item 20: Environmental studies, permitting and social or community impact
- Item 21: Capital and operating costs
- Item 22: Economic analysis
- Item 25: Interpretation and conclusions
- QP certificate

Key staff notices

Question and answer session

Key take away message





2018



NI 43-101 Basics

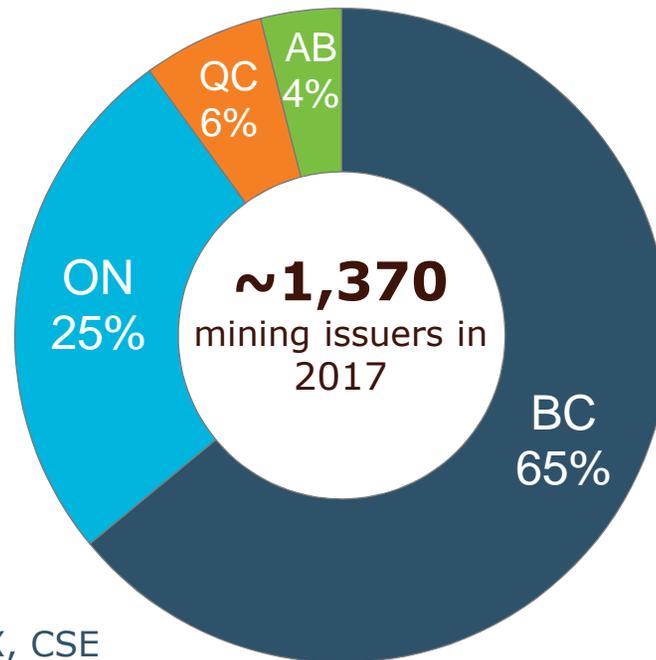
"Rule-makers cannot mandate ethical behaviour – nor can they prevent scandals. But they can create markets in which all those involved understand that the playing field is level"

Arthur Levitt, former Chairman of the SEC – January 2008

Canadian regulatory landscape for mining issuers



Provincial oversight of mining issuers

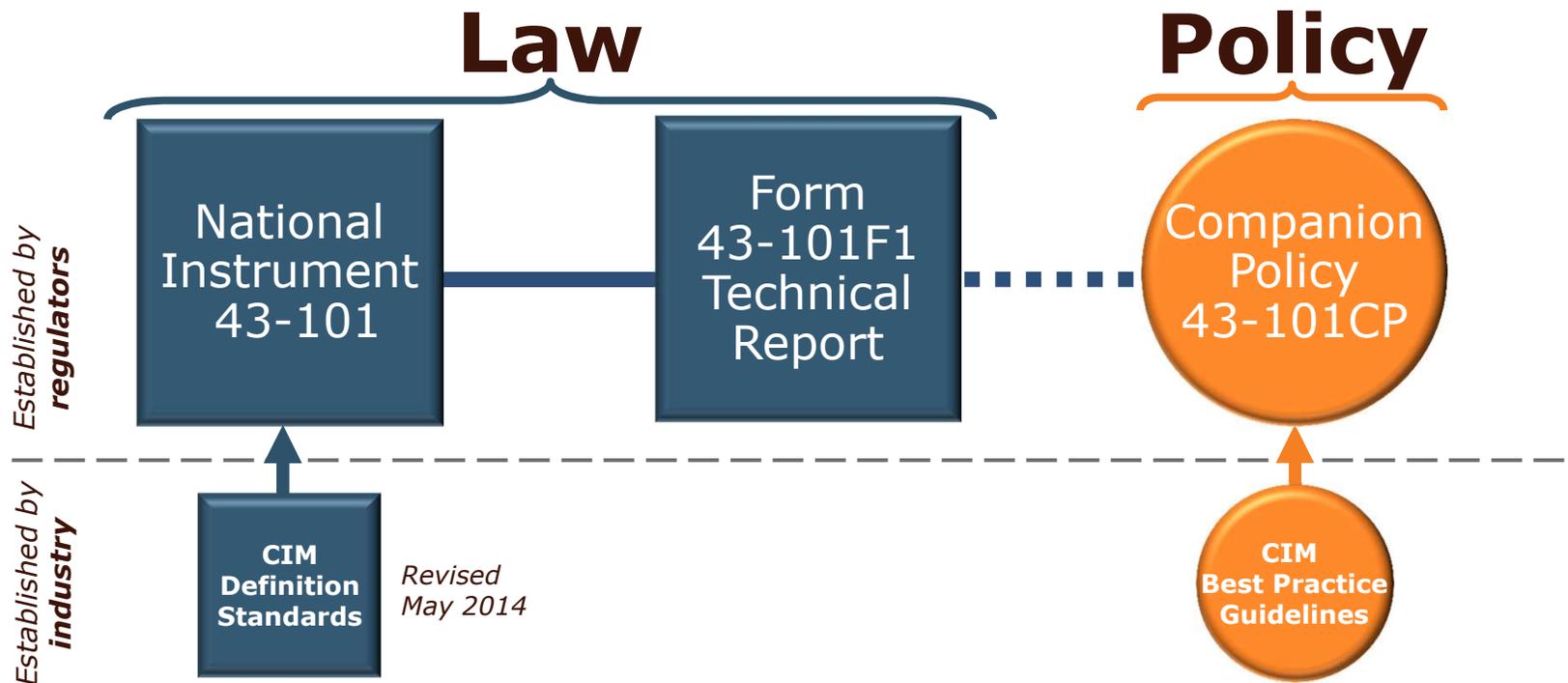


TSX, TSXV, NEX, CSE

Technical review staff

- BCSC - 3
- OSC - 2
- AMF - 2
- TSX - 1
- TSX-V - 3
- IIROC - 1

3 Parts to NI 43-101 (aka the "Mining Rule")



What are the core principles of NI 43-101?



Qualified
Person



Standards &
Best Practices



Technical
Report

"Disclosure with professional accountability"

CIM Definition Standards

CIM DEFINITION STANDARDS - For Mineral Resources and Mineral Reserves

Prepared by the *CIM Standing Committee on Reserve Definitions*
Adopted by CIM Council on May 10, 2014

FOREWORD

The CIM Definition Standards on Mineral Resources and Reserves (CIM Definition Standards) establish definitions and guidance on the definitions for mineral resources, mineral reserves, and mining studies used in Canada. The Mineral Resource, Mineral Reserve, and Mining Study definitions are incorporated, by reference, into National Instrument 43-101 – Standards of Disclosure for Mineral Projects (NI 43-101). The CIM Definition Standards can be viewed on the CIM website at www.cim.org.

CIM Best Practice Guidelines

- CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines (2003-2012)
 - Potash
 - Industrial minerals
 - Coal
 - Uranium
 - Laterites
 - Placers
 - Rock-hosted diamonds
 - Mineral brines
- CIM Guidance on Commodity Pricing in Resource and Reserve Estimation (2015)
- CIM Best Practice Guidelines for Mineral Processing (2011)
- CIM Guidelines for Reporting of Diamond Exploration Results (2003)
- CIM Exploration Best Practice Guidelines (2000)



Where to find CIM Definition Standards and CIM Best Practice Guidelines

The screenshot shows the CIM website interface. At the top, the navigation menu includes 'HOME', 'ABOUT CIM', 'NEWS & EVENTS', 'SOCIETIES & BRANCHES', 'PUBLICATIONS & TECHNICAL RESOURCES' (circled with a red '1'), 'STUDENTS', and 'MEMBER SERVICES'. Below the navigation, there are sections for 'Publications', 'Technical Resources', and 'Industry Resources'. The 'Standards & Guidelines for Resources & Reserves' link is circled with a red '2'. On the right side, there is a 'Standards Home' section with a search bar and a dropdown menu for 'Select Resource Site...'. Below this, the 'Standards & Guidelines for Resources & Reserves' page is shown, with a sidebar containing 'About Us', 'Official Standards & Guidelines' (circled with a red '3'), 'CIM Definition Standards for Mineral Resources and Mineral Reserves', 'CIM Definition Standards - Industry Consultation', 'CSA-CIM Working Committee', 'CIM Best Practice Guidelines' (circled with a red '3'), and 'Canadian Disclosure Regulations for Minerals, Oil & Gas'. Arrows point from the text 'CIM Definition Standards' to the 'Official Standards & Guidelines' link and from 'CIM Best Practice Guidelines' to the 'CIM Best Practice Guidelines' link.



www.cim.org

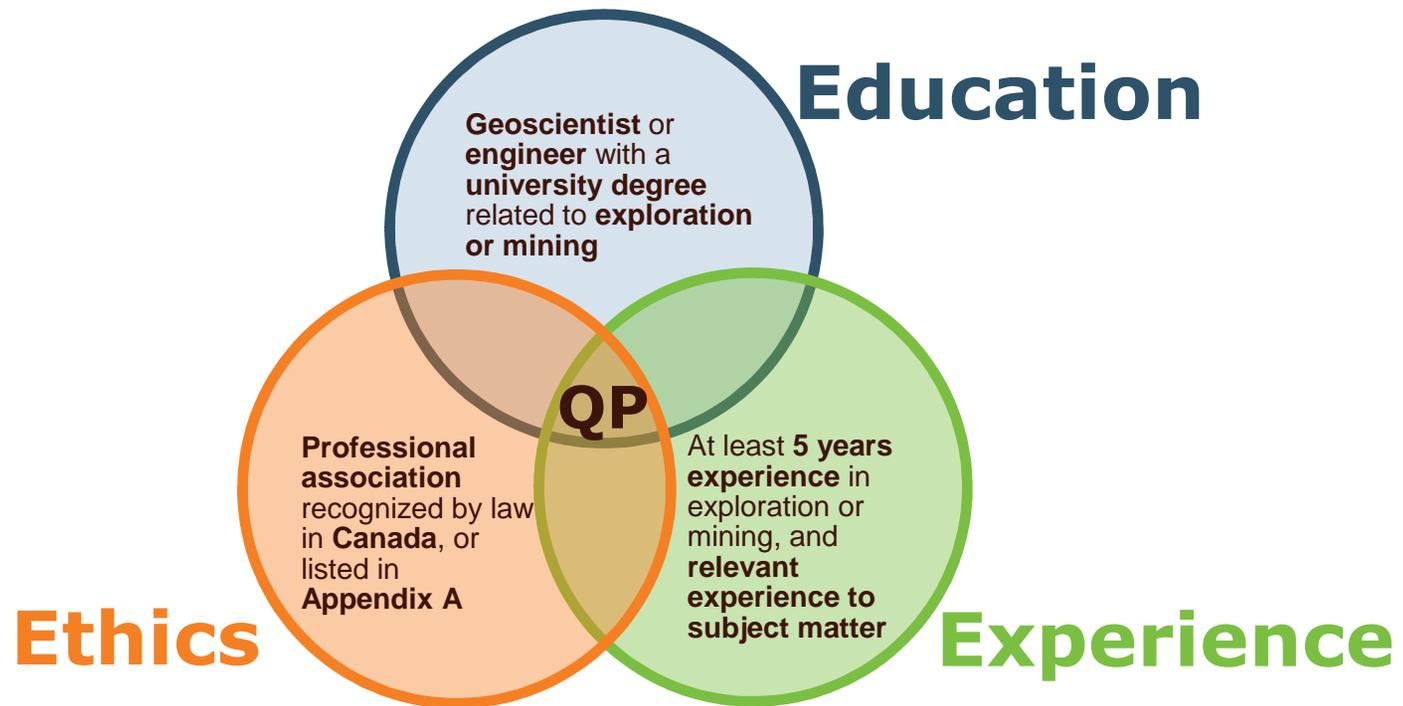


Qualified Person

"What it all comes down to, and always will, is the integrity, honesty, competence and experience of the person performing the work—period!"

B. Cook, Exploration Insights – December 11, 2013

3 "E"s of a qualified person



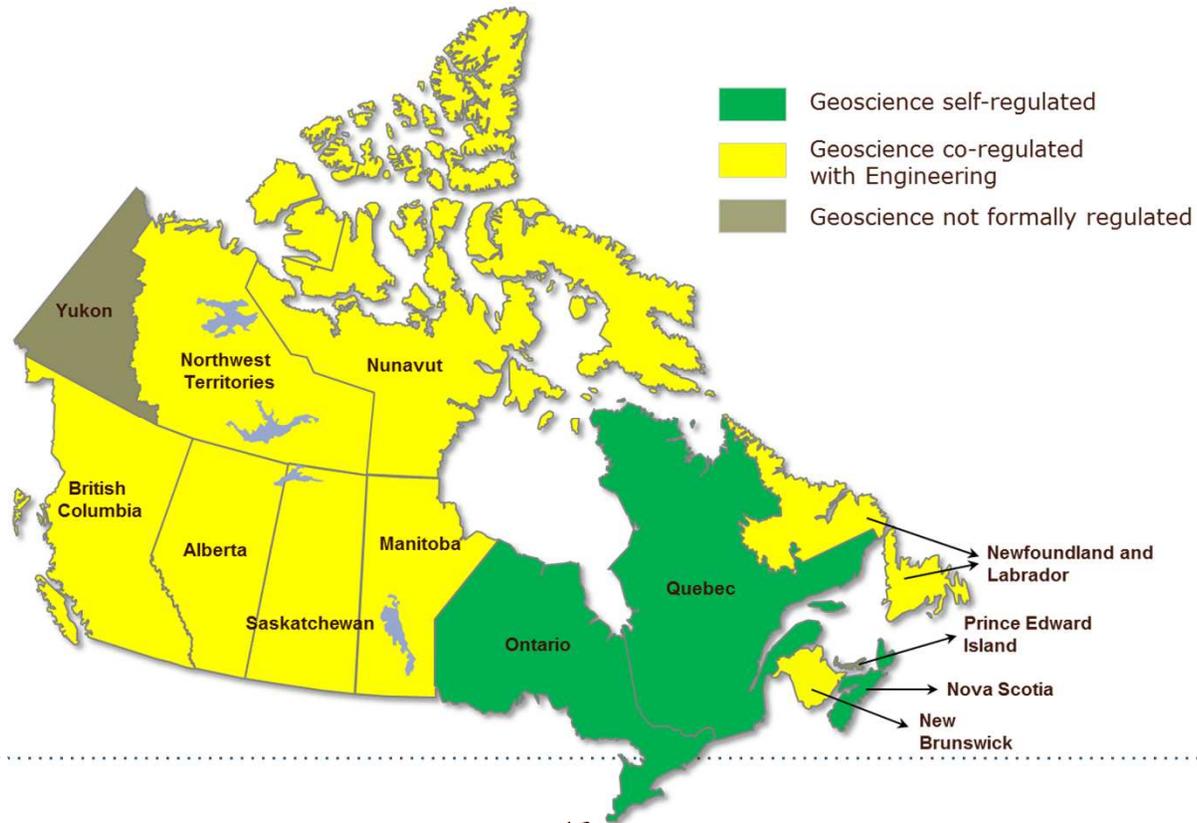
4th “E”

Expertise with the requirements and obligations of **NI 43-101**

- Disclosure prepared in compliance with NI 43-101 requires an additional skill set including a high level of proficiency with:
 - CIM Definition Standards
 - CIM Best Practice Guidelines
 - NI 43-101 disclosure rules and policies
 - CSA staff notices and guidance

Professional competence does not automatically imply NI 43-101 disclosure competence

Ethics: Canadian professional associations



Ethics: Appendix A - Foreign associations

(Feb. 25, 1016)

		Foreign Association	Membership Designation
United States	}	American Institute of Professional Geologists (AIPG)	Certified Professional Geologist (CPG)
		The Society for Mining, Metallurgy and Exploration, Inc. (SME)	Registered Member
		Mining and Metallurgical Society of America (MMSA)	Qualified Professional (QP)
		Any state in the United States of America	Licensed or certified as a professional engineer
Europe	}	European Federation of Geologists (EFG)	European Geologist (EurGeol)
		Institute of Geologists of Ireland (IGI)	Professional Member (PGeo)
		Institute of Materials, Minerals and Mining (IMMM)	Prof. Member (MIMMM), Fellow (FIMMM), Chart. Sci. (CSi MIMMM), or Chart. Eng. (CEng MIMMM)
Australasia	}	Geological Society of London (GSL)	Chartered Geologist (CGeol)
		Australasian Institute of Mining and Metallurgy (AusIMM)	Fellow (FAusIMM) or Chart. Prof. Member or Fellow [MAusIMM(CP), FAusIMM(CP)]
		Australian Institute of Geoscientists (AIG)	Member (MAIG), Fellow (FAIG) or Reg. Prof. Geosci. Member or Fellow (MAIG RPGeo, FAIG RPGeo)
		The Institution of Engineers Australia (Engineers Australia)	Chartered Professional Engineer (CPEng)
South Africa	}	The Institution of Professional Engineers New Zealand (Engineers New Zealand)	Chartered Professional Engineer (CPEng)
		Southern African Institute of Mining and Metallurgy (SAIMM)	Fellow (FSAIMM)
		South African Council for Natural Scientific Professions (SACNASP)	Professional Natural Scientist (Pr.Sci.Nat.)
Chile		Engineering Council of South Africa (ECSA)	Professional Engineer (Pr.Eng.) or Prof. Certificated Engineer (Pr.Cert.Eng.)
Chile		Comisión Calificadora de Competencias en Recursos y Reservas Mineras	Registered Member
Russia		Russian Society of Subsoil Use Experts (OERN)	Expert

“Relevant experience” - QP self assessment



"The qualified person should be clearly satisfied that they could face their peers and demonstrate competence and relevant experience in the commodity, type of deposit and situation under consideration"



www.cim.org

*Article: "Standards for QPs: how to evaluate relevant experience"
C. Waldie & J. Whyte, Jun/Jul 2012, CIM Magazine*

5 “C”s of the QP’s responsibility

- **Comply** with your professional association’s code of ethics
 - Perform work only in your area of competency and be honest and objective
- **CIM** definition standards and best practices
 - Follow CIM Standards and Best Practice Guidelines
- **Conduct** data verification
 - Perform a reasonable level of due diligence and validation of technical data
- **Communicate** the project risks
 - Clearly report on the material risks in a manner understandable to investors
- **Check** the company’s disclosure
 - Helps reduce the risk of being misquoted

5 “C”s of the company’s responsibility

- **Company** is responsible for its disclosure
 - Company’s directors and officers are responsible for their disclosure
- **Compliance** with rules and policies
 - Must comply with securities laws and stock exchange policies
- **Choose** an appropriate QP
 - Company is responsible for choosing an appropriate QP for the task
- **Current** site visit
 - Company must arrange its affairs so a QP can carry out a current site visit
- **Correctly** use the QP’s information and advice
 - Allow the QP to review the technical disclosure, and any revisions to it, before filing



Misconceptions about NI 43-101

Remember:

- *NI 43-101 sets "minimum" standards for disclosure of technical information*
- *The qualified person, based on his/her relevant experience and professional judgement, is responsible for choosing the methods, assumptions, and practices used for verifying, interpreting, and reporting of the technical information*

NI 43-101: What it's meant to be

DISCLOSURE RULE

- Requires that public reporting of technical information is:
 - Signed off by a professional (QP) who takes responsibility for the information
 - Clear, balanced, and not misleading – transparency is key!
 - Understandable to a reasonably informed investor
 - Consistent in its use of standardized terms and definitions
 - Based on reasonable assumptions which are clearly explained
 - Unbiased and identifies the potential risks and uncertainties

NI 43-101: What it's not meant to be

- **It's not a guarantee of good work**
 - It places an obligation on the issuer to have work done by a QP
 - The QP is supposed to do it right
- **It's not a cookbook for mineral estimation**
 - The rule sets disclosure standards, not estimation practices
 - It's designed so others can review and judge the QP's work
- **It's not a vetting process at the regulatory agency**
 - Just because a technical report is filed doesn't mean it's compliant
 - It's the issuer's responsibility to comply

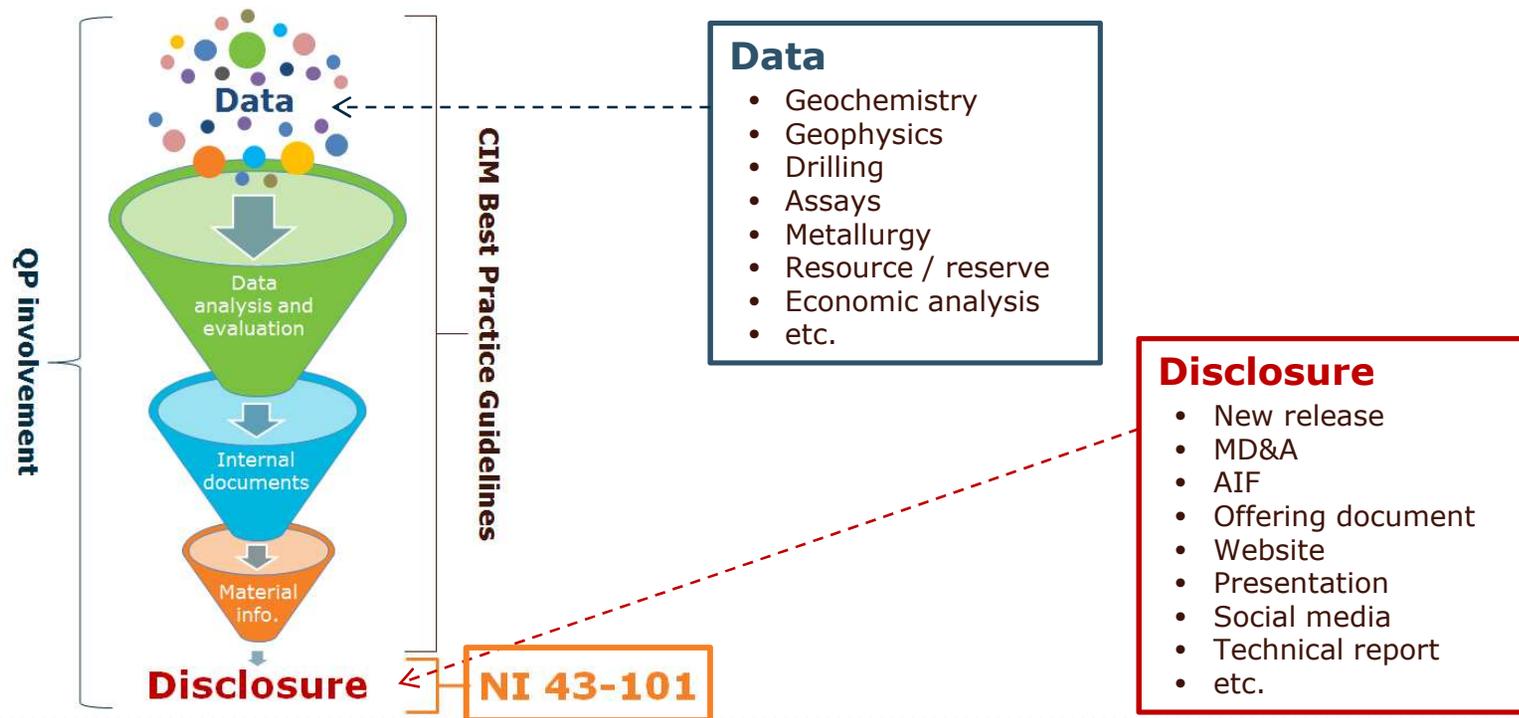


NI 43-101 Disclosure: Exploration to Production

"NI 43-101 plays a significant role in promoting public confidence in our markets and establishing Canada as the world leader in mining disclosure standards."

BCSC 2012 Mining Report – January 2013

Process: From data to disclosure



Websites = disclosure

The definition of “written disclosure” includes websites

- Information posted on or linked to an issuer’s website is considered to be “endorsed” by the issuer and part of its disclosure under NI 43-101
 - Examples of voluntary website disclosure:
 - Corporate presentations and fact sheets
 - Links to third party content (analysts’ reports, media articles, newsletters, etc.)
 - Social media posts and blogs

March 9, 2017 - CSA Staff Notice 51-348



CSA Staff Notice 51-348

Staff’s Review of Social Media Used by Reporting Issuers

April 9, 2015 - CSA Staff Notice 43-309



CSA Staff Notice 43-309

Review of Website Investor Presentations by Mining Issuers

Technical reviews by the regulator

(Conducted through a formal comment letter and response process)

- **Continuous disclosure review**

- Website (all of it)
- News releases (past year)
- MD&A (past year)
- AIF (if filed)
- Technical reports (current ones)
- Social media (linked to website)

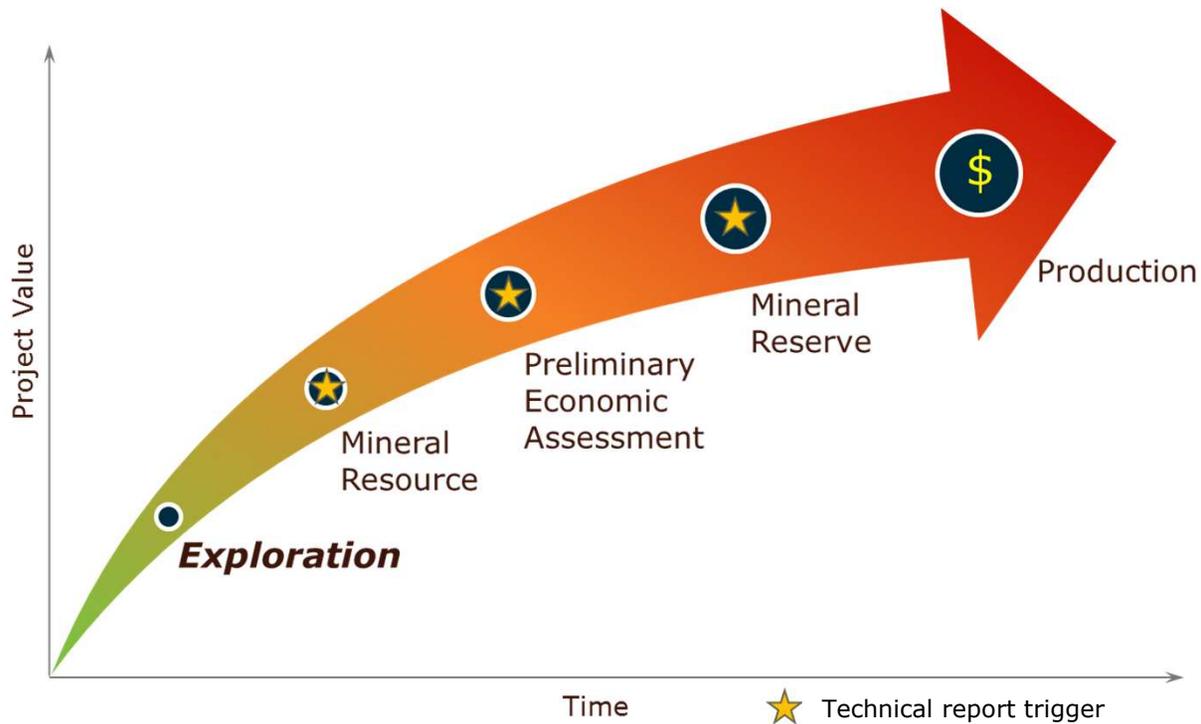
- **Prospectus review**

- Prospectus
- Documents incorporated by reference
 - AIF, news releases, MD&A, etc.
- Technical reports (current ones)
- Website (all of it)

So what if the issuer doesn't comply?

- *Clarifying / retracting news release*
- *Placed on refilings and errors list*
- *Placed on default list*
- *Cease trade order*
- *Enforcement order under the Act*
- *Class action lawsuit (civil liability under the Act)*
- *Securities Act charges (5 years/ \$5 million fine)*
- *Criminal Code charges (up to 14 years)*
- *QP - Professional liability and disciplinary action*

Mineral project stage – Exploration



Drilling results disclosure

- **Drilling information [s. 3.3]**

- Type of drilling
- Collar location, azimuth, and dip of drill holes
- Relevant assays and depth of samples
- Higher grade intervals within lower grade intersection
- True widths of mineralization, if known
- QA/QC program applied

- **Lab information [s. 3.3]**

- Analytical method and sample size
- Name and location of lab and relationship to the company

- **Data verification [s. 3.2]**

- Statement of how the QP verified the data, or reasons for failure to verify

Potentially misleading disclosure!

- *Reporting visual estimates of mineralization*
 - *Reporting "non-standard" weighted-average intersections*
-

Historical estimate disclosure

- **Disclosing a historical estimate [s. 2.4]**

- Use the original terminology
- Identify source & date of historical estimate, including any technical report
- Comment on relevance and reliability of the historical estimate
- Provide key assumptions about how the historical estimate was prepared
- State whether or not historical estimate uses CIM categories
- Comment on work program needed to upgrade or verify the historical estimate
- State with equal prominence the following:
 - *QP has not done sufficient work to classify historical estimate as a current resource*
 - *Company is not treating the historical estimate as a current resource*

"Historical estimate" – a non-verified estimate prepared prior to issuer's interest in the property

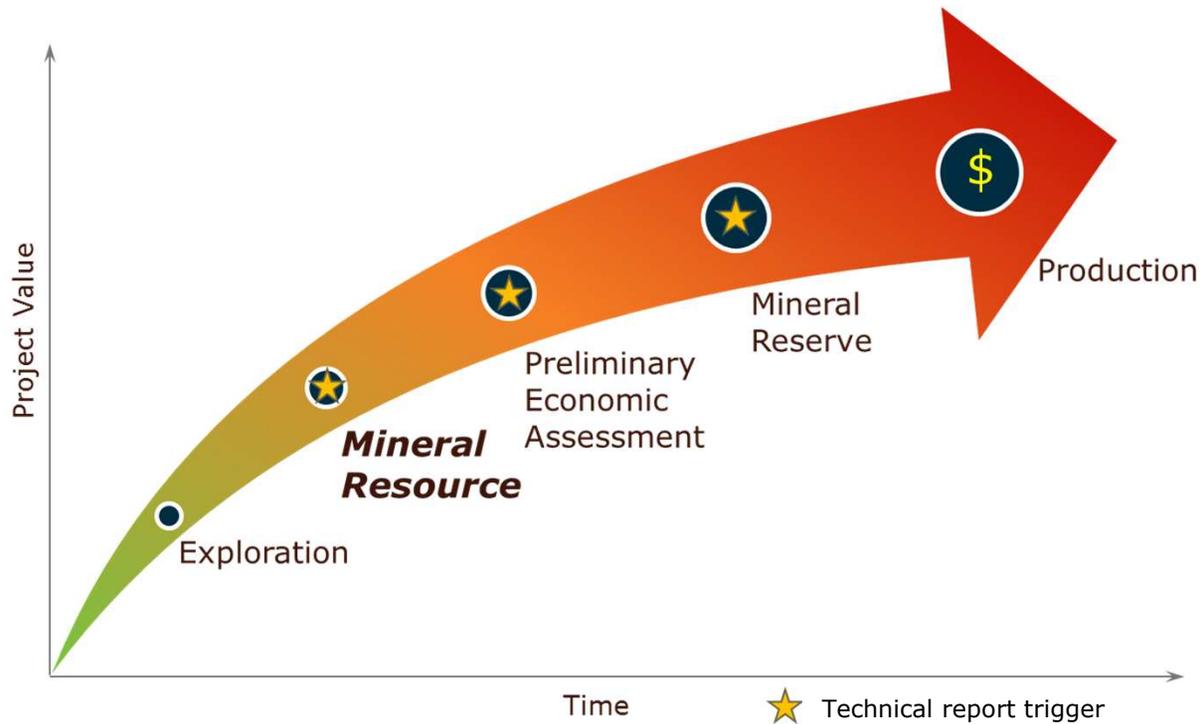
Exploration target disclosure

- **Disclosing an exploration target [s. 2.3(2)]**
 - Provide a range of tonnes and grade
 - Provide the basis on which exploration target has been determined
 - States with equal prominence the following:
 - *Potential quantity and grade is conceptual in nature*
 - *Insufficient exploration to define a mineral resource*
 - *Uncertain if a mineral resource estimate will be delineated*

Exploration target is not defined in CIM or NI 43-101 (but is defined in CRIRSCO)

- *Statement of the exploration potential in a defined geological setting*
- *Insufficient exploration to estimate a mineral resource*
- *Further exploration could test the validity of the exploration target*

Mineral project stage – Mineral resource



Mineral resource

- **Definition of a mineral resource [CIM Definition Standards - May 2014]**
 - Concentration or occurrence of solid material of economic interest in or on the Earth's crust
 - Form, grade or quality, and quantity is such that it has **reasonable prospects for eventual economic extraction**
 - Location, quantity, grade or quality, continuity and other geological characteristics are known, estimated or interpreted from specific geological evidence and knowledge, including sampling

Additional Guidance:

- *Tonnes & grade figures are not precise calculations and should be referred to as "estimates"*
 - *Round-off the estimate to a reasonable number of significant figures (i.e. 2 to 3)*
-

CIM guidance – “reasonable prospects”

- Implies a **judgment call by the QP** in respect of the technical and economic factors likely to influence the prospect of eventual economic extraction
- Basis for determining “reasonable prospects” needs to be clearly stated and should include:
 - Cut-off grade
 - Commodity price
 - Metallurgical recovery
 - Mining and processing method
 - Mining, processing, and general and administrative costs

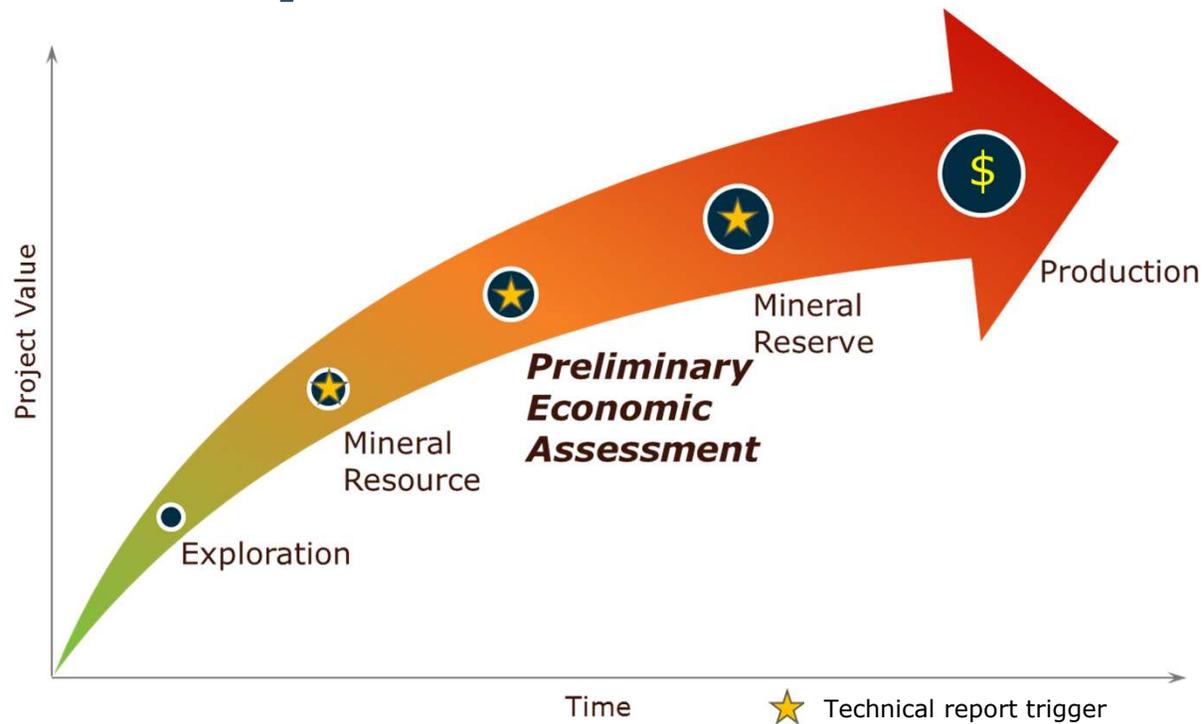
“Resource estimates are expressions of judgement and opinion based on knowledge, experience, and industry practice”

Forward looking information cautionary statement

Mineral resource disclosure

- **Disclosing a mineral resource [s. 2.2] and [s. 3.4]**
 - CIM categories of mineral resources (inferred, indicated, and measured)
 - Quantity and grade of each resource category
 - Inferred resources reported separately from other categories
 - Tonnes and grade for each category if the contained metal is disclosed
 - Effective date of the resource estimate
 - Key assumptions, parameters, and methods used
 - Any known risks that could materially affect potential development
 - Statement required if results of an economic analysis of resources is disclosed:
 - *“mineral resources that are not mineral reserves do not have demonstrated economic viability”*

Mineral project stage – Preliminary economic assessment (PEA)



Preliminary economic assessment

- **Definition of a “preliminary economic assessment” [s. 1.1]**
 - Means a study, other than a prefeasibility (PFS) or feasibility study (FS), that includes an economic analysis of the potential viability of mineral resources
- Appropriate uses of a PEA
 - Road map for planning and strategic decision making
 - Preparing for a prefeasibility study
 - Public disclosure of the potential economics to raise capital and advance the project

Limitations of a PEA

- PEA-level study can be a very useful, but it has limitations:
 - Underestimates the costs and complexities of the project
 - Sets expectations for NPV, IRR, etc. that may not be achieved in later studies (PFS/FS)
 - Often uses overly optimistic metal recoveries and metal price assumptions
 - Tends to be overly reliant on converting inferred resources to indicated resources
 - Early permitting process may restrict changes to the future mine design
 - May be misleading if the PEA treats inferred resources as mineral reserves
 - High risk of project failure if the PEA is used as basis for making a production decision

PEA after mineral reserves is often a BIG disclosure problem – much more on this later

Preliminary economic assessment disclosure

- **Disclosing a PEA [s. 2.3(3)]**

- May disclose the results of a PEA that includes inferred resources if the disclosure states with equal prominence:
 - *PEA is preliminary in nature*
 - *Includes inferred resources that are too speculative geologically to have the economic considerations applied to them*
 - *No certainty that the PEA will be realized*

- Also:

- States the basis and assumptions for the PEA
- Describes the impact of the PEA on any previous PFS or FS

Production decision without mineral reserves

- Guidance [Companion Policy s. 4.2(6)]
 - **Decision is the responsibility of the issuer and its management and board**
 - Decision is typically based on at least a prefeasibility study establishing mineral reserves which reduces the risk of economic and technical failure
 - Without disclosing the added risks, the issuer may be misleading investors
- Quarterly MD&A
 - Disclose that the production decision is not based on a technical report supporting mineral reserves

How do you avoid making misleading disclosure? - State the RISKS!

- *Production decision is not based on demonstrated economic viability (i.e. mineral reserves)*
 - *Such projects have a much higher risk of economic or technical failure*
 - *Project failure may adversely impact the issuer's future profitability*
-

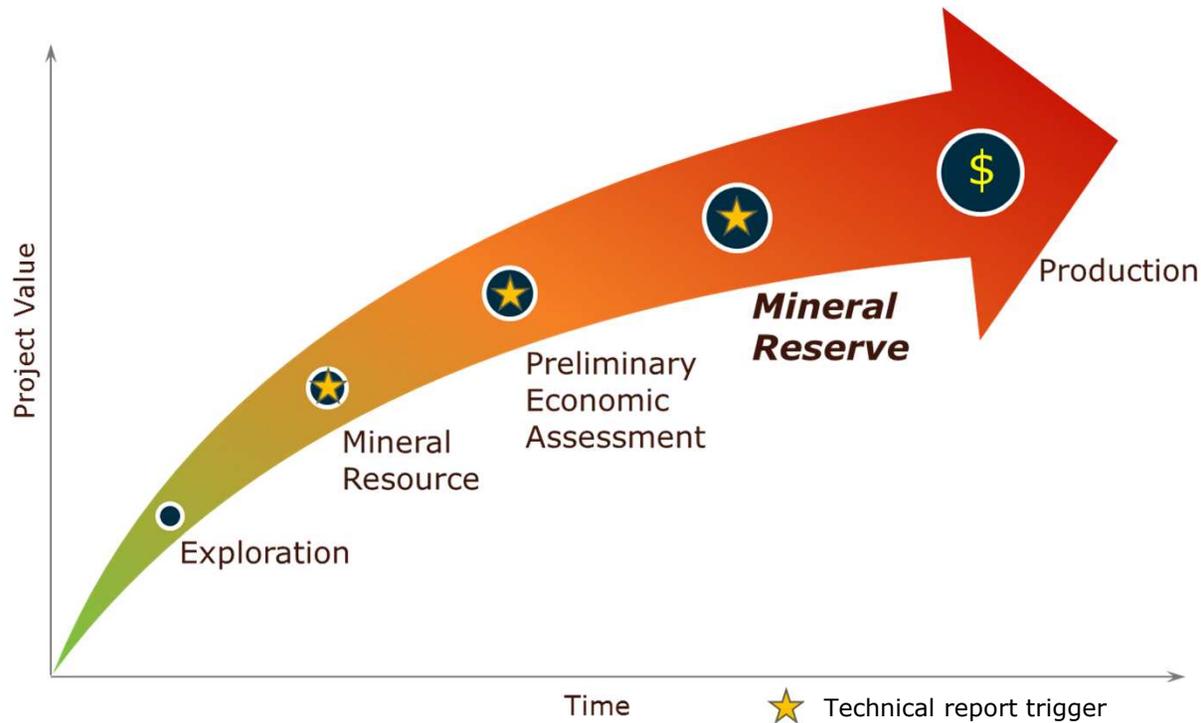
Example: Caution about production decision based on a PEA

Risks { *"The Company advises that it has not based its production decision on a feasibility study of mineral reserves, demonstrating economic and technical viability, and, as a result, there may be an increased uncertainty of achieving any particular level of recovery of minerals or the cost of such recovery, including increased risks associated with developing a commercially mineable deposit."*

Impact of risks { *Historically, such projects have a much higher risk of economic and technical failure. There is no guarantee that production will begin as anticipated or at all or that anticipated production costs will be achieved.*
Failure to commence production would have a material adverse impact on the Company's ability to generate revenue and cash flow to fund operations. Failure to achieve the anticipated production costs would have a material adverse impact on the Company's cash flow and future profitability."

PEA caution { *The Company further cautions that the PEA is preliminary in nature. No mining study has been completed. Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no certainty that the PEA will be realized."*

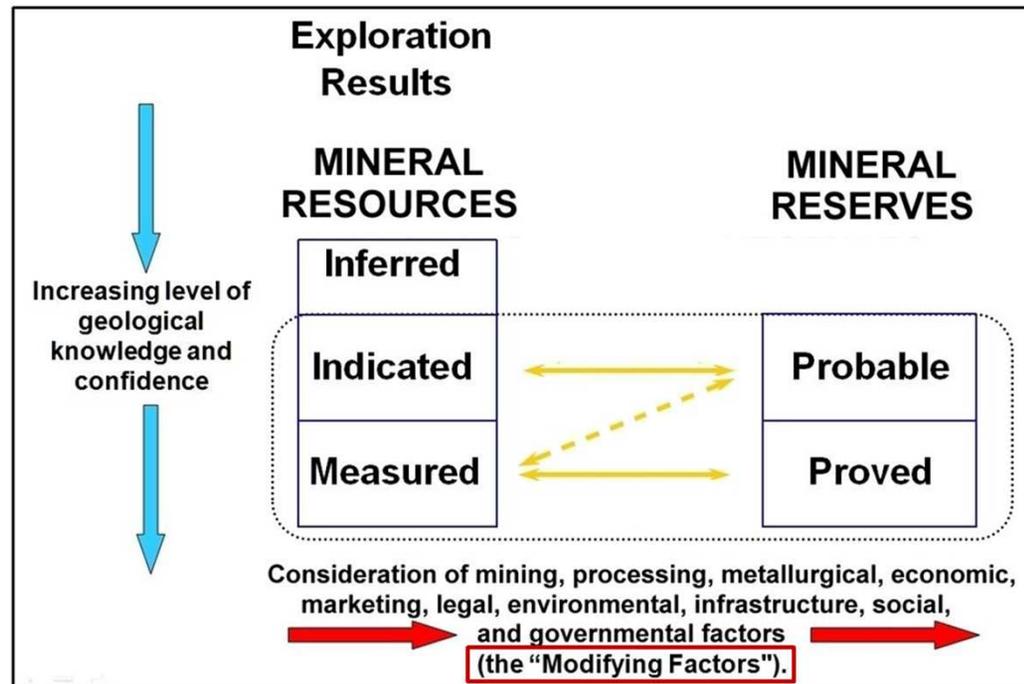
Mineral project stage – Mineral reserve



Mineral reserve

- **Definition of a mineral reserve [CIM Definition Standards - May 2014]**
 - Economically mineable part of a measured and/or indicated mineral resource after taking account of all relevant **Modifying Factors**
 - Includes diluting materials and allowances for losses which may occur during mining
 - Reserves are defined by studies at prefeasibility (PFS) or feasibility (FS) level that demonstrate at the time of reporting extraction could be justified

Relationship between resources & reserves



CRIRSCO International Reporting Template Nov. 2013

Mineral reserve disclosure

- **Disclosing a mineral reserve [s. 2.2] and [s. 3.4]**
 - CIM categories of mineral reserves (proven and probable reserves)
 - Quantity and grade of each reserve category
 - Effective date of the reserve estimate
 - Key assumptions, parameters, and methods used
 - Any known risks that could materially affect potential development
 - Statements:
 - Whether mineral resource are reported inclusive or exclusive of mineral reserves?
 - "*Mineral resources that are not mineral reserves do not have demonstrated economic viability*" if results of an economic analysis of resources is disclosed

Reclassifying reserves back to resources

Guidance from CRIRSCO (2013)

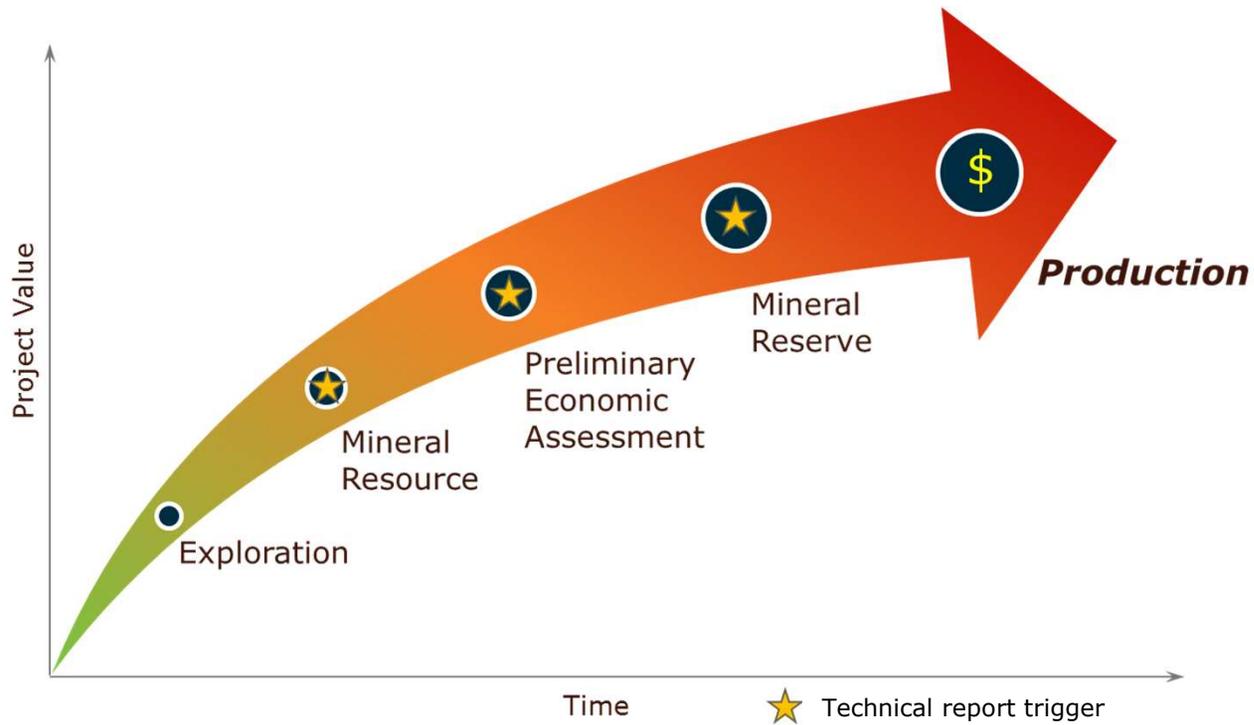
- Clause 29
 - If re-evaluation indicates that any part of the mineral reserves is no longer viable, such mineral reserves **must** be re-classified as mineral resources

SME Guide (2017)

- Clause 48 "Reserve Test"
 - A Reserve Test should be conducted at least annually for Mineral Reserves to verify that at a minimum the future undiscounted cash flow from reserves is positive
 - The cash flow ignores all sunk costs and only considers future operating (including royalties and severance taxes) and closure costs as well as future capital costs

Feb 6, 2018: Barrick is reclassifying Pascua-Lama's proven and probable gold reserves of approx. 14 Moz, which are based on an open pit mine plan, as measured and indicated resources

Mineral project stage – Production



Annual resource & reserve estimates – Updates and reconciliation

Annual Information Form (AIF) requires disclosure of mineral resource and mineral reserve estimates as at the issuer's financial year end

- Projects in production
 - Provide an annual update of resource and reserve estimates
 - Good disclosure should also include reconciliation to the previous year's estimates
 - Annual estimates from a producing mine do not trigger a new technical report [see 43-101CP s. 4.2(10)]
- Projects not in production
 - AIF discloses the most recent resource and reserve estimates with effective dates

Note: AIF Form 51-102F2 (Item 5.4) was revised in June 2015

Technical Disclosure Best Practices and Tips for Mining Professionals and Executives

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March 7, 2018



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Topics To Be Discussed

- 2017 Year in Mining
- TMX Disclosure Policies
- Material Information
- Timely Disclosure Rules
- Technical Disclosure Requirements
- Common Disclosure Issues
- Useful Contacts
- News Release Exercise

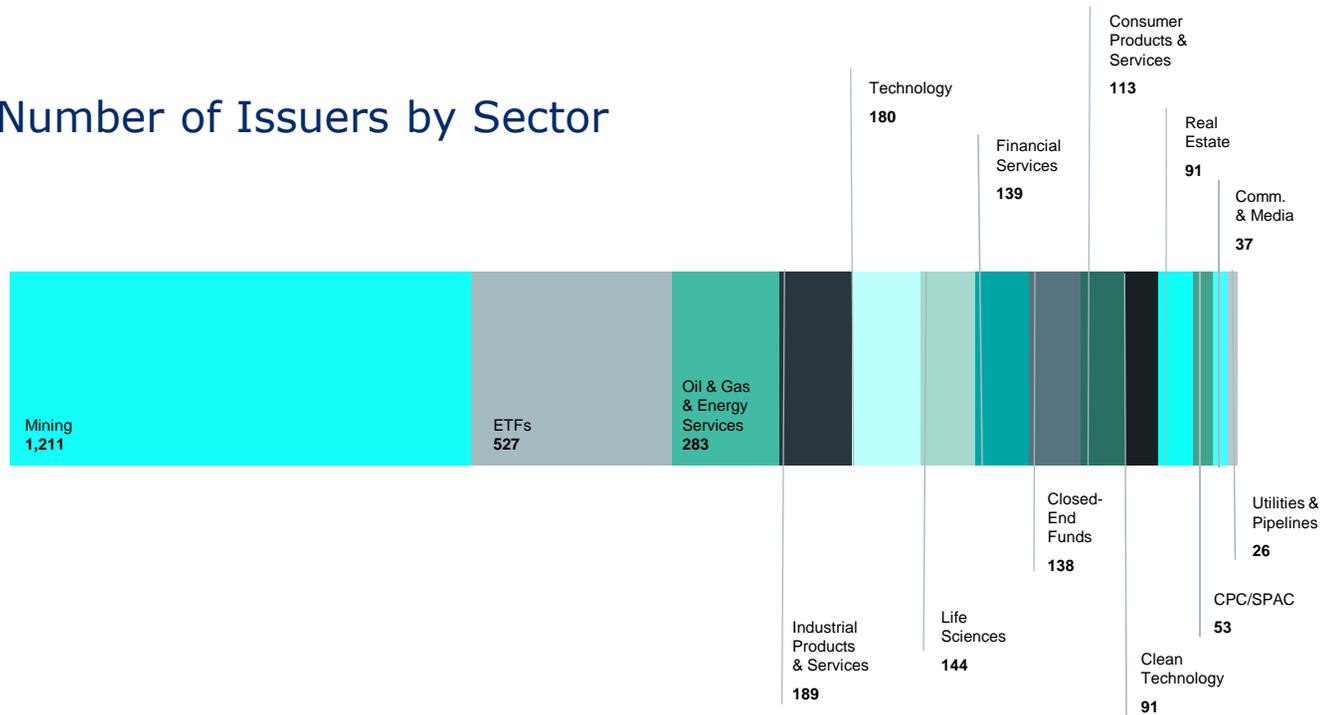


"If you think compliance is expensive, try non-compliance"

- Former U.S. Deputy Attorney General Paul McNulty

2017 Year in Mining

Number of Issuers by Sector



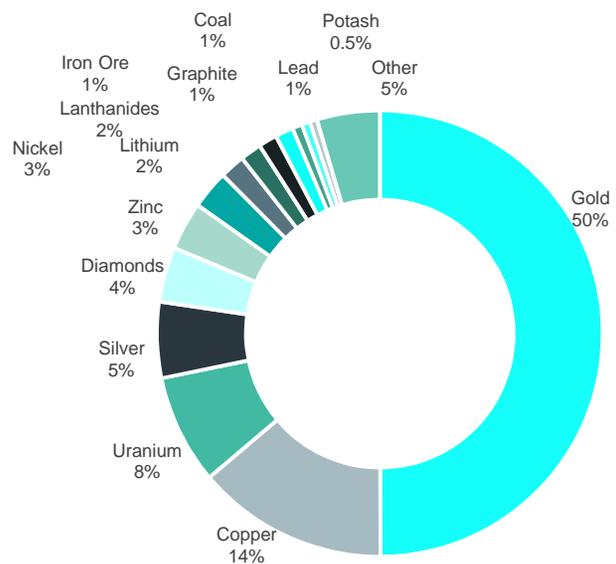
2017 Year in Mining

Number of TSX/TSXV Mining Properties by Stage

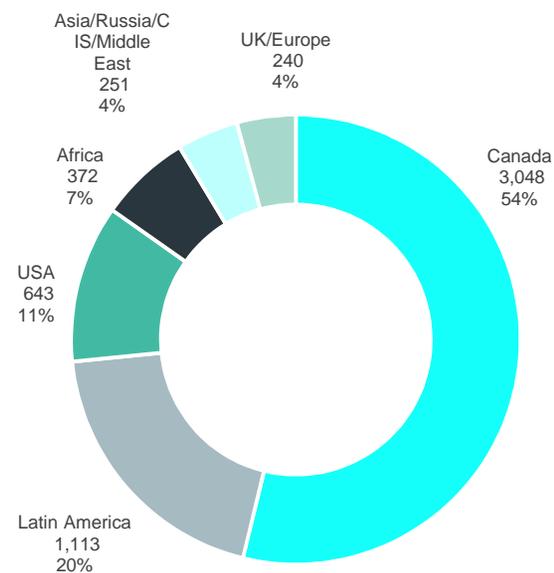


2017 Year in Mining

Breakdown of TSX and TSXV Mining Projects by Primary Metals



Breakdown of TSX and TSXV Mining Projects by Location



The Leading Exchange

2017 Mining Markets at a Glance

	TSX	TSXV	TSX & TSXV	LSE	AIM	ASX	JSE	HKEx	NYSE & NYSE MKT
Number of Mining Issuers Listed	224	987	1,211	32	117	616	22	46	100
Equity Capital Raised (C\$ billions)	5.2	3.2	8.4	0.2	0.7	5.4	1.4	4.4	3.2
Number of Financings	194	1,219	1,413	7	115	606	3	15	19
Market Capitalization (C\$ billions)	290.9	22.9	313.8	587.0	8.7	445.8	51.1	84.5	964.7
New Mining Listings	7	48	55	1	8	34	2	1	3

New Mining Listings in 2017

	Name	Root Ticker	QMV (C\$) at 31-Dec-2017	Type of Listing	HQ Location
TSX	Nexa Resources S.A.	NEXA	\$3,268 M	IPO	Brazil
	Clean TeQ Holdings Limited	CLQ	\$870 M	Other	Australia
	SolGold plc	SOLG	\$865 M	Other	Australia
	Ero Copper Corp.	ERO	\$569 M	IPO	BC
	Roxgold Inc.	ROXG	\$521 M	TSXV Grad	ON
	Gold Standard Ventures Corp.	GSV	\$514 M	TSXV Grad	BC
	Leagold Mining Corporation	LMC	\$442 M	TSXV Grad	BC
	First Mining Finance Corp.	FF	\$342 M	TSXV Grad	BC
	Excelsior Mining Corp.	MIN	\$252 M	TSXV Grad	BC
	Cardinal Resources Limited	CDV	\$203 M	Other	Australia
	Nighthawk Gold Corp.	NHK	\$140 M	TSXV Grad	ON
	Titan Mining Corporation	TI	\$124 M	IPO	BC
	Ascendant Resources Inc.	ASND	\$52 M	TSXV Grad	ON
	Mason Resources Corp	MNR	\$19 M	Other	BC
	NewCastle Gold Ltd. (acquired Dec. 2017)	NCA	NA	TSXV Grad	ON
	TSX Venture	New Pacific Metals Corp.	NUAG	\$194 M	COB
LSC Lithium Corporation		LSC	\$129 M	QT from NEX	ON
Fiore Gold Inc.		F	\$83 M	Other	ON
Superior Gold Inc.		SGI	\$73 M	IPO	ON
SRG Graphite Inc.		SRG	\$72 M	RTO	Quebec
Integra Resources Corp.		ITR	\$53 M	Other	ON
Agua Resources Limited		AGRL	\$49 M	Other	Australia
Adventus Zinc Corporation		ADZN	\$18 M	IPO	ON
Avidian Gold Corp.		AVG	\$17 M	QT from NEX	ON
Lithoquest Diamonds Inc.		LDI	\$16 M	RTO from NEX	BC
M2 Cobalt Corp.		MC	\$14 M	QT	BC
Fireweed Zinc Ltd.		FWZ	\$14 M	IPO	BC
Contact Gold Corp.		C	\$14 M	RTO	BC
Compass Gold Corporation		CVB	\$12 M	RTO from NEX	BC
URZ Energy Corp.		URZ	\$12 M	IPO	BC
Abraplata Resource Corp.		ABRA	\$11 M	RTO from NEX	BC
Five Star Diamonds Limited	STAR	\$11 M	QT from NEX	Brazil	

Continued on next slide.

New Mining Listings in 2017 (cont'd)

Name	Root Ticker	QMV (C\$) at 31-Dec-2017	Type of Listing	HQ Location
Canadian Orebodies Inc.	CORE	\$10.3 M	Other	ON
Group Eleven Resources Corp.	ZNG	\$10.3 M	IPO	Ireland
VR Resources Ltd.	VRR	\$9.7 M	QT	BC
Boreal Metals Corp.	BMX	\$8.8 M	Other	BC
Kenadyr Mining (Holdings) Corp.	KEN	\$8.8 M	QT from NEX	BC
Canadian Mining Corp.	CNG	\$8.2 M	Other	BC
Golden Ridge Resources Ltd.	GLDN	\$7.9 M	RTO	BC
Ceylon Graphite Corp.	CYL	\$7.5 M	RTO	NS
Cabral Gold Inc.	CBR	\$7.4 M	RTO from NEX	BC
Goliath Resources Limited	GOT	\$7.3 M	QT from NEX	Quebec
Aintree Resources Inc.	AIN	\$6.9 M	QT from NEX	BC
Aloplex Gold Inc.	AEX	\$6.8 M	IPO	ON
Aztec Minerals Corp.	AZT	\$6.6 M	IPO	BC
Tethyan Resources PLC	TETH	\$6.2 M	Other	Jersey
Global Energy Metals Corporation	GEMC	\$5.5 M	Other	BC
Harfang Exploration Inc.	HAR	\$5.5 M	QT from NEX	Quebec
Silver Viper Minerals Corp.	VIPR	\$5.4 M	IPO	BC
OneCap Investment Corporation	OIC	\$5.2 M	QT from NEX	Quebec
Kintavar Exploration Inc.	KTR	\$4.5 M	QT from NEX	Quebec
Rockridge Gold Ltd.	ROCK	\$3.3 M	IPO	BC
Broome Capital Inc.	BCP	\$3.1 M	QT from NEX	BC
BTU Metals Corp.	BTU	\$3.1 M	QT from NEX	BC
Trifecta Gold Ltd.	TG	\$3.0 M	Other	BC
Voyageur Minerals Ltd.	VM	\$2.4 M	QT from NEX	AB
Orford Mining Corporation	ORM	\$2.3 M	QT from NEX	ON
Casa Minerals Inc.	CASA	\$2.1 M	QT from NEX	BC
Enerspar Corp.	ENER	\$1.4 M	QT from NEX	ON
Essex Minerals Inc.	ESX	\$1.2 M	IPO	BC
Inomin Mines Inc.	MINE	\$1.1 M	QT	BC
Riley Resources Corp.	RLY	\$0.4 M	QT	BC
Saifish Royalty Corp.	FISH	-	Other	British Virgin Islands

TSX Venture

TSX: 2017 Largest Mining Financings

Company	Gross Proceeds (C\$)	Type of Financing	Exploring In	Exploring For
Nexa Resources S.A.	\$732 M	IPO	Brazil, Peru	Zinc
Alamos Gold Inc.	\$329 M	PO	Manitoba, Mexico, Ontario	Gold
Osisko Gold Royalties Ltd. (Nov.)	\$300 M	PO	Royalty Streaming	Royalty Streaming
Osisko Gold Royalties Ltd. (Aug.)	\$275 M	PP	Royalty Streaming	Royalty Streaming
Trevali Mining Corporation	\$265 M	PP	Burkina Faso, Namibia, New Brunswick, Peru	Copper, Silver, Zinc
HudBay Minerals Inc.	\$242 M	PO	Arizona, Manitoba, Peru	Copper, Gold, Silver, Zinc
New Gold Inc.	\$233 M	PO/PP	Australia, Arizona, BC, Mexico	Gold
Continental Gold Inc.	\$184 M	PP	Colombia	Gold
Heron Resources Limited	\$140 M	PP	Australia	Copper, Gold, Zinc
Ero Copper Corp.	\$127 M	IPO	Brazil	Copper, Gold, Silver

TSXV: 2017 Largest Mining Financings

Company	Gross Proceeds (C\$)	Type of Financing	Exploring In	Exploring For
Cobalt 27 Capital Corp.	\$200 M	PO	Royalty Streaming	Royalty Streaming
Leagold Mining Corporation (Mar.)*	\$175 M	PO	Mexico	Gold
Trek Mining Inc. **	\$83 M	PP	Brazil, California	Gold
Bluestone Resources Inc.	\$80 M	PP	Guatemala	Gold, Silver
Leagold Mining Corporation (Apr.)*	\$67 M	PP	Mexico	Gold
Novo Resources Corp.	\$56 M	PP	Australia	Gold
Barkerville Gold Mines Ltd.	\$44 M	PP	BC	Gold
New Pacific Metals Corp.	\$44 M	PP	Bolivia, China, Yukon	Gold, Silver
Rathdowney Resources Ltd.	\$42 M	PP	Poland	Lead, Silver, Zinc
Itafos	\$42 M	PP	Brazil	Phosphate

TMX Disclosure Policies

- TSX Company Manual Timely Disclosure Policy (Sections 406 - 423.4)
 - Appendix B: Disclosure Standards for Companies Engaged in Mineral Exploration, Development & Production
- TSXV Corporate Finance Manual
 - Policy 3.3 Timely Disclosure
 - Appendix 3F Mining Standards Guidelines
 - Appendix 3E News Release Guidelines

The screenshot shows the TMX website header with the logo and navigation links: HOME, LISTINGS, TRADING, and TSX COMPANY SERVICES. Below the header is a banner image. The main content area is titled 'TSX & TSXV Issuer Resources'. Underneath, there is a section for 'TSX Issuer Resources' with a list of links: TSX Listings Staff, TSX Company Manual (circled in red), Staff Notices, TSX SecureFile, Corporate Governance, Continuous Disclosure, Declaring Dividends or Distributions, Issuer Fees, S&P/TSX Index Eligibility, and Third Party Contacts. Below this is a section for 'TSX Venture Exchange Issuer Resources' with a list of links: TSX Venture Exchange Corporate Finance Manual (circled in red), Publications, NEX, Info TSX Venture, TSX Venture Exchange Market Information, and Graduation to Toronto Stock Exchange.

Material Information

- TSX issuer responsible for determining if information to be disclosed is material
 - Sec. 407 and 410 provides examples
 - Material information must be disseminated on an approved news wire service
- TSXV specifies events deemed material in nature that require immediate disclosure
 - Policy 3.3 quite prescriptive
 - List found in Policy 3.3 – Sec. 3.8
- TSXV specifies material information that must be pre-filed with IIROC prior to disseminating news release (Policy 3.3 – Sec. 4.2)
 - Reverse Takeovers, Changes of Business or other reorganizations
 - Qualifying Transactions, Reviewable Transactions, including corporate acquisitions or dispositions
 - Change of control
 - Future-oriented financial information or other operating projections
 - Disclosure of mineral resources/ reserves or oil and gas reserves

Timely Disclosure Rules



- TSX news release dissemination
 - Material information between 8am to 5pm ET = always pre-file with IIROC before disseminating
 - Material information outside 8am to 5pm ET = always copy to IIROC and advise them of dissemination
 - Non-material information = not required to send copy to IIROC, but recommend in case wrong determination of materiality made
- IIROC may halt briefly to disseminate material news
- Technical news releases are reviewed and cleared by IIROC geologist

Timely Disclosure Rules



- TSX Venture news release dissemination
 - If significant announcement is ready to be made between 8am and 4pm ET, IIROC must be advised in advance by telephone or email
 - If announcement is to be released after 4pm ET, or before 8am ET, must leave IIROC a message summarizing pending announcement, at time announcement ready to be made
 - Refer to Policy 3.3 – Sec 4 news releases must follow Appendix 3E and 3F
- If waiting on a pre-filing decision or technical review please be patient and do not disseminate until instructed to do so by IIROC Market Surveillance

Technical Disclosure Requirements



- Technical disclosure requirements defined in NI 43-101 and CIM standards, and Appendix B for TSX issuers / Appendix 3F for TSXV
- Must identify Qualified Person (QP) as defined in NI 43-101 responsible for work conducted on property
- QP must confirm they have read and approved technical disclosure
- Websites, corporate presentations, fact sheets, continuous disclosure documents (AIF, MD&A, annual reports) must follow these rules
- Exchanges and Canadian Securities Administrators (CSA) routinely check for compliance

Technical Disclosure Requirements



Exploration and Drilling Results - Balanced Disclosure is Key!

- New project disclosure:
 - General description of geological environment
 - Type of samples and assay tests, location map or table of results
 - QA/QC procedures
 - Assay laboratory description and any independent data verification or auditing
- Early exploration activities/results (i.e. soil or geophysical surveys) must be described as preliminary in nature and not conclusive of a mineral deposit
- Analytical results should be reported in a timely manner and always report both positive and negative results including 'no significant assay' intervals

Technical Disclosure Requirements



Exploration and Drilling Results

- Report all assay results
 - If three holes are disclosed as part of a six hole program, balance must be reported as soon as assay results are available
 - Early exploration projects – disclose DH location-type, azimuth, dip, depth of holes
- Comment on the true width of the drill sample (state if not yet known)
- Metal equivalents
 - Disclose grade of each metal/mineral used to establish metal/mineral equivalent grade
 - Disclose metal prices used, recovery assumptions, and metal equivalent calculation
 - Conversions should be restricted to similar commodities, and not used to convert base metals to precious metals

Technical Disclosure Requirements



Production Cost Reporting

- Gold producers should follow the World Gold Council Production Cost Standard to provide further transparency into the costs associated with producing gold
- All-In Sustaining Costs (AISC) and All-In Costs – used by most major Canadian gold producers
- Future production cost reporting standards specific to base metal producers and other commodities will be coordinated through CSA & CIM

Common Disclosure Issues



1. Overly promotional language – immediately flagged by IIROC and Exchanges and if not vetted may result in news release in question being retracted and clarifying statement issued
 - × World Class Discovery!
 - × Bonanza Grades!
 - × Exceptionally High Grade Results!
 - World Class Deposit!
 - Abundant Visible Gold!
 - Spectacular and Extraordinary!
2. Burying bad/material news at the middle or end of a long news release
3. Improper use of metal equivalents leading to misleading technical disclosure
4. Not disclosing whether drill hole intersections are true widths, potential assay stretching issues, no discussion on sampling/assaying methods

Common Disclosure Issues



5. Qualified Person statement not included in technical disclosure, or QP has obviously not reviewed news release prior to being issued by company
6. Use of term "NI 43-101 compliant" in disclosure materials, and lack of disclaimers when reporting historical resource estimates
 - Please note there is no regulatory process for confirming whether a mineral resource or reserve estimate or technical report is "NI 43-101 compliant"
 - "... *XXX completed (or prepared) in accordance with NI 43-101*" or similar

Common Disclosure Issues



7. Misuse of “target for further exploration” or “exploration target” category

- Disclose only as range of tonnes & grades with supporting details and cautionary statement - NI 43-101 Restricted Disclosure Section 2.3(2)
- Economic analysis (PEA) cannot include exploration target tonnages & grades

8. Discussing production potential without economic analysis

- Any forward-looking comment regarding production without a supporting economic analysis and mining study (PEA, PFS or FS) will not comply with NI 43-101 reporting requirements
- Cannot quantify recovered metals or mine life, or any suggestion of production, profits or profitability

Common Disclosure Issues



9. Disclosing the results of a PEA, PFS or FS that do not also include after-tax economic results (NPV and IRR) for a project
10. QA/QC procedures not disclosed as required by NI 43-101
11. JORC resources not reconciled to CIM definitions
12. Adding Inferred Resources to Measured & Indicated Resources (permitted under JORC but not NI 43-101), and cautionary statements not included
13. Missing technical information required under NI 43-101 disclosure rules especially disclosure of exploration information & resource/reserve estimates

Useful Contacts

IIROC – Market Surveillance

TSX issuers filing news releases:

- TSX SecureFile (preferred option - encrypted)
- Tel: (416) 646-7220
- Fax: (416) 646-7263
- Email: pr@iiroc.ca

TSX Venture issuers filing news releases:

- Tel: (604) 643-2792
- Fax: (604) 643-2799
- Email: prwest@iiroc.ca

Toronto Stock Exchange (TSX)

Compliance and Disclosure:

- Tel: (416) 947-4767
- Toll Free: 1-888-873-8392
- E-mail: disclosure@tmx.com

Mining Disclosure and Listing Requirements:

- Tel: (416) 947-4447
- E-mail: paul.teniere@tmx.com

TSX Venture Exchange (TSXV)

Compliance and Disclosure:

- Tel: (604) 488-3124
- Fax: (604) 688-6051
- Email: complianceanddisclosure@tsxventure.com

News Release Exercise

Please Refer To Handouts

TMAC Resources Inc. (TSX:TMR)

NioCorp Developments Ltd. (TSX:NB)

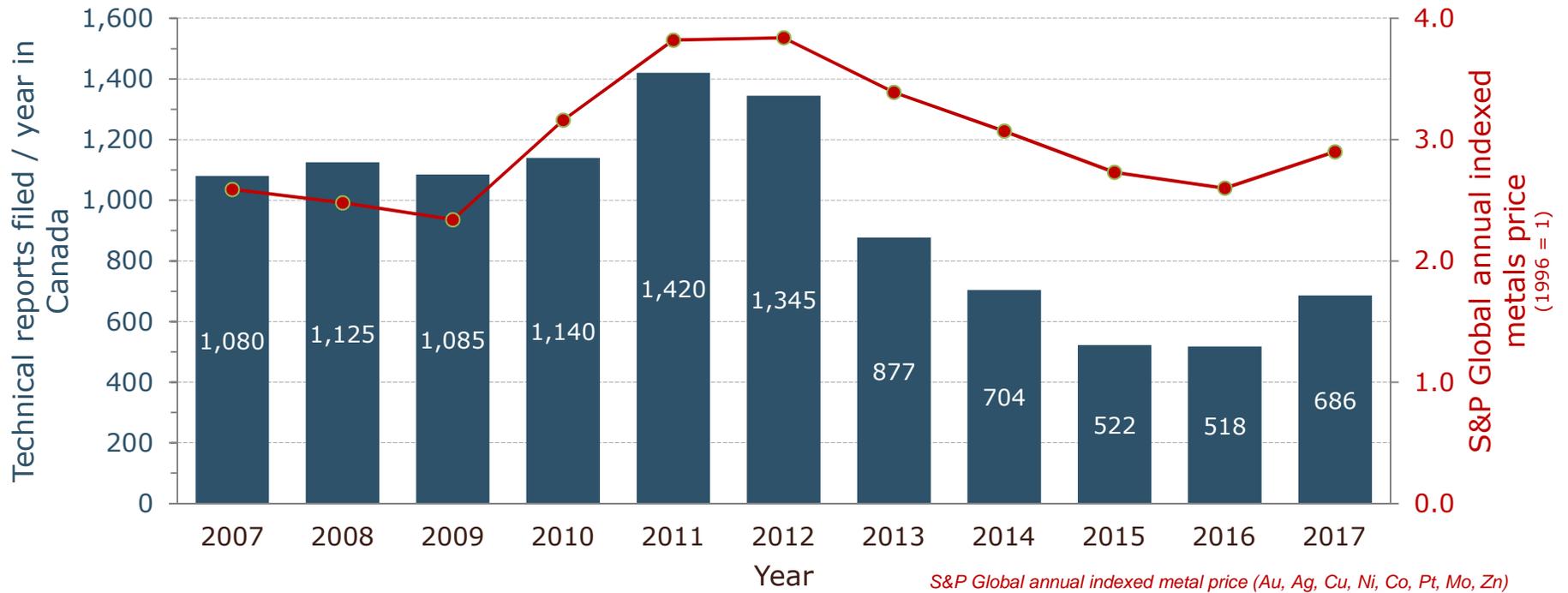




Technical Report Basics

Technical reports prepared in accordance with NI 43-101 support a mining company's most important asset – their material mineral properties

Technical reports filed per year (2007 to 2017)



Not all technical reports are created equal!



- The quality and reliability of the technical report all comes down to the integrity, honesty, competence, and experience of the QPs preparing the technical report

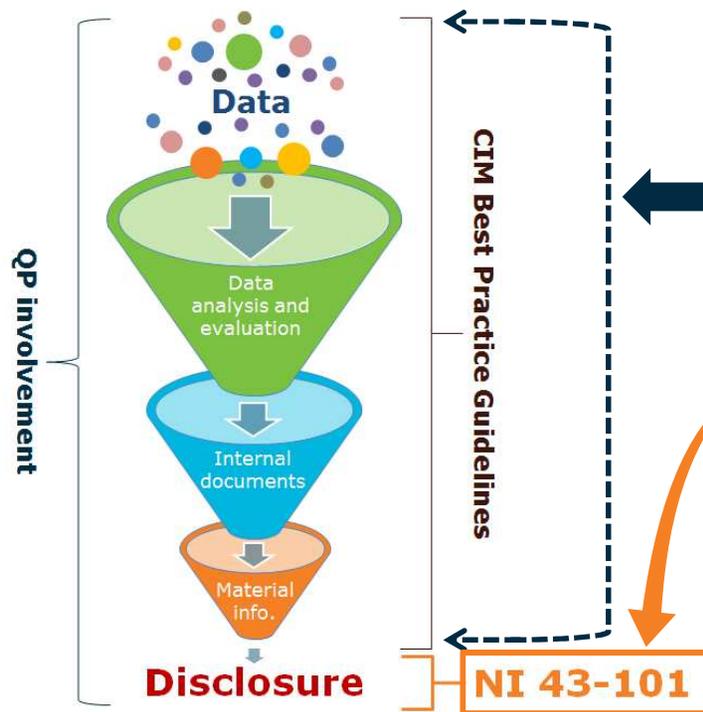
Misconceptions about technical reports

- ✘ *Technical reports are "approved" by the regulator before being publically filed on SEDAR*
- ✘ *The company has a "43-101" report, so it must be a good property*
- ✘ *The technical report is over 300 pages, so it must be an advanced property and close to production*
- ✘ *How could the project fail? – it had a "43-101" technical report!*

Remember:

- *NI 43-101 sets minimum standards for disclosure of technical information*
- *The QP is responsible for the methods, assumptions, and judgements used for verifying, interpreting, and reporting of the technical information*

Disclosure vs. state of practice



① **IF** a problem occurs up here with the **state of practice**

- Data quality
- Misinterpretation of information
- Not following best practice guidelines
- Unrealistic assumptions
- Resource estimation issues
- Overly optimistic mining study forecasts

② **THEN**, the problem shows up down here in the **disclosure** in the **technical report**

③ **BUT**, NI 43-101 can't fix problems with the **state of practice** – these problems need to be addressed by the **QP** before the disclosure is made

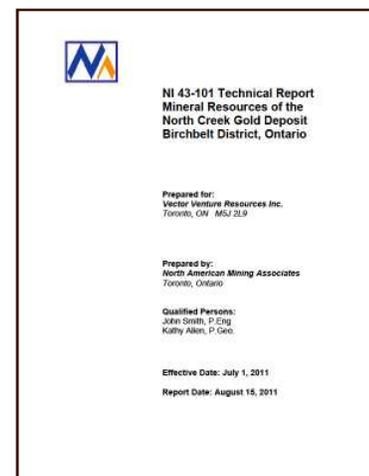
Process: Disclosure to filing a technical report

Disclosure

- New release
- MD&A
- AIF
- Offering document
- Website
- Presentation
- Social media
- etc.

Does the disclosure trigger a technical report?

If **YES**



“Milestones” trigger technical reports

Property Milestones

- First time disclosure of:
 - Mineral resource
 - Preliminary economic assessment
 - Mineral reserve
- Material change to any of the above

“Property success or revision triggers”

Company Milestones

- First time reporting in Canada
- Filing any of the following where the material technical information is not already supported by a current technical report:
 - Preliminary (long form) prospectus
 - Preliminary short form prospectus
 - (1st time or material change to MR/PEA/MR)
 - Information or proxy circular
 - Offering memorandum
 - Rights offering circular
 - Annual information form
 - Valuation
 - TSX Venture offering document
 - Take-over bid circular

“Company event triggers”

Mineral property with multiple deposits

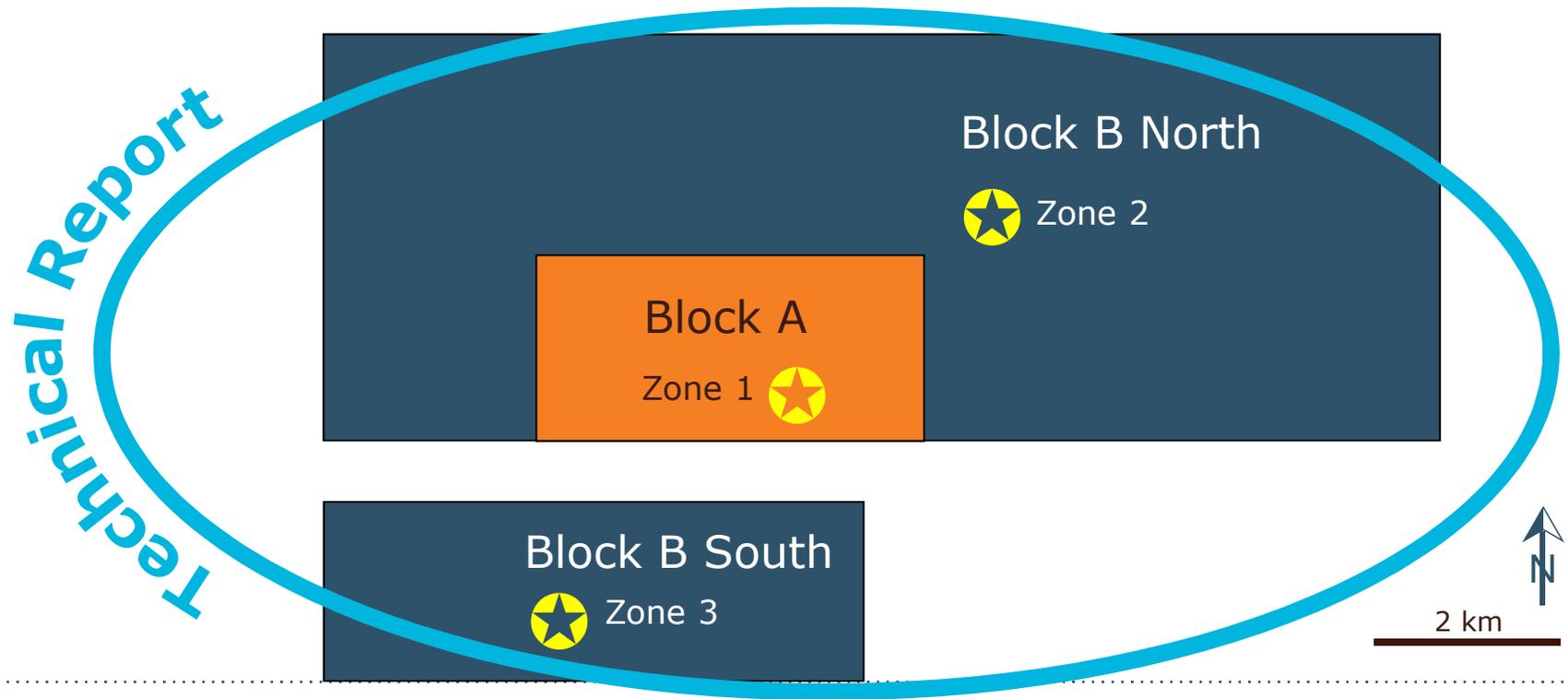
Can an issuer file separate technical reports for different deposits on the same mineral property?

- **No** (generally)
- Companion Policy says:
 - 1.1(6) - a “property” includes claims that are contiguous or in close proximity that any underlying deposits would likely be developed using **common infrastructure**
 - 4.2(8) - a technical report when filed must be complete and current and there should only be **one current technical report** on a property at any point in time

Determination generally depends upon:

- *Existing or proposed infrastructure (i.e. central mill)*
 - *How the issuer is reporting the potential development of the mineral deposits*
-

Example: Single technical report



How big should a technical report be?

- **General rule of thumb**

- Technical reports provide material information at a “summary-level”
- Disclosure should focus on what's important for the stage of development of the property
- Limit the pages of appendices

- **Observation**

- Average of 137 technical reports filed on SEDAR (April 2016 to June 2017)

Property Stage	Pages	Mb
Exploration (21)	94	5.3
Resource (36)	168	6.0
PEA (15)	240	7.0
Reserve (27)	354	12.6
Operating (38)	257	7.3

Independent technical reports



[s. 5.3]

- **ALL** QPs signing the technical report must be independent for the following triggering events:
 - First-time reporting issuer in Canada
 - Filing a preliminary long form prospectus
 - First time disclosure of a mineral resource, PEA, or mineral reserve
 - >100% change to an existing mineral resource or mineral reserve
- Exemption from independence for a “producing issuer”
 - Gross revenue > \$30 million in recent fiscal year; and
 - Gross revenue > \$90 million in last three fiscal years

Determining independence

- **Independence test [s. 1.5]**

- QP is independent if there is no circumstance that, in the opinion of a “reasonable person” aware of all relevant facts, could interfere with the QP’s judgment regarding the preparation of the technical report

- **Guidance** [Companion Policy]

- Interpreting the “reasonable person” test [1.5]
 - Provides a non-exhaustive list of situations where the QP is not independent
- Objectivity of the QPs [5.3(3)]
 - Staff may question the objectivity of the QPs
 - May ask for additional information, additional disclosure, or involvement of another QP

Self-assessment questions for the QP

- Would the vast majority of my peers agree with my logic in defining, classifying, and reporting the mineral estimates?
- Are my assumptions for eventual economic extraction reasonable and realistic?
- Have I considered approximate mining parameters and costs for reporting resource estimates?
- Would informed investors understand the assumptions, factors, procedures used?
- Does the project's stage of development reflect the level of confidence in the underlying data?
- Have I considered and used all representative data, and if not, have I considered the advantages and risks in not doing so?
- Have I applied realistic and justifiable mining and processing factors in determining the mine plan and schedule for reporting the reserve estimates?
- Have I adequately presented the significant areas of risk and uncertainty and potential ways that these could be addressed in future work and studies?

Modified from Mark Noppé - March 2014

Tips for QPs preparing technical reports

Top 10 tips

- ✓ Make sure you (the QP) have an appropriate amount of “relevant experience”
- ✓ Know the purpose of the technical report (*i.e.* triggering event)
- ✓ Setup a basic template for the technical report
- ✓ Use a checklist based on the disclosure requirements
- ✓ Use the current 2014 CIM Definition Standards
- ✓ Follow the CIM Best Practice Guidelines
- ✓ Review the guidance in the various CSA Staff Notices
- ✓ Write a concise and complete summary of the significant findings
- ✓ Clearly state the potential risks and uncertainties with the project
- ✓ Have the draft technical report **peer reviewed**

CIM guidance - Peer review and audit

- **CIM Best Practice Guidelines – Estimation of Resources and Reserves (2003)**
 - Peer Review
 - Best practice includes use of an internal peer review of the estimate including inputs, methodology, underlying assumptions, and the results of the estimate itself
 - Audits/Governance
 - Best practice includes completion of a properly scoped audit carried out by an impartial QP
 - Audit should consider the methodology, reasonableness of assumptions, and a review for conformity to the definitions and classifications
 - Audit should be documented in a manner that recognizes good corporate governance





Technical Report Common Disclosure Pitfalls

Regulators enforce disclosure requirements and have little or no effect on the results or outcomes of the technical report prepared by the QP

Form 43-101F1

(Note: Focus will be on bold items, but all are important)

Item 1: Summary

Item 2: Introduction

Item 3: Reliance on Other Experts

Item 4: Property Description and Location

Item 5: Accessibility, Climate, Local Resources, Infrastructure and Physiography

Item 6: History

Item 7: Geological Setting and Mineralization

Item 8: Deposit Types

Item 9: Exploration

Item 10: Drilling

Item 11: Sample Prep., Analyses and Security

Item 12: Data Verification

Item 13: Mineral Processing and Metallurgical Testing

Item 14: Mineral Resource Estimates

Item 15: Mineral Reserve Estimates

Item 16: Mining Methods

Item 17: Recovery Methods

Item 18: Project Infrastructure

Item 19: Market Studies and Contracts

Item 20: Environmental Studies, Permitting and Social or Community Impact

Item 21: Capital and Operating Costs

Item 22: Economic Analysis

Item 23: Adjacent Properties

Item 24: Other Relevant Data and Information

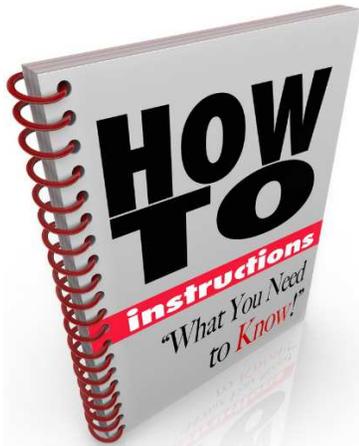
Item 25: Interpretation and Conclusions

Item 26: Recommendations

Item 27: References

*Note: Items **15-22** are required for a technical report on an **advanced property***

Don't forget to read the instructions



1. Objective of a technical report is to provide a summary of the material information about the mineral property
2. Look at NI 43-101 definitions and rules
3. Report should be understandable to a reasonable investor
4. Items 1 to 14 and 23 to 27 for all properties plus 15 to 22 for "advanced properties"
5. Each report replaces the previous report, may summarize existing information, but QP still takes responsibility
6. QP determines the level of detail necessary for the report
7. Limited disclaimers allowed for information by non-QP experts
8. Appendices may be used - but keep them short
9. Remember to sign and file the QP certificates and consents

Item 1: Summary

A key part of any technical report

- Briefly summarize the “key findings” relative to the property’s stage of development
 - Property description and ownership
 - Exploration and drilling status
 - Data verification and site visit
 - Mineral resource and reserve estimates (if applicable)
 - Mining studies and economic analysis (if applicable)
 - QP’s conclusions and recommendations

Observation by the regulator:

- *The summary section is usually about 5% of the total pages of a technical report*
-

Item 2: Introduction

Identifies the purpose and sets the framework of the technical report

- Terms of reference
 - Discuss objectives and scope of the technical report
 - Clearly state the purpose of the technical report (linked to the triggering event)
 - Identify the QPs involved and their responsibilities in the technical report
- Site visit
 - Who, when, and what was done during the site visit

Suggestion:

- *Consider a table to show the QP responsibilities and site visit dates*
-

Example: Table of QP responsibilities

Table 2: Qualified Persons

Company	Qualified Person	Site Visit	Responsibility
SRK	QP 1	July 6-10, 2015	Overall responsibility on behalf of SRK. Project Management (Executive Summary, Sections 1 to 11, 18, 21, 22, 23, 26, and parts of 24 and 25)
SRK	QP 2	June 16-18, 2014 December 14-16, 2016 November 8-9, 2017	Geology and Mineral Resources (Section 13, parts of 24 and 25)
SRK	QP 3	No Visit	Review of Processing and Recovery Method (Sections 12, 16, and parts of 20)
SRK	QP 4	December 14-16, 2016 November 8-9, 2017	Underground Mining and Mineral Reserves (Parts of Sections 14, 15, 20, 24, and 25)
Independent	QP 5	June 10-12, 2014 June 16-18, 2014 July 6-10, 2015 December 14-16, 2016 October 9-13, 2017	Open Pit Mining and Mineral Reserves (Parts of Sections 14, 15, 17, 20, 24, 25, and 26)
SRK	QP 6	No Visit	Environmental and Social and Permitting (Section 19)

Item 3: Reliance on other experts

Opinions of an expert for non-technical information

1. May rely on a report or opinion related to:
 - Legal, political, environmental, or tax matters
 - Identify:
 - Report, opinion, or statement
 - Date and author
 - Section of the technical report to which the reliance applies

2. May also rely on a report or opinion related to:
 - Valuations for diamonds and gemstones
 - Pricing for commodities where pricing not publicly available
 - Identify:
 - Qualifications of expert, potential risks and any verification by the QP

Example: Reliance on property title opinion

Mineral Tenure

"The QPs have not reviewed the mineral tenure, nor independently verified the legal status, ownership of the Project area or underlying property agreements.

The QPs have fully relied upon, and disclaims responsibility for, information derived from legal experts for this information through the following document:

Letter from Clark Wilson LLP titled XYZ Resources Ltd. – Mineral Claim Title dated October 29, 2017. Information from this letter has been used in Section 4 of this technical report."

Item 12: Data verification

The project's stage of development needs to reflect the level of data verification and confidence in the information

(eg. No data verification = No mineral resource estimate)

- Describe the data verification by the QP
 - Steps taken by the QP to verify the data used in the technical report
 - Any limitations on data verification, or failure to verify, and reasons why
 - QP's opinion on the adequacy of the data for the purposes used in the technical report

Example: QP's opinion on data verification

"Based on the data verification performed, it is the QP's opinion that the collar coordinates, downhole surveys, lithologies, and assay results are considered suitable to support the mineral resource estimation."

Example: Types of data verification

- **Database check**
 - Drill collar coordinates
 - Down-hole deviations
 - Lithology and alteration
 - Assay data
 - Error checks
- **Site visit due diligence**
 - Drill collar locations in the field
 - Logging and sampling facilities
 - Core storage
 - Inspection of drill core recovery and mineralization
 - Independent sampling, if appropriate
 - Laboratory visit, if appropriate

"Assume nothing ... check everything ... trust no one." Harry Parker, AMEC - May 10, 2004

Item 14: Mineral resource estimates

Mineral resource = “reasonable prospects of eventual economic extraction”

- Summarize
 - Key assumptions, parameters, and methods to determine resources
 - Comply with disclosure required by s. 2.2, 2.3, and 3.4
 - 2.2 - All disclosure of mineral resources and mineral reserves
 - 2.3 - Restricted disclosure
 - 3.4 - Written disclosure of mineral resources and mineral reserves
 - For metal equivalents - report the individual grades and assumptions used
 - Discuss any material factors that could affect the mineral resource estimates
 - Environmental, permitting, legal, title, socio-economic, political, other factors

Example: Key assumptions, parameters & methods

- **Assumptions**

- Cut-off grade and basis for its determination
- Commodity prices
- Mining and processing method
- Metallurgical recovery
- Costs related to mining, processing, and G&A

- **Methods**

- Ordinary kriging, inverse distance squared, polygonal, etc.

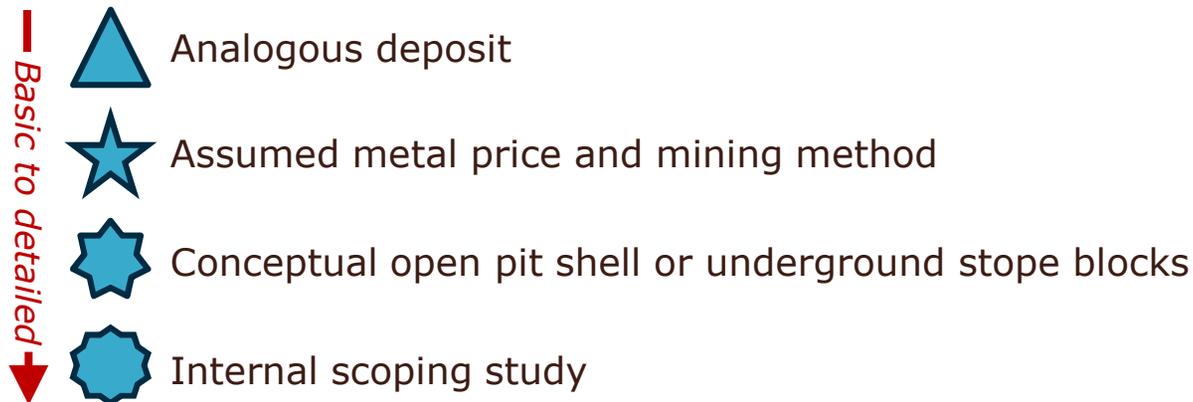
- **Parameters**

- Appropriate geological model for the deposit type
- Cutting factors
- Bulk density
- Search distances and minimum samples per block
- Interpolation distances and directions

Note: *The cut-off grade needs to reflect the assumed mining method*

Variation in “judgement by the QP”

- Observed basis used by QPs for determining that a mineral resource estimate has “reasonable prospects for eventual economic extraction”



Possible intervention by the regulator:

- May require the QP to provide additional disclosure about how they determined the mineral resource has “reasonable prospects for eventual economic extraction”

Example: Reasonable prospects assumptions

Assessing reasonable prospects for eventual economic extraction

To assess reasonable prospects for eventual economic extraction, an optimized pit shell was prepared using general technical and economic assumptions listed below to constrain the estimated resource blocks.

Technical and economic parameters for assessing reasonable prospects:

<i>Gold Price</i>	<i>US\$1,300/oz</i>
<i>Silver Price</i>	<i>US\$17/oz</i>
<i>Gold Recovery</i>	<i>85%</i>
<i>Silver Recovery</i>	<i>45%</i>
<i>Exchange Rate</i>	<i>US\$:C\$ 1 to 0.80</i>
<i>Mining Cost</i>	<i>\$1.50/tonne</i>
<i>Processing Cost</i>	<i>\$7.25/tonne</i>
<i>G&A Cost</i>	<i>\$1.05/tonne</i>
<i>Pit Slope</i>	<i>45 degrees</i>

What is a reasonable metal price?

CIM Guidance on Commodity Pricing in Resource & Reserve Estimation (2015)

- Consider the stage of development (resource vs. reserve vs. production)
 - Long term average (5 years or longer)
 - Consistent with peers (consensus pricing)
 - Contract price
 - Current price
 - Specialist reports (commodities with no published price)
- Observation by the regulator – commonly used standard
 - Lesser of the 3-year trailing average or current spot price



What does NI 43-101 say about using best practice guidelines?

- General Guidance (6) of Companion Policy 43-101CP
 - QP is not specifically required to follow the CIM best practices guidelines
 - However, a QP acting as a “professional”, will generally respect industry standard practices, as established by CIM or similar organizations in other jurisdictions
 - Issuer’s that disclose technical information not conforming to industry standard practices could be making **misleading disclosure**

Note:

- *Regulators may challenge an issuer's disclosure if it appears to deviate from published industry best practices*
-

Industrial/specialty mineral resources

Ex: Lithium, graphite, silica, etc.

CIM Best Practice Guidelines – Industrial Minerals (2003)

- Potential viability of an industrial/specialty mineral deposit differs significantly from a metallic mineral deposit in one key area - **marketing factors**
 - Mineral characteristics of the deposit must meet the demands of the market
 - Economic viability is significantly affected by factors such as:
 - Physical, chemical, and quality characteristics of the mineral
 - Size and concentration of the market
 - Transportation costs
- Driver of potential value is the “quality” of the deposit, not the tonnage, grade or amount of contained mineral

“Without a market, an industrial mineral deposit is merely a geological curiosity”

Peter Harben, Industrial Minerals Consultant

Use of an “acceptable foreign code”

Include in the technical report a reconciliation of “material” differences to the CIM Definition Standards [s. 7.1(2)]

Foreign Code	Country or Region
	Australasian (JORC Code)
	Europe (PERC Code)
	South Africa (SAMREC Code)
	Chile (Certification Code)
	United States (Industry Guide 7)
	Russia (NAEN Code)
<i>Any foreign code consistent with CRIRSCO</i>	Appendix A.1 of Companion Policy 43-101CP lists Additional Acceptable Foreign Codes (February 2016)

Items 16 to 22 for an “advanced property”

“Advanced property”: reserves (based on a PFS or FS), or resources and a PEA

16. Mining Methods
17. Recovery Methods
18. Project Infrastructure
19. Market Studies and Contracts
20. Environmental Studies, Permitting and Social or Community Impact
21. Capital and Operating Costs
22. Economic Analysis

Instruction for Items 16 to 22

- *PEA, PFS, and FS generally analyze and assess the same geological, engineering, and economic factors with increasing detail and precision*
 - *Items 16 to 22 can be used as a framework for reporting the results of all three studies*
-

3 types of technical and economic studies

Disclosure concerns



Criteria	Technical & Economic Studies		
Type of Study	Preliminary Economic Assessment (PEA)	Prefeasibility Study (PFS)	Feasibility Study (FS)
Concept	"What it <u>could</u> be"	"What it <u>should</u> be"	"What it <u>will</u> be"
Objective	Early stage conceptual assessment of the <u>potential economic viability</u> of mineral resources	Realistic economic and engineering studies sufficient to <u>demonstrate economic viability</u> and establish mineral reserves	Detailed study of how the mine will be built, used as the basis for a <u>production decision</u>
Cost Accuracy	+/- 30-50%	+/- 20-25%	+/- 10-15%
Contingency	35%	15%	10%
Engineering	0-5% completed	5-15% completed	15-50% completed
Mineral Estimate Inputs	Inferred/Indicated/Measured Resources	Indicated & Measured Resources	
Mineral Estimate Outputs	Inferred/Indicated/Measured Resources	Probable & Proven Reserves	

Caution: Generalized for presentation purposes. Based on SME and AACE.

CSA Staff Notice 43-307 on PEAs (Aug 16, 2012)



Canadian Securities
Administrators

Autorités canadiennes
en valeurs mobilières

CSA Staff Notice 43-307

Mining Technical Reports - Preliminary Economic Assessments

- Provides PEA guidance in seven areas:
 - **Misuse of a PEA as a proxy for a PFS**
 - **PEA done in conjunction with a PFS, FS, or LOM plan**
 - **PEA disclosure and technical report triggers**
 - Potentially misleading PEA results
 - PEA disclosure that includes by-products
 - Relevant experience of QPs
 - Consequences of disclosure deficiencies or errors

CIM guidance - Inferred in economic studies

CIM Definition Standards (2014)

- Guidance on inferred resources in publicly disclosed PFS, FS, and LOM plans reflects the prohibition on including inferred resources in these studies
 - **PFS or FS** must not include inferred resources in the:
 - Economic analysis
 - Production schedules
 - Mine life
 - **Developed mines** must not include inferred resources in the:
 - Life of mine plans
 - Cash flow models

Article: "Implementation of 2014 CIM Definition Standards" P. Bankes, Aug/Sep 2015, CIM Magazine

PEA after reserves – What is allowable?

1. Issuer takes a **step backwards**

- Entire project moves back to a PEA stage
 - May be due to new property ownership, new information, etc.
 - All reference to mineral reserves is removed from the disclosure

2. Issuer **re-scopes** an existing project

- Based on significant new information or a different production scenario
 - New discovery or deposit type on the same property
 - Change in mining or processing method
 - Change to infrastructure requiring significant capital investment
- **Clearly separate** the detailed mine design and economics (PFS or FS) supporting reserves (*Items 15-22*) from the conceptual mine design and economics (PEA) on resources (*Item 24*), and don't include reserves in the PEA

PEA after reserves – What is not allowable?

- **Don't!**

- Use the PEA to update, modify, or add to the PFS, FS, or LOM plan
 - Include mineral reserves in the PEA
 - Incorporate inferred resources into the same production profile, economic analysis, cash flow, or mine plan based on mineral reserves
 - Treat inferred resources as if they have the same confidence as mineral reserves
 - Treat the PEA as if it has the same detailed design and planning as the PFS, FS or LOM plan
- Two fundamental issues that need to be satisfied with any PEA after reserves
 - 1) CSA Staff Notice 43-307 - don't misuse the PEA!
 - 2) CIM's position - no inferred in the PFS and FS, or the LOM plan at a developed mine

The PEA is always disclosed as an independent and standalone analysis from the PFS, FS, or LOM plan

Item 20: Environmental studies, permitting and social or community impact

Water, tailings, and waste are critical areas of project risk

- Environmental and permitting - summarize
 - Environmental studies completed and issues that may materially impact extraction
 - Requirements for tailings disposal and water management
 - Project permit requirements and the status of permits
 - Requirements for reclamation bonds
 - Mine closure costs

"The public couldn't care less about our productivity levels and ROI. They absolutely do care what we do with our waste streams – waste water and solid waste. This is where our industry interacts with the public."

Douglas Morrison, CEO, Centre for Excellence in Mining Innovation (CEMI) - January 16, 2018

Item 20: Environmental studies, permitting and social or community impact

Obtaining and maintaining “social license” is critical for mineral projects

- Social or community impact - discuss
 - Potential social or community related requirements and plans for the project
 - Status of negotiations or agreements with local communities

BLACKROCK[®] 2018 letter to CEOs (BlackRock manages **\$6.3 trillion** in assets)

"Society is demanding that companies, both public and private, serve a social purpose. ... Companies must benefit all of their stakeholders, including shareholders, employees, customers, and the communities in which they operate."

Item 21: Capital and operating costs

Provide adequate context and justification for the estimated costs

- Summarize
 - Capital and operating costs with major components in tabular form
 - Explain and justify the basis for the cost estimates
- Remember s. 2.3(4) on use of the terms PFS and FS
 - Must only use the term prefeasibility study (PFS) or feasibility study (FS) if the study satisfies the criteria set out by the CIM Definition Standards

Approximate level of cost accuracy for each study: PEA \pm 30-50%, PFS \pm 20-25%, FS \pm 10-15%

Example: Basis for capital cost estimates

Table 21-3: Basis of Estimate Summary

Item	Estimate Basis
Equipment	
Major Equipment	Multiple budget quotations using general engineering specifications and data sheets based on the design criteria and process flow diagrams. Also includes single source pricing from select designated suppliers. Tank costs are based on quotes from equipment suppliers for specific CIC and ADR tanks, and/or steel take offs and steel prices using sizes specified in the design criteria.
Minor Equipment	Budget quotations based on brief specifications and/or process flow diagram information. Where quotations were not received costing used from previous similar projects was used.
Materials	
Concrete	Preliminary concrete quantities are estimated based on the GA drawings and experience with similar projects. A 5% allowance is added in the build-up for spillage and over pour. Unit rate costs are based on contractor quoted pricing from suppliers in Ontario. The concrete unit rates include batching costs, aggregate crushing and screening, rebar, forming, pouring and finishing. Structural backfill quantities were estimated by JDS using basic engineering and experience.
Structural Steelwork	Structural steel quantities are estimated based on the GA drawings and experience with similar projects. Unit rate costs for supply are based on budgetary quotations from steel fabricator in Ontario. Construction and erection hours are based on experience with similar projects.

Item 22: Economic analysis

Assumptions should be reasonable and defensible

- Provide
 - Clear statement of the main assumptions (a table is useful)
 - Cash flow forecasts on an annual basis for the life of the project
 - NPV, IRR, and payback (using a reasonable discount rate)
 - Taxes, royalties and government levies applicable to the project
 - Sensitivity analysis with a “reasonable range” using parameters significant to the particular project
- Instruction
 - “Producing issuers” may exclude the economic analysis for properties in production, unless a material expansion is planned

Economic analysis - Points to consider

Economic analysis should be prepared:

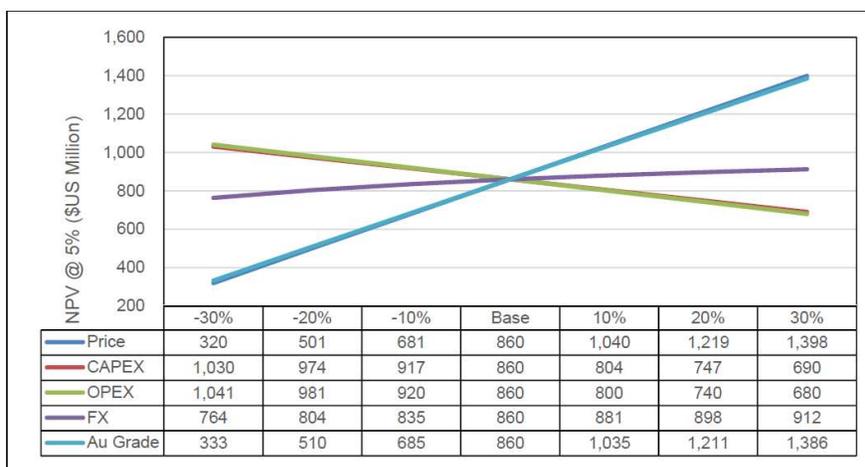
- On a project basis
 - No issuer specific provisions such as for tax losses, etc.
- On a 100% equity basis
 - Not a combination of debt and equity
- By considering the metal streaming contract price
 - If a Cu stream is in place for the Au project, use the contract Cu price, not assumed price
- Using a reasonable discount rate
 - Dependent upon commodity, project location, stage of development, etc.
- On a pre-tax and after-tax basis
 - Everyone pays taxes!

Extending the “shelf life” of a technical report

Guidance

- Companion policy [s. 4.2(7)]
 - Economic analyses are based on assumptions that can change over time
 - Economic and financial outcome information can quickly become outdated
 - The “shelf life” of the technical report can be extended by providing an appropriate sensitivity analysis of key variables:
 - Commodity price
 - Recovery
 - Capital and operating costs
 - Foreign exchange rate
 - Discount rate
 - Etc.

Figure 23.2: After-Tax NPV5% Sensitivities



Item 25: Interpretation and conclusions

Clearly communicate the project's material risks and uncertainties

- Summarize
 - Relevant results and interpretations
 - Significant risks and uncertainties that may reasonably affect the reliability or confidence in:
 - Exploration information
 - Mineral resource or mineral reserve estimates
 - Projected economic outcomes
 - Potential impacts of these risks to the project's potential viability or continued viability

Observation:

- *This is a critical step and may help the QPs identify "interconnected" risks*

Example: Risks and potential impacts (Mineral resources)

Table 69: Risk categories used

Risk Category	Definition
	Fatal Flaw (significant material risk to metal)
	Moderate (metal may be at risk)
	Low (unlikely to have material affect on metal)
	Insignificant (errors detected, but immaterial)
	Potential upside or opportunity

Table 70: Project Risk Table (Coloured by risk category)

Project	Balogo
Data Management System	Opportunity to improve on excel and passport-based data capture and storage, with a move towards more secure relational database structure to improve integrity and more efficiencies in data management, storage and security.
Geology	No digital geology data provided.
QAQC	Past QAQC failures has led to the exclusion of eight drill holes from the MRE database.
Artisanal Workings	No survey data for artisanal workings. Surface metal may be at risk.
Nature of Gold Mineralisation	Visible Au and extremely high grade Au mineralisation may be discontinuous. Close spaced grade control required.
Dry in-situ bulk density	Oxide and transitional density is not based on actual measured values, due to likely oversampling of competent material in core. This leads to uncertainty in the density values used for approx. 30% of the mineralisation, but based on CSA Global's experience, these values are unlikely to be too high.
Topography	Topography based on drill hole collars. Has had to be expanded for mine planning work. May place some oxide mineralisation at risk.

Table continued ...

QP certificate

Follow the requirements in s. 8.1(2) of NI 43-101

- The QP certificate must state information for (a) through (i)
 - a) QP's name, occupation and address
 - b) Technical report name and date
 - c) QP's relevant experience and professional association**
 - d) Site visit**, or not
 - e) Items of responsibility**
 - f) Independent**, or not
 - g) Prior involvement with property
 - h) Prepared in compliance with NI 43-101
 - i) Technical report is not misleading

Example: Relevant experience statement (Responsible for mineral resource estimate section)

- Deficient Example:

I have practiced my profession continuously since graduation from university in 1987.

- Better Example:

I have worked as a professional geologist for 30 years since graduation from university in 1987. My relevant experience for the purpose of the Technical Report includes:

- *Since 2006 - Consulting geologist specializing in mineral resource and mineral reserve estimation and audits for a variety of early and advanced stage precious and base metal projects in Canada, Africa, Chile and Mexico; and*
- *1995 to 2005 - Employed at several underground and open pit gold and copper mining operations in Canada and held positions of Mineral Resources Manager, Chief Mine Geologist and Chief Evaluation Geologist with the responsibility for estimation of mineral resources and mineral reserves for development projects and operating mines.*

Key staff notices for mining issuers

Date	Topic	Reference
Jul 22, 2011	Mineral Brines	OSC Staff Notice 43-704 <i>Mineral Brine Projects and NI 43-101</i>
Aug 16, 2012	Preliminary Economic Assessments	CSA Staff Notice 43-307 <i>Mining Technical Reports – Preliminary Economic Assessments</i>
Nov 9, 2012	Emerging Markets	OSC Staff Notice 51-720 <i>Issuer Guide for Companies Operating in Emerging Markets</i>
Feb 21, 2013	Foreign Professional Associations	CSA Staff Notice 43-308 (Revised) <i>Professional Associations under NI 43-101</i>
Jun 13, 2013	Forward Looking Information	CSA Staff Notice 51-721 <i>Forward Looking Information Disclosure</i>
Jun 27, 2013	Technical Reports	OSC Staff Notice 43-705 <i>Staff's Review of Technical Reports by Ontario Mining Issuers</i>
Dec 11, 2013	Non-GAAP Financial Measures	OSC Staff Notice 52-722 <i>Staff's Review of Non-GAAP Financial Measures</i>
Feb 6, 2014	Mining MD&A	OSC Staff Notice 51-722 <i>Review of Mining Issuers' MD&A and Guidance</i>
Apr 9, 2015	Website Investor Presentations	CSA Staff Notice 43-309 <i>Review of Website Investor Presentations by Mining Issuers</i>
Feb 25, 2016	Companion Policy 43-101CP	CSA Notice <i>Changes to Companion Policy 43-101CP</i>

How to improve compliance – review these:



Thank You!

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